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Reassessing the Architecture of the Health Beliefs Models in Low-Income Diverse Families

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REASSESSING THE ARCHITECTURE OF THE HEALTH BELIEFS MODEL IN LOW-INCOME DIVERSE FAMILIES

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Health beliefs contribute to health outcomes. These health beliefs extend to include health beliefs parents have regarding their children's health. However, the role of parental health beliefs remains unexplored among a low-income population. This study aims to assess these beliefs and the effects they have on child health. Furthermore, this study aims to delineate potential belief differences between socioecological-level groups (e.g. population density, Latino identification, and insurance coverage). The long-term goal is to understand the relationships among various personal health beliefs and parental health beliefs, psychosocial factors, community factors, cultural factors, organizational factors, and healthcare perceptions among this at-risk population. Results from this study can further inform public policy and public health procedures.

Dedication

To my father, William Highland, and grandmother, Violet Martin. The strongest individuals I know, and for that I am truly blessed to call them my family.

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Chapter 1: Introduction

Fourteen to thirty percent of American deaths result from preventable behaviors (e.g., cigarette smoking, obesity) (Krieger, Rehkopf, Chen, Waterman, Marcelli, & Kennedy 2008) and manageable conditions (e.g., asthma, diabetes) (Galea, Ahern, & Karpati, 2005). These preventable health behaviors have been demonstrated to be learned early in childhood (Moller, Traubert, Allen, Clark, & Lauer, 1994; Klesges, Klesges, Eck, & Shelton, 1995; Whincup, Gilg, Papacosta, Seymour, Miller, Alberti, et al., 2002), which presumably forms the foundation for a belief system (e.g. susceptibility to disease, severity of disease, perceived barriers to health behavior, perceived benefits of health behavior) that perpetuates poor health behavior and predicts premature death (Brewer, Chapman, Gibbons, Gerrard, McCaul, & Weinstein, 2007; Brewer & Fazakes, 2007; Painter, Borba, Hynes, Mays, & Glanz, 2008 ; Winfield & Whaley, 2002; Sedlak, Doheny, Estok, Zeller, & Winchell, 2007). Despite the wealth of information about how personal health beliefs influence health outcomes (e.g., Painter et al., 2008), a critical gap in knowledge relates to how these belief systems are formed and are passed down from one generation to the next.

The degree to which parental health beliefs influence the child's engagement in the health care system and the child's health behavior sets the stage for the generational transmission of poor health and premature death. Further, the present study targets economically disadvantaged families because extant research is suggestive of a generational influence by showing that low income adults and children both utilize preventative health care less, have worse health behavior, demonstrate poorer health outcomes compared to those with great economic resources (Ashiabi, 2008, Hughes &

Ng, 2003, Owens, Zodet, Berdahl, Dougherty, McCormick, & Simpson, 2008; Oakley & Rajan, 1993; Reading, 1997; Seccombe, 2000). Given that environmental (e.g. population density, internet access), psychological (e.g. perceived stress, healthcare stigmatization), and cultural factors are additional barriers to health care utilization and are associated with poor health behavior among economically disadvantaged (Larson & Fleishman, 2003; Machlin & Kirby, 2009; Nicholson, Gardner, Grason, & Powe, 2005; Ralston, Hirsch, Hoath, Mullen, Cheadle, & Goldberg, 2009; Bottonari, Roberts, Ciesla, & Hewitt, 2005; Gonzalez, Peyrot, McCarl, Collins, Serpa, Mimiaga, & Safren, 2008; Beach, Cooper, Robinson, Price, Gary, Jenckes, et al., 2004), a secondary aim tests the interplay among environmental, psychological and cultural factor with parental health beliefs on child health outcomes.

This study encompasses a wide range of health related factors. It outlines the current state of health disparities in the United States. From there, a theoretical model of health, the Health Beliefs Model (HBM), is applied in which health disparities can be understood (Hochbaum 1958; Rosenstock, 1974). The HBM has the utility of explaining various health-related behaviors, such as preventative, health-supporting, health-risk, treatment adherence, and healthcare utilization behaviors. The HBM in this study expands on prior applications of the HBM to include beliefs that parents have about themselves and their children, as well as various factors that have been shown to impact health. Overall, this research has the potential to provide several implications regarding health disparities among low-income families.

Health Disparities in the United States

Twenty-one percent of families live in poverty within the United States (US Census Bureau, 2000). Low-income families disproportionately suffer from poor health and premature mortality (Adler & Newman, 2002). Low socioeconomic status (SES) has been associated with several vulnerabilities that may predispose a person to poor health outcomes. Individuals with lower SES report lower levels of perceived control, self-efficacy, and self-esteem (Turner, Lloyd, & Roszell, 1999; Twenge, & Campbell, 2002). Persons of low SES have also demonstrated to perceive themselves as having lower physical functioning, poorer general health, and poorer mental health (Gallo, Smith, & Cox, 2006).

Persons below the 40th percentile of household income have significantly higher odds of experiencing a greater amount of stressors and a decline in health status across two years compared to those above the 80th percentile (Orpana, Lemyre, & Kelly, 2007). Further analyses from this study showed that stressors explained 16% and 10% of the relationship between the lowest and 2nd lowest income quintiles and decline in self-related health (Orpana, et al., 2007). Low-income persons are less likely to have health insurance, a specific source of ongoing care, or a usual primary care provider (AHRQ, 2010). Income-related differences in quality of care persist despite the presence of health insurance coverage (Brown, Gross, Gutierrez, Jiang, Shapiro, & Mangione, 2003).

Ethnic health differences have been verified to be unduly diverse. Latino children are two to four times more likely to suffer from chronic physical and mental health problems (Bazargan, Calderon, Heslin, Mentes, Shaheen, Ahdout, et al., 2005). Studies have demonstrated that individuals of a minority group suffer more from disease,

diabetes, asthma, cancer, and other conditions than their majority counterparts (HHS, 2003). However, Latinos are less likely to smoke cigarettes (HHS, 2010), which is a leading cause of mortality within the United States (HHS, 2003). The etiology of these disparities has stemmed from lower income status, lower education level, higher occupational hazards, and higher environmental hazards (Williams, 1990; Pincus, Esther, DeWalt, & Callahan, 1998; Pincus, & Callahan, 1995). Contributing to this gap, lack of insurance has been shown to be more prevalent among US minorities. For example, Latinos represent 13% of the total US population, but 25% of those without health insurance (Census Bureau, 2000).

Lack of health insurance creates effects such as decreased preventative healthcare access, higher rates of emergency department and avoidable hospitalizations, and lesser access to prescription medications (Andrulis, 1998; HHS, 1998). Despite access to government-funded services covered by Medicare, persons of minority groups still access healthcare services (i.e. immunizations and mammograms) less than their majority counterparts (Gornick, Eggers, Reilly, Mentnech, Fitterman, Kucken, et al., 1996). Even after controlling for socioeconomic status and health insurance status, a review study concluded that racial/ethnic disparities occur in the diagnosis and treatment of various conditions (Institute of Medicine, 2002).

The Health Belief Model

Within the present study, the broader framework of the Health Belief Model (HBM) is applied to examine the influence of parental health beliefs on child health outcomes. HBM has been proposed as an empirically-supported structure to examine the role of health beliefs in the development and maintenance of poor health behaviors

(Rosenstock, 1974). This model proposes that health behaviors are influenced by four cardinal health beliefs: perceived likelihood of illness, perceived severity or illness, perceived benefits from behaviors, and anticipated barriers to behavior engagement (Rosenstock, 1990; Rosenstock, Strecher, & Becker, 1994).

The foundation of the HBM is rooted in value-expectancy concepts (Strecher & Rosenstock, 1997) in which value is the desire to avoid illness or get well and expectation is the belief that a specific health behavior would prevent illness (Strecher & Rosenstock, 1997). Expectancy was extended to include one's perception of personal likelihood of, and severity of, an illness, as well as the likelihood of being able to reduce this susceptibility through behaviors (Strecher & Rosenstock, 1997). Originally developed in the 1950's by U.S. Public Health Service researchers, the HBM aimed to explain the mass failure of public participation in disease prevention and detection programs (Hochbaum 1958; Rosenstock, 1974). The earliest HBM application explored factors contributing to the lack of participation in free, mobile tuberculosis screening programmes (Hochbaum, 1958). Analyses derived from more than 1200 adults across three cities revealed that perceived likelihood of tuberculosis and perceived benefits of the screening predicted subsequent voluntary X-ray screenings (Hochbaum, 1958).

In the decades to follow, the HBM expanded its applicability to include a variety of health behaviors and illness conditions. Since its formulation, the HBM has assessed screening behaviors such as influenza inoculations, practice of breast self-examination, and attendance at screening programs for Tay-Sachs carrier status, high blood pressure, seat-belt use, exercise, nutrition, smoking, and check-up visits. Kirscht (1974) and Becker (1974) widened the model's utility by examining people's responses to symptoms and

illness diagnoses (sick-role behaviors). Examples have included the examination of compliance to regiments related to hypertension, diabetes, end-stage renal disease, medication, and weight loss (Stretcher & Rosenstock, 1997). These studies will be more thoroughly outlined in the following sections. Each component of the HBM represents a distinct and unique factor that contributes to one's health-related behaviors. The components are as follows:

Barriers. Barriers are any factors that may prevent or hinder an individual from taking a particular health action (Strecher & Rosenstock, 1996). These barriers can be divided into two classes, practical barriers (i.e. time-consumption of the health behavior, difficulty in obtaining access to healthcare) and consequential barriers (fear of treatment effects, uncertainty regarding where to go after a screening procedure results in the presence of a disease) (Nijhof, ter Hoeven, & de Jong, 2008). Perceived barriers have been identified as the most powerful single predictor of the four HBM factors across all studies and behaviors (Stretcher & Rosenstock, 1997).

Benefits. Benefits is conceptualized as the anticipated gains resulting from a course of action that will be beneficial to reducing one's likelihood of or the severity of the condition (Rosenstock, 1990). Benefits can be both psychological (i.e. exercise makes me feel more self-confident) or physical (i.e. exercise helps me sleep better at night). This factor has been identified as being a stronger predictor when assessing sick-role behaviors (Stretcher & Rosenstock, 1997).

Likelihood (Susceptibility). This factor refers to one's personal perception of contracting a health condition. Post-diagnosis (i.e. person has been diagnosed with Type II Diabetes), this factor has been modified to include one's acceptance of the diagnosis,

personal estimates of curability, and likelihood of illness in general. Susceptibility has demonstrated to be a stronger predictor of preventative health behaviors (Stretcher & Rosenstock, 1997).

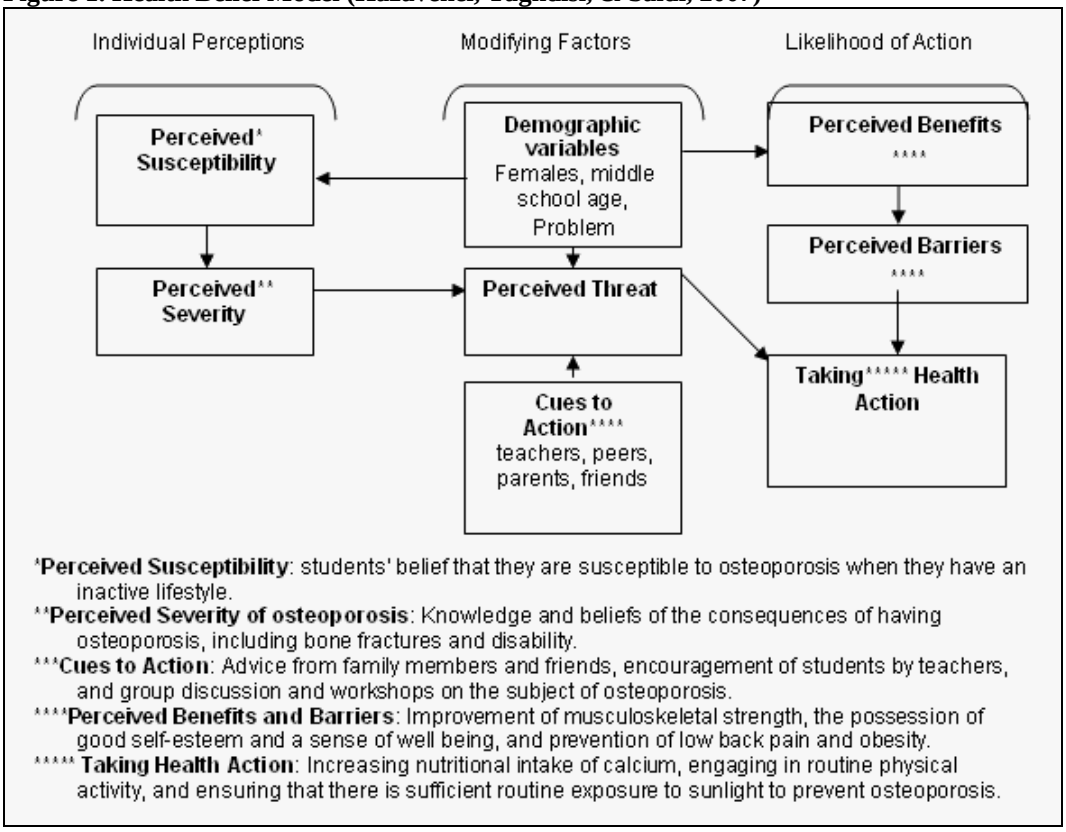
Severity. Severity concerns one's measure of illness seriousness if left untreated. This includes the evaluation of medical/clinical consequences (i.e. death, pain) and social consequences (i.e. effects on family and job life). When combined with susceptibility (likelihood), this summed term can be defined as the "perceived threat." Though severity has demonstrated to be the least powerful predictor within the HBM, it has been shown to be strongly related to the sick-role behaviors (Stretcher & Rosenstock, 1997).

Other components have been found to contribute to explanation of health behaviors, such as cues to action and self-efficacy (Rosenstock, et al., 1994). However, the empirical validity of this component is less supported. When tested among an African-American sample, cues to action and self-efficacy components did not significantly change the predictive capabilities of the HBM in predicting condom use (Winfield, et al., 2002).

Prior research has successfully applied the HBM to predict health behaviors across several diseases and conditions among adults (Janz & Becker, 1984; Rosenstock, et al., 1994, Connor & Norman, 1996; Painter, et al., 2008). Specifically, the model has been applied to cancer support group participation (Sherman, Pennington, Simonton, Latif, Arent, & Farley, 2008), chronic disease management (Clark & Becker, 1998), adult physical activity practices (Juniper, Oman, Hamm, & Kerby, 2004), vaccinations (Brewer, et al., 2007; Brewer, et al., 2007), HIV prevention (Winfield, et al., 2002), and osteoporosis prevention (Sedlak, et al., 2007). Variance accounted for ranges given the

focus of the research. For example, a HBM accounted for 21.1% of the variance between compliers and dropouts in a 6-month cardiac rehabilitation program. The HBM has also been shown to account for the variance of intention to (56%) and behavior of (21%) testicular self-examinations (McClenahan, Shevlin, Adamson, Bennett, & O'Neill, 2007) as well as 21% of the variance in breast self-examinations (Mikhail & Petro-Nustas, 2001).

Figure 1. Health Belief Model (Hazavehei, Taghdisi, & Saidi, 2007)



Outcomes Associated with the HBM

Preventative Health. Research has demonstrated the utility of the HBM in predicting preventative health behaviors. For example, the model has demonstrated that greater perception of psychological barriers (i.e. embarrassment, fear, and anxiety regarding Pap screening pain), and physical barriers (i.e. economic and time factors and language problems) predict lesser engagement in cervical cancer screening behaviors

(Lee, 2000; Jirojwong, MacLennan, & Manderson, 2001; Austin, Ahmad, McNally, & Stewart, 2001; Byrd Peterson, Chavez, & Heckert, 2004; Byrd, Chavez, & Wilson, 2007). Whereas greater perceived benefits of early cancer detection have been demonstrated to predict engagement in mammography (Domeighetti, D'Avanzo, Egger, Berrino, Perneger, Mosconi, & Zwahlen, 2003) and prostate cancer screenings (Tingen, Heydet, Boyd, & Weinrich, 1998). Preventative behavioral response to a less salient disease, West Nile Virus via mosquito, has demonstrated to be related to the HBM. Persons practicing mosquito avoidance behavior, using DEET-based mosquito repellent, and eliminating standing water were less likely to perceive barriers to action. Persons practicing mosquito avoidance behavior also reported greater likelihood of West Nile Virus beliefs (Aquino, Fyfe, MacDougall, & Remple, 2004).

The HBM has been successfully applied to predict vaccination behaviors. Among a sample of 299 Israeli nurses, the decision to obtain a flu immunization was predicted by the perceived benefits of the vaccination and cues to action. Furthermore, nurses who had received a flu vaccination reported greater levels of perceived severity and likelihood of influenza (Shahrabani, Benzion, & Yom Din, 2009). Similarly, elderly persons who perceived greater benefits, greater severity, and lesser barriers were more likely to have received a flu immunization (Nexoe, Kragstrup, & Sogaard, 1999). In a separate study of UK adolesencets older than 16 years, all four factors of the HBM (susceptibly, severity, benefits, barriers) were shown to significantly predict HPV vaccination acceptability (Marlow, Waller, Evans, & Wardle, 2009). When applied to hospital employees' hepatitis B vaccination behavior, beliefs about the safety and efficacy of the vaccine influenced vaccination engagement the most, demonstrating a lesser degree of perceived barriers.

However, these results also found that beliefs concerning likelihood and severity did not predict vaccination (Bodenheimer, Fulton, & Kramer, 1986).

Health Behaviors. Further studies have drawn knowledge to the implementation of the HBM on engagement in both positive and negative health behaviors. Focus groups with persons of varying yoga engagement reflected that though all persons reported benefits, persons who had never practiced yoga perceived greater barriers than benefits. Prior positive experiences with yoga and yoga instructors facilitated practice (Atkinson & Permuth-Levine, 2009). Sullivan and colleagues found that among an older population (average age of 74.8), persons at risk for stroke were more likely to have intentions to exercise when they perceived benefits of doing so (2008). A separate multinational study found that one's consumption of functional breads (*cholesterol lowering* and *added fiber* grains) was predicted by perceived benefits of and barriers to eating these foods, whereas perceived likelihood and perceived anticipated severity failed as predictors. This study also found that young consumers were more interested in the functional bread that claimed to promote health, rather than reduce risk of disease, whereas older consumers held the opposite belief (Vassallo, Saba, Arvola, Dean, Messina, Winkelmann, et al., 2009).

In regards to negative health behaviors, the HBM has been applied to examine correlates of desire and plans to quit smoking among 248 young, low-socioeconomic status African American women. Increased perceptions of severity (i.e. health concerns), barriers, (i.e. smoking for pleasure and smoking to relieve negative emotions), and personal likelihood predicted both desire and plans to quit. However, perceived severity

of lung cancer predicted only a desire to quit smoking, and not plans to do so (Manfredi, Lacey, Warnecke, & Petraitis, 1998).

Treatment Adherence. One of the strongest predictors of favorable treatment outcomes is adherence to prescribed treatment (DiMatteo, Giordani, Lepper, & Croghan, 2002). Health beliefs have been shown to impact predict such adherence. Misguided and positive parental beliefs in complementary and alternative medication to treat their child's asthmas have been significantly associated with greater risks for nonadherence and poorer asthma control (Adams, Murdock, & McQuaid, 2007). A small study of 18 parents whose children were receiving highly active antiretroviral therapies for the treatment of pediatric HIV infection demonstrated that greater perceived barriers to medication adherence (i.e. taste and number of medications) predicted lower adherence. Moreover, when treatment regimen effected day-to-day life, adherence lowered further (Goode, McMaugh, Crisp, Wales, & Ziegler, 2003).

Research examining the effects of medical equipment improvements on adherence to an obstructive sleep apnea treatment found that even after all identified barriers to a Continuous Positive Airway Pressure (CPAP) device were made, lessening and removing many of the side effects, the corresponding rates in adherence were to proportional to the reduction of side effects (Haniffa, Lasserson, & Smith, 2004; Malhotra, Ayas, & Epstein, 2000; Patel, White, Mallhotra, Stanchina, & Ayas, 2003; Perlis & Lichstein 2003). These findings demonstrate that even when mechanical barriers are removed, a person's pattern of adherence may not increase. When measuring CPAP adherence utilizing the HBM, perceived barriers (r=-.35) were shown to have a similar

strength to perceived benefits (r=.32), whereas likelihood (r=.10) and severity (r=.15) showed lesser relational strengths (Sage, Southcott, & Brown, 2001).

Healthcare Utilization. Components of the HBM have demonstrated some success in predicting which parents will utilize healthcare for their children. Both parents of 295 preschoolers responded to questionnaires regarding parental beliefs of ADHD behaviors, including the severity and impact of such behaviors. The half of parents who reported ADHD behaviors in their own child, also were more likely to perceive these behaviors as being less severe and less negative impactful on the family, compared with parents who did not report such ADHD symptoms. This study demonstrates that beliefs can be counterintuitive to behaviors, perhaps due to a sense of adaptation or minimization of the behaviors (Maniadaki, Sonuga-Barke, Kakouros, & Karaba, 2007).

In regards to cancer support groups, literature demonstrates that these supplementary treatments are grossly underemployed (Gilbar & Neuman, 2002). When studied within a HBM framework, Sherman and colleagues demonstrated insight into this underutilization (2008). Their analyses found that the small percentage of participants who participated in support groups perceived greater illness severity, greater benefits, and fewer barriers (Sherman, et al., 2008).

Parent to Child Health Transmission

The application of a child model in intervention strategies addressing the health beliefs of children sample has proven to be less successful. Though interventions may change health beliefs of a child, they do not produce tangible behavioral effects (Clark et al., 1988, Weisenberg & Kegeles, 1980). Children begin to become autonomous when entering adolescence and therefore, the model may present applicability to an adolescent

sample. The model demonstrated success among Iranian female middle school students (average age 14), in that an HBM-based osteoporosis prevention intervention resulted in greater perceived susceptibility, severity, and benefits of reducing risk factors and taking health action (Hazavehei, Taghdisi, Saidi, 1997). It is plausible that a qualitative period of intervention occurs prior to adolescence and occurs via parental imprinting. Meaning, parents are the vehicles of their children's health behavior until the children gains greater autonomy.

One cardinal example of this, the cycle of familial obesity, highlights parent-to-child health transmission. Children of obese parents are five times more likely to become obese as adults than those with normal-weight children (Lake, Power, & Cole, 1997). Though studies indicate sizeable genetic determinates of obesity (Maes, Neale, & Eaves, 1997; Koeppen-Schamerus, Wardle, & Plomin, 2001), researchers have turned to study the mechanisms between a genotypic vulnerability and a phenotypic expression (Faith, Johnson, & Allison, 1997). Meaning, genes alone do not guarantee subsequent obesity; the environmental context creates the means for gene expression; approximately 25% of the variance of weight is accounted for by environmental factors (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). In a longitudinal twin study of 428 children, children with overweight or obese parents had higher preferences for fatty foods, lower liking for vegetables, were more likely to engage in an 'over-eating' type, and preferred sedentary activities and pastime (Wardle, Guthrie, Sanderson, Birch, & Plomin, 2001). These findings illustrate that a child's genetic vulnerability to obesity (as indicated by parental obesity) presumably occurs, in part, via poor food and activity preferences.

Therefore, parental health beliefs about their children's health appear to be the primary influence on the establishment of the child's behavior, and thus be transmitted from parent to child. Within a sociocultural framework, parents are seen as mediators of their children's socialization process, meaning, they filter cultural and psychological beliefs before passing them across generations (Kozulin, 2003). Parents also determine the level of a child's autonomy, therefore allowing children to increasingly engage in the behaviors of their own choice. Among a low-income population, this has demonstrated to occur more often among lower socioeconomic status families, and that these children often had poorer health based on being allowed to select their foods and bed times. (Roden, 2004).

In prior decades, researchers have applied a parental health beliefs model: parental adherence to a rheumatic fever regimen (Gordis, Markowitz, & Lilienfeld, 1969), parental adherence to Otitis media treatment (Becker, Drachman, & Kirscht, 1972; Charney, Bynum, & Eldridge, 1967), parental adherence to a pediatric asthma regimen (Becker, Radius, & Rosenstock, 1978), parental adherence to a pediatric obesity regimen (Becker, Haefner, Kasl, Kirscht, Maiman, & Rosenstock, 1977), and physician visits (Kirscht, Becker, Haefner, & Maiman, 1978). More recently, the application of a parental health beliefs model has seen a resurgence; though the scope of these studies are limited to specific health behaviors and risks, as well as limited in the discernment of group differences. Furthermore, these studies often lacked diverse participant samples.

Studies indicate that some parental health beliefs are related to healthcare utilization and healthcare seeking behavior, though results are mixed. Increased healthcare utilization has been reported for children whose parents reported greater levels

of beliefs regarding their child's likelihood of illness (Fiegelman, Duggan, Bazell, Baumgardner, Mellitis, & DeAngelis, 1990, Maiman, Becker, & Katlic, 1986**,** Spurrier**,** Sawyer, Staugas, Martin, Kennedy, & Steiner, 2000). Whereas, among parents at two private pediatric practice, there were no significant differences in parental health beliefs among parents with immunized and non-immunized children (Taylor & Cufley, 1996). Most recently, a parental HBM examined HPV vaccination of adolescent females across North Carolina. Perceived barriers were the strongest predictor of HPV vaccinations, with researchers concluding few notable differences between racial groups (Black or White) and urban/rural status groups. For example, perceived barriers to getting their daughters an HPV vaccine was strongest for urban parents, but was not statistically significant among rural parents (Reiter, Brewer, Gottlieb, McRee, & Smith, 2009).

The use of a parental HBM has been used to measure adherence to their child's recommended treatment. For example, the parental HBM has found to predict approximately 30% of variance in compliance rates for prophylactic penicillin for 50 mothers with children diagnosed with sickle cell disease; barriers to adherence was the strongest predictor of compliance (Elliott, Morgan, Day, Mollerup, Segal, & Wang, 2001. After assessing parents waiting for their children to be seen in emergency rooms, results demonstrated that higher perceived barriers, higher perceived benefits of care, and public insurance status predicted higher emergency room utilization (Soliday et al., 2001). In separate analyses, these researchers also demonstrated that barriers, severity, and susceptibility predicted several post-emergency room discharge adherence behaviors (Soliday & Hoeksel, 2000). And when examining adherence to injury prevention measures, parental preventative behaviors were most strongly associated with high

benefits beliefs (Peterson, Farmer, & Kashani, 1990). Overall, no study to date has examined the relationship between personal and parental health beliefs. Furthermore, no study to date has examined the architecture of HBM in differing socioecological levels.

More recently, Anthony, et al. found that among parents with children receiving rheumatology and pulmonary care, increased parental perceptions of child vulnerability to illness were predictive of social anxiety in their children, even after controlling for the child's age and disease severity (2008). Parents with less education had increased perceptions of child vulnerability and their children missed school more often. (Anthony, Gil, & Schanberg, 2008). These studies demonstrate that beliefs regarding the child's health are impactful not only in terms of healthcare that the child receives, but also the psychological latent effects that manifest. A small study of 30 parents of children receiving antiretroviral treatment for pediatric HIV failed to demonstrate a significant relationship between parental beliefs of susceptibility and barriers with adherence to treatment (Steele, Anderson, Rindel, Dreyer, Perrin, Christensen, et al., 2001).

Prior research has supported the notion that non-health related beliefs of parents predicted both their children's further behavior and beliefs. For example, children's mathematical performance and achievement-related beliefs and motivation have been tied to their parents' beliefs (Entwisle & Alexander, 1990; Galper, Wigfield, & Seefeldt, 1997; Hunsinger, Jose, Liaw, & Ching, 1997; Frome & Eccles, 1998; Stevenson & Newman, 1986). Furthermore, achievement related beliefs and behaviors have resulted in better school performance (Aunola, Nurmi, Lerkkanen, & Rasku-Puttonen, 2003; Chapman & Turner, 1997; Mujis, 1997). When applied to alcohol use, Madon and colleagues found that parent's beliefs predicted the greatest degree of confirmatory

behavior from children when parents' estimations of their child's alcohol use was overestimated, suggesting that negative self-fulfilling prophecy beliefs may be more impactful to the outcome of child's future behavior (2004). Parallel research finds that parental interpretations of threat are significantly related to their children's interpretation of threats (Creswell & O'Connor, 2006). When applied to the area of familial health, these results indicate that parental beliefs regarding a child's health can impact the health of the child, and fuel the development of a child's health belief system via the internalization of the parents' health beliefs.

This relationship between adult and child health can specifically be assessed in the study of parent-to-child transmission of one of the most impactful and growing problems in the United States, childhood obesity (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010; Troiano, & Flegal, 1998). Obesity has been shown to result from overconsumption of caloric energy and under-engagement in energy expenditure (Kumanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002). Explorations of childhood predispositions to obesity has found that taste preference and eating habits develop when people are relatively young (Birch, 1999), this is especially important considering that the most important factor for predicting food selection among adults (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). Assisting in this development, parents establish food decisions for their very young children (Nicklas, Baranowski, Baranowski, Cullen, Rittenberry, & Olvera, 2001) and early eating experience (Birch & Fisher, 1998). Parental attitudes and behaviors determine food choices, meal timing, portion sizes, and social context of meals (Birch & Fisher, 1995). Despite a wealth of information regarding parental food choices and children's subsequent health, it is

unknown how factors of the HBM impact these relationships. Specifically, it is unknown how parental health beliefs and personal health beliefs impact a child's health among a low-socioeconomic population.

Changing parental attitudes and behaviors about healthy eating and exercising resulted in healthier behaviors among their children (Golan, Kaufman, & Shahar, 2006). Conversely, parents of overweight children are substantially less concerned about the severity of their child's health risk (Eckstein, Mikhail, Ariza, Thomas, Millard, & Binns, 2006). In addition, parental health beliefs have been linked to a child's adherence to a medication regiment (Conn, Halterman, Lynch, & Cabana, 2007) as well as the receipt of preventative care (Hughes & Wingard, 2007). Extant research, generally, supports the notion that parent's beliefs about health are essential to the development of lifelong health behaviors of their children. Given that low-income families appear to be vulnerable to the perpetuation of poor health across generations (Parsons, Power, Logan, & Summerbell, 1999; Boney, Verma, Tucker, & Vohr, 2005) and underutilization healthcare (AHRQ, 2010) until they need more costly emergency interventions (Oster & Bindman, 2003), the extent to which such parental beliefs negatively impact children of low income families is an important and relatively unexplored direction.

The present study applies a social learning perspective to the Health Belief Model (Janz, et al.,1984) by proposing that parental health beliefs are a key element to a child's behavioral development (e.g., Mansour, Lanphear, & DeWitt, 2000). More specifically, parents are the primary learning source for their children and provide a template of health-related behaviors that is assimilated by their offspring. Parental health and the health of their offspring have been shown to be strongly related, including exercise

behaviors, fat intake, smoking behaviors, and alcohol consumption. Furthermore, the effect parental health behaviors did not decrease as the their child's age increased (Rossow & Rise, 2002). The focus of the present study postulates that identifying the link between parental health beliefs and children's health behavior would implicate an important and discrete developmental point that precedes the assimilation of a child's own health beliefs and could be targeted for primary prevention efforts meant to break the cycle of poor health from one generation to the next.

The Influence of Psychological, Cultural, Environmental, and Organizational Factors

Though health beliefs exist within an individual, influences from the surrounding environment impacts health beliefs, and thus health behaviors of an individual. The socioecological model (Figure 2) accounts for the evolving changes of an individual's health behaviors based on changes and factors occurring at various layers of a person's context: interpersonal, organizational, community, and public policy levels (Green, Richard, & Potvin, 1996; Richard, Potvin, Kishchuk, Prlic, & Green, 1996; Sallis & Owen, 1997). This study proposes that factors from various socio-ecological levels will impact health beliefs and health behaviors as tested by the HBM. Changes to an individual's health behaviors can result by changing factors occurring at each level. Between the individual and interpersonal level, parental health beliefs bridge the link between individual health and familial health. The socioecological perspective provides several benefits. First, it allows researchers to determine the influence of a large environmental influence (i.e. public policy that increases taxes for cigarette purchases) on an individual's subsequent health behaviors (i.e. reduction in smoking behavior). Second, the socioecological model allows researchers to examine multiple overarching influences

of a person's health behaviors, and the interaction of these influences (Hanni, Mendoza, Snider, & Winkleby, 2007).

Increasing our knowledge of the influence of parental health beliefs on their children's health is relative to differences in psychological, cultural and environmental factors. In accordance with the socioecological perspective, differences of these factors will have profound influences on the parent-child relationship and consequential health. Therefore, research focused on the effects of psychological, cultural, and environmental factors will be further discussed in detail.

Figure 2. The Socioecological Model of Health Behavior

*From Caprio, et al., 2008

Psychological: Individual Level. Emotional factors have been shown to play a role in one's health. Higher levels of perceived stress (Bottonari, et al., 2005), depression (Gonzalez, et al., 2008; Egede & Ellis, 2008; Gonzalez, Safren, Cagliero, Wexler, Delahanty, Wittenberg, et al. 2007), and social anxiety (Kowalski & Brown, 1994) have demonstrated lesser engagement in positive health outcomes. Evaluations of treatment factors such as opinions regarding the relationship with the physician (Van Til, MacQuarric, & Herbert, 2003), dissatisfaction with clinic waiting times, and perceptions

of healthcare staff (Somkin, McPhee, Nguyen, Stewart, Shema, Nguyen, et al., 2004) have also been found to play a role. Persons of low-income, regardless of race, reported greater communication problems than those of higher socioeconomic status (AHRQ, 2009).

When applied to health behaviors, affective, mood, and emotional states have been shown to play a critical role in one's engagement in a health behavior. Mood and emotions are affective states. Emotions tend to be specific in their focus, whereas mood tends to be more diffused. Emotions and affects are viewed as being more reactionary, whereas moods tend to be more prolonged (Batson, Shaw, & Oleson, 1992). Broad reviews have shown positive health effects associated with greater positive affect, and negative health effects associated with greater negative affect and distress (see Pressman & Cohen, 2005; Watson & Pennebaker, 1989; Watson, 1988). Furthermore, this relationship has been demonstrated to be a mediator of the effects of cognitively based decision-making factors and as an independent factor of engagement in a health behavior (Kiviniemi, Voss-Humke, & Seifert, 2007). Prior critiques of the HBM have indentified that there is an absence of consideration of affect as an influence on health behavior (McCaul & Cullens, 2003). Previous studies applying a HBM did not examine the effect of mood, affective states, and distress. Given the extensive prior research indicating the role of affect, stress, and mood, this study aims to assess psychological variables to overcome this limitation by examining the role of a depression screening question examining negative mood, prior anxiety and depression diagnoses, as well as perceived stress.

Cultural: Interpersonal Level. Quality of care and health behaviors have shown racial and ethnic disparities, and not explained fully by differences in access, clinical appropriateness, or patient preferences (Beach, et al., 2004). For example, perception of barriers to flu vaccinations have demonstrated to be culturally different. Whites and African Americans reporting greater concern for getting the flu were significantly more likely to be vaccinated (96% and 91%, respectively), compared with Latinos (54%) who reported the same level of concern. Specifically, this study found that Latinos were more likely to report access and cost barriers, while African Americans were more likely to raise concern regarding mistrust of the vaccine's capabilities (Chen, Fox, Cantrell, Stockdale, & Kagawa-Singer, 2007).

Acculturation has been identified as one probable mediating factor between health disparities and ethnicity. Acculturation can be defined as the process and results of when individuals from one cultural group has continuous contact with another cultural group, resulting in cultural pattern changes for either or both groups while still maintaining to be distinct groups (Berry, 2003). Among a Latino sample, higher levels of acculturation was associated with higher fiber intake, lower saturated fat intake, and greater leisure exercise time (Mainous, Diaz, & Geesy, 2008). However, another study with Latino participants found that Latinos with greater acculturation tend to have more substance abuse problems, poorer dietary practices, and worse birth outcomes. However, they also tended to have more physical, vision, and dental checkups and were more likely to have healthcare insurance and use preventative services (Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005). First-generation Latino adolescents had high fruit and vegetable consumption and lower soda pop consumption than their White counterparts.

However, with each generation, soda pop consumption increased and fruit and vegetable consumption decreased (Allen, Elliot, Morales, Diamant, Hambarsoomian, & Schuster, 2007).

Studies show that Latinos are healthy upon immigrating to the United States, but are more prone to health deterioration across time (Guendelman & Abrams, 1994; Guendelman, English, & Chavez, 1995; see Vega & Amaro, 1994). Language, cultural differences, lack of health insurance, and lack of a regular healthcare source (Amar & de la Torre, 2002; Flores, Fuentes-Afflick, Barbot, Carter-Pokras, Calaudio, Lara, et al., 2002), have shown to negatively impact the health of Latino children. Bilingual school-age children from immigrant Mexican households have served as acculturative agents for familial food choices, at times, rejecting lower-calorie traditional foods prepared at home, and preferring higher-calorie foods, soda pops, and snacks (MacArthur, Anguiano, & Gross, 2004). Culture has also shown to play a role in Latino's perception of obesity risks. Results have shown that Latino mothers of obese children have less concern regarding their child's weight, despite these parents also believing that obese children should be taken to a nutritionist or physician for weight reduction (MacArthur, et al., 2004). Studies have shown that Latino mothers are more likely to associate thinness with poor health and disease proneness and report that their child will "grow out of (being overweight)" (Crawford, Gosliner, Anderson, Strode, Becerra-Jones, Samuels, et al., 2004), perhaps explaining this difference.

Broad guidelines describe how to identify, evaluate, and treat obesity (Spear, Barlow, Ervin, Ludwig, Saelens, Schetzina, & Taveras, 2007). However, these guidelines have not been tailored to be culturally specific (Caprio, Daniels, Drewnowski, Kaufman,

Palinkas, Rosenbloom, et al., 2008). Researchers pose that tailoring interventions that account for the influences of SES and culture could result in optimal treatments (Caprio, et al., 2008). For example, resistance training for Latino boys has shown to have success due to accounting for gender and cultural preferences (Stovitz, Steffen, & Boostrom, 2008)

Insurance Status: Organizational Level. Lack of health insurance has also been shown to effect primary healthcare (Urban Institute, 2002) and preventative healthcare (Sung, Alema-Mensah, & Blumenthal, 2002; Hsia et al., 2000), despite procedures being covered for by government healthcare programs. Persons without insurance are more likely to delay necessary medical care or fail to obtain medical care whatsoever (Institute of Medicine, 2001). From 1999 to 2009, persons not receiving or delaying their use of necessary medical care increased from 9% to 15%, among both uninsured and insured persons. Among the uninsured, 37% of adults 18-64 described not receiving healthcare due to cost (CDC/NCHS, 2011).

Despite efforts of the US government to combat the effects of poverty on health by increasing the availability of health care access via government-sponsored programs [i.e., CHIPRA, Medicare, Medicaid (Department of Health and Human Services, 2010)], low income families do not access healthcare for 5 million eligible children (DHHS, 2010) as well as continue to underutilize healthcare resources among the insured (Ward, Halpern, Schrag, Cokkinides, DeSantis, Brandi, et al., 2008; Wagner & Guendelman, 2000; Phillips, Morrison, Andersen, & Aday, 1998; Mueller, Patil, & Boilesen, 1998). Furthermore, rural children are at equal or greater risk to lacking insurance or receiving public insurance than their urban counterparts (Kaiser Commission on Medicaid and the

Uninsured, 2003) and Latino children represent the highest disparity of insurance status (DeNavas-Walt, Proctor, & Mills, 2003).

Rural and Urban: Community Level. Environmental influences have demonstrated to have a significant effect on health behavior. Residents of counties that are totally rural or adjacent to a metropolitan area are more likely to report having a usual source of care, compared to people residing in large metropolitan counties. However, people in most rural places report visiting the doctor fewer times throughout the year (Larson, et al., 2003). Persons residing in rural settings have been shown to spend more money annually on prescription medications (Machlin, et al., 2009). Other environmental factors include internet access. For example, approximately 40% of people with internet access report using the internet to look for advice or information about health or health care. Of these, 6% have e-mailed their health care professional, a third reported using the internet for health decisions, but does not indicate a relationship between utilization of health services. This study did not find a significant relationship between income and internet access (Nicholson, et al., 2005). Internet delivered interventions have demonstrated to have similar effects to in-person interventions (Ralston, et al., 2009).

Proposed Model

Adapting the HBM within a socioecological perspective to include meditational factors is proposed (see Figure 3). This model is based on previous research demonstrating the utility of the HBM model on adults examining both their parental and personal health beliefs. The proposed model of interacting personal and parental HBM provides novel information by examining health beliefs as the mediators between stress and healthcare perceptions with health behaviors. The proposed model tests a health

beliefs model by utilizing a latent-variable structure in order to reflect a more specified and structural reflection of the data. Lastly, the proposed model examines the role of interacting socioecological variables (insurance status, Latino status, urban/rural status, and obesity category) on outcome variables in order to provide a more population specific means of data analyses. In order to test this proposed model, the present study sample is composed of parents utilizing public healthcare to replicate prior research regarding the HBM and examine the roles of personal and parental health beliefs on subsequent personal and child health.

Proposed Hypotheses. Hypotheses are modeled in Figure 3. It is hypothesized that personal health beliefs will predict parental health beliefs, though the structure is unknown. Personal health beliefs and the mediating variables (perceived stress and healthcare perceptions) will predict adherences and BMI. It is hypothesized that greater personal perceived barriers and lesser benefits of healthy eating and exercise, disease severity, and disease likelihood will predict poorer personal health (i.e. less adherence to medical advice, greater consumption of fried foods and soda pop, less exercise, smoking status) and poorer child health (i.e. child diabetes, child obesity, greater consumption of soda pop and fried foods by child, and less days exercised per week by child). Greater parental perceived barriers and lesser benefits of healthy eating and exercise, disease severity, and disease likelihood will predict poorer child health. It is predicted that healthcare perceptions and perceived stress will act as mediators between parental health beliefs, personal health beliefs, personal health risk behaviors, positive personal health behaviors, and child health. It is also predicted that the pathways of the personal HBM model and parental HBM model will have different architecture based on the rural/urban

status, Latino status, and insurance status groupings. It is hypothesized that there will be interacting group differences (Latino status X insurance status X rural/urban and Latino status X insurance status X obesity category) on both personal and parental physical health variables (Figure 4) and mental health variables (Figure 5).

Figure 3. Proposed Full Physical Health Belief Model

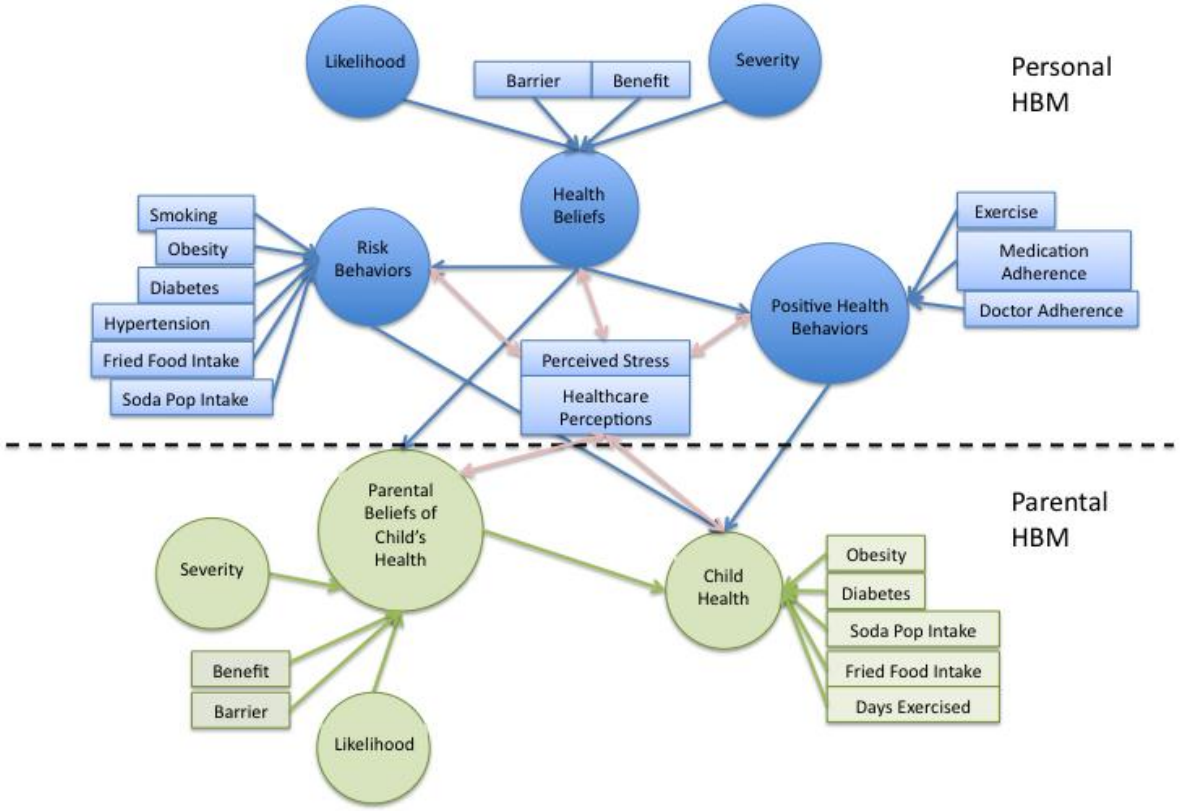
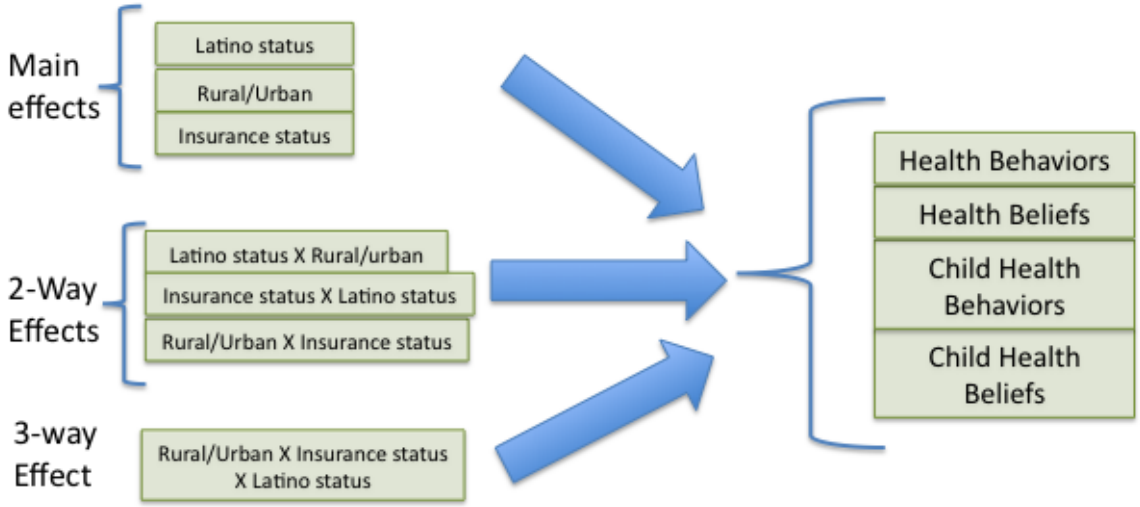
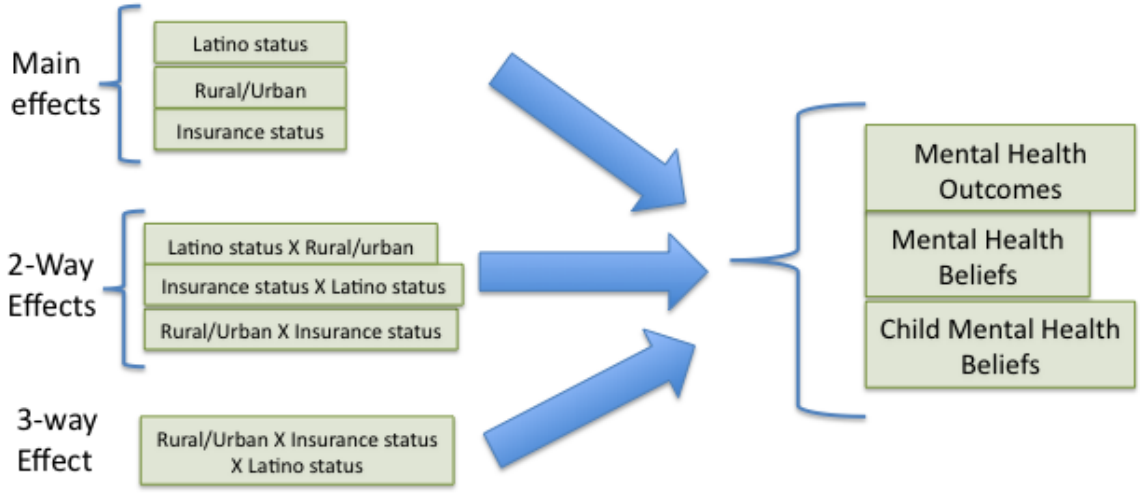


Figure 4. Proposed Physical Health Group Differences



**Analyses will also include the examination of Rural/Urban X Latino Status X BMI Category effects*

Figure 5. Proposed Mental Health Group Differences



**Analyses will also include the examination of Rural/Urban X Latino Status X BMI Category effects*

Chapter 2: Method

Participants

In total, 317 participants completed the questionnaire battery (see Appendix C and Appendix D) out of the 400 participants who received who consented to participate in the study. Participant demographic information is given in Table 2. Inclusionary criteria included being at least 19-years-old and able to read the consent form and questionnaire in English or Spanish.

Table 1. Data Collection Site Statistics

Site	**Counties**	**Rural-Urban Continuum Code**[b]	**Description**[b]	**Persons living in poverty**[a]	**All ages poverty %**[a]	**Under age 18 poverty %**[a]
Central District Health Department (Grand Island, NE)	Hall	5	NM, U, NA	6,889	12.5	16.9
	Hamilton	7	NM, U, NA	678	7.4	10.4
	Merrick	7	NM, U, NA	759	10.1	13.8
South Heartland District Health Department (Hastings, NE)	Adams	5	NM, U, NA	3,254	10.3	13.7
	Clay	9	NM, R, NA	645	10.5	13.2
	Nuckolls	9	NM, R, NA	583	13.2	21.1
	Webster	9	NM, R, NA	390	11.5	16.6
People's Health Center (Lincoln, NE)	Lancaster	2	UM	28,086	10.6	11.3
Oneworld Community Health Center (Omaha, NE)	Douglas	2	UM	59,511	12.2	15.0

[a]Estimates for Nebraska Counties, 2008 derived from US Census estimates
[b] Rural-Urban Continuum Codes for NE provided by the US Department of Agriculture, 2003 (UM=Urban metro, NM=Non-metro, U=Urban, R=Rural, NA=Non-adjacent to a metro area)

Participant recruitment. Participants were recruited within data collection sites in three ways. First, reception staff and/or the principal investigator directly solicited participants. Second, individuals that arrived at clinics for appointments were presented with a flyer at appointment check-in. Third, flyers were posted in waiting rooms of each healthcare location. All flyers included Spanish translation. Demographics of enrolled participants were tracked monthly to ensure each site met their targeted enrollment estimates.

Instrument Development Procedure

Health Beliefs. The study's approach used a survey-based design developed to assess health beliefs that parents hold about their health as well as the health beliefs they possess regarding the health of their children. Health beliefs were explored via a tailored questionnaire modeled after previous research regarding health beliefs (Janz, et al., 1984; Rosenstock, et al., 1994; Sherman, et al., 2008; Clark, et al., 1998; Connor, et al., 1996; Juniper, et al., 2004; Brewer, et al., 2007; Brewer, et al., 2007; Painter, et al., 2008; Winfield, et al., 2002; Sedlak, et al., 2007; Sullivan, White, Young, & Scott, 2010). Assessment of parental and personal health beliefs regarding exercise, healthy eating and stigmatization of mental healthcare occured via novel scales. The parental/personal exercise/health eating scales was developed based on research citing the major barriers and benefits to such behaviors (Sechrist, Walker, & Pender, 1987; Lappalainen, Saba, Holm, Mykkanen, Gibney, & Moles, 1997; Fletcher, Galady, Blair, Blumenthal, Caspersen, Chaitman, 1996; Zunft, Friebe, Seppelt, de Graaf, Margetts, Schmitt, et al., 1997). Participants were asked to endorse (check) or not endorse (leave blank) listed

healthy eating and exercising barriers and benefits. Parents were asked to assess likelihood and severity variables by rating their perceived likelihood (not likely, somewhat likely, likely, very likely, my doctor has told me I have this disease) and severity (not severe, somewhat severe, severe, very severe, my doctor has told me I have this disease) for heart disease, stroke, diabetes, obesity, high blood pressure, COPD, asthma, cancer, depression, and anxiety for both themselves and their children.

Health risks and health behaviors inventory. Parents were queried about their own health risk behaviors and conditions and the health risk behaviors and conditions of their children, as well as positive indicators of good health based on the guidelines of the US Department of Health and Human Services (2005). We used this as a proxy measure of child health, as parental reports of their child's health have demonstrated to be a reliable measure of the child's health (Varni et al., 2007). Body mass index (BMI) was calculated from the self-report height and weight questions. BMI category was assigned using criteria from guidelines for the evaluation and treatment of obesity (National Institutes of Health, National Heart, Lung, and Blood Institute, 1998): lean (BMI=18.5-24.9), overweight (BMI=25-29.9), or obese (BMI≥30.0).

Perceptions of healthcare. The survey explored personal perceptions of healthcare accessibility and stigmatization. Part of the questions assessed the respondent's perception of respect, time, and involvement in the decisions given by their doctors and overall healthcare satisfaction. The second set of questions included the levels of likelihood, comfort, and embarrassment the respondent anticipants when seeking mental health services for themselves or their children. Participants were asked to rate on a scale

of 1 (low) to 5 (high) their feelings regarding these variables. Questions were based on the National Comorbidity Survey (Kessler, 2002).

Mood and Stress. Because stress and mood have been shown to significantly relate to health (Segerstrom & Miller, 2004; Herbert & Cohen, 1993; Barth, Schumacher, & Hermann-Lingen, 2004; DiMatteo, Lepper, & Croghan, 2000), the survey also included the Perceived Stress Scale (Cohen & Williamson, 1988; Cohen, Kamarck, & Mermelstein, 1983) and items from the National Comorbidity Survey (Kessler, 2002).

Spanish Translation. To ensure that a Spanish-speaking population can also participate in this study, the questionnaire was translated forward and backward into Spanish and therefore meets the Healthy People 2010 Objective 7-11 (DHHS, 2000). Objective 7-11 aim to increase local health department community health promotion and disease prevention programs that are both culturally appropriate and linguistically competent, specifically focusing on heart disease stroke, cancer, mental health, nutrition, physical activity, and educational and community-based programs (DHHS, 2000). Experts in the Modern Languages Department at the University of Nebraska – Lincoln, conducted this translation.

Procedures

Survey administration. The survey instrument took approximately 20 to 40 minutes to complete and was administered in waiting rooms and doctors' offices. Either the principal investigator or trained clinic employees administered the survey. Informed consent was obtained from all participants before completion of the survey. Upon completion and return of the survey, each participant was entered into a lottery to receive $10. Training consisted of understanding how to obtain informed consent, administer the

instrument, address questions and check for completion of the survey. The principal investigator conducted training sessions. Because data collection occurred at each site within a two-month time frame, compliance checks were conducted within the first two weeks of the data collection. Compliance checks indicated that each site was complying with data protocol.

Data collection. Data collection occurred at four separate organizations, representing two urban (Rural-Urban Continuum Codes 0-2) and two rural (Rural-Urban Continuum Codes 4-9) populations. These organizations included two Federally Qualified Healthcare Centers, One World Community Health Center in Omaha, NE and People's Health Center in Lincoln, NE. In conjunction with the Nebraska Department of Public Health, two separate multi-county sites will also provide data collection locations. These included Central District Health Department (Grand Island, NE) and South Heartland District Health Department (Hastings, NE). Each site offered a variety of specific collection locations targeting parents, such as WIC, child immunization, and primary care clinics. This study approach was consistent with the Healthy People 2010 objective 23-14, aimed at improving Public Health Infrastructure via epidemiological data collection (DHHS, 2000).

Chapter 3: Analyses

Data Management. The primary investigator and two CITI-trained undergraduate research assistants conducted data entry. The research assistants each received individualized training in data entry. Random reentry of 10% of the data occurred post data entry. Due to the minimal mistakes found in the reentry, data checking was considered complete. Following data cleaning, preliminary analyses were conducted to examine bivariate relationships between personal health beliefs and parental health beliefs, health risks, healthcare access, healthcare stigma, and psychosocial variables (i.e. perceived stress). Additional bivariate analyses examined these relationships between various demographic factors (i.e. ethnicity, insurance status, and urban/rural status).

Structural Equation Modeling (SEM) path analyses determined the relationships among the variables of interest (See Figure 1). SEM was employed for a number of reasons. It developed a model of the relations amongst variables in order to determine causal and associative relationships (Duncan, Duncan, & Strycker, 2006; Kline, 2005). SEM tested for both linear and non-linear effects on the criterion variables (Bollen, 1986) and inferred the existence of latent variables from a pattern of correlations among observed variables (Molenberghs & Verbeke, 2005). Models were estimated using M Plus version 5.1. Additionally, SEM was the ideal method for testing moderation and mediation relationships in complex systems because of the method's ability to consider multiple pathways while simultaneously allowing for multiple mediators and moderators as well as moderated mediation and mediated moderation (Little, Bovaird, & Widaman, 2006). Chi-Square Test of Model Fit, Comparative fit index (CFI) and Standardized Root

Mean Square Residual (SRMR) were used as the primary criteria of model fit with cutoff values of CFI>.95, and SRMR<.06 interpreted to indicate good model fit.

Model selection was driven by parsimony when original models did not fit, which involves modifying models based on empirical literature (Chin & Todd, 1995). Also, in order to prevent model specification being driven by statistical results, and not empirical research, model modifications will only involve the reduction of parameters, not the addition of parameters. For example, a posteriori additions of parameters have been shown to produce a false improvement of fit due to capitalization of chance (see Bozdogan, 1987; Browne & Cudeck, 1989, Marsh, Balla, & Hau, 1996). Mathematicians have shown a preference for a model-selection approach to SEM. This involves selecting a model for its theoretical fit, and not driven due to statistical fit. The chances of testing any model that is absolutely correct in all its particulars is highly unlikely, and thus it is expected that a model is a useful approximation to the data-generating process (MacCallum, 2003). Model selection and modification is a fundamental aspect of the empirical inferential process (Platt, 1964) and therefore, modified models may need to replace prior models due to parsimony (Preacher, 2006). Because all persons completed the same survey and informed consent form, this will assist in placing procedural controls in place.

Challenges to data management and analyses. Given the probability of missing data, procedural and statistical methods were implemented to account for this. Statistically, the SEM framework directly implements the full information maximum likelihood approach. This allowed for the use of incomplete cases to inform the overall model as opposed to traditional ANCOVA list-wise deletion approaches (Bollen, 1989).

Preliminary analyses. Data was checked for entry errors and outliers. Descriptive analyses, correlations, simple ANOVA, and Chi-Square analyses examined the sample characteristics and associations among the variables.

Primary Analyses: The full health beliefs model including the relationship between parental and personal health beliefs was tested utilizing a latent-variable structure SEM (Figure 3). Each health belief was modeled as an individual latent variable with appropriate factors loading onto each latent variable. Barriers, benefits, likelihood, and severity were composed based on responses on the health beliefs portion of the questionnaire. Barriers and benefits were total score exogenous variables from questions regarding healthy eating and exercise barriers and benefits. Likelihood and severity latent variables were composed from the severity and likelihood scales for obesity, diabetes, stroke, heart disease, cancer, and hypertension. Personal health beliefs was modeled to predict positive health behaviors (e.g. days exercised, medication adherence, and adherence to doctor's advice) and risk behaviors (smoking, obesity, diabetes, hypertension, fried food intake and soda pop intake). Child health was modeled as a latent variable with factors of child obesity, child diabetes, child's soda pop intake, child's fried food intake, and days child exercised per week. Perceived stress, feeling respected by doctors, feeling that the doctor spends an adequate amount of time during visits, and feeling involved with the doctor's decisions were modeled as mediating variables between personal and parental health beliefs, personal health risk behaviors, personal positive health behaviors, and child's health. Model modifications were made based on model parsimony and model fit. To examine grouping differences, the model

was ran separately per grouping variable (e.g. insurance status, Latino status, and rural/urban status).

Next, two SEM models examined parental health beliefs and personal health beliefs separately (Figure 3). Follow-up analysis examined the models as factored models, with the four separate HBM variables (severity, likelihood, benefits, and barriers) predicting the outcome variables in order to determine if there are differential effects of health belief factors on specific health outcomes. These two models were then tested separately to determine structural make-up of each group. Groups included rural/urban status, Latino status, and insurance status.

Then, factorial ANOVA analyses tested the interrelationship between the independent population variables and outcome variables for personal and child physical health (Figure 4) and mental health (Figure 5). This included examining Rural/Urban X Latino Status X Insurance and Rural/Urban X Latino Status X Obesity Category interaction predictors. Outcome variables were of two kinds: Physical health related variables and mental health related variables.

Physical health related variables included: BMI, eating barriers, eating benefits, exercise barriers, exercise benefits, child eating barriers, child eating benefits, child exercise barriers, child exercise benefits, travel time to appointment, feeling respected by doctors, feeling that doctors spent time with participant, doctor involving patient in healthcare decisions, adherence to doctor's advice, adherence to medication regimen, overall level of healthcare satisfaction, weekly soda pop consumption, child weekly soda pop consumption, weekly fried food consumption, weekly child fried food consumption, days exercised per week, and days child exercised per week, likelihoods of high blood

pressure, heart disease, cancer, stroke, diabetes for both the parents and their children (Figure 4).

Mental health related variables included: total perceived stress, likelihood seeing a mental health professional if participant had a serious mental/emotional problem, comfortableness seeing a mental health professional if participant had a serious mental/emotional problem, embarrassment seeing a mental health professional if participant had a serious mental/emotional problem, comfortableness with their child seeing a mental health professional if participant had a serious mental/emotional problem, embarrassment with their child seeing a mental health professional if participant had a serious mental/emotional problem, anxiety likelihood, depression likelihood, child anxiety likelihood, and child depression likelihood (Figure 5).

Chapter 4: Results

Preliminary Analyses

Demographic information is presented in Table 2. The majority of participants identified themselves as White (N=140) or Latino/a (N=135). Others identified themselves as African/African-American (N=13), American Indian (N=8), Asian-American (N=3), and Kurdish (N=2). Women composed the majority of participants (N=244), compared to men (N=62). English was the preferred language of 189 participants, Spanish was the preferred language of 110 participants. One-hundred thirty participants identified themselves as immigrants, with a mean time within the United States of 10.43 years (SD=6.44). See Table 3 for immigrant country-of-origin. Three participants reported preferring a language other than English or Spanish. Participants reported having varying levels of education, including 8th grade or less (N=75), some high school (N=32), high school graduate (N=86), some technical school or college (N=20), college graduate (N=22), and post-graduate degree (N=7). Participants reported being employed for wages (N=127), out of work for less than a year (N=27), out of work for more than a year (N=44), homemakers/supported by spouse (N=64), students (N=23), retired (N=5), and unable to work (N=10). Two-hundred nineteen participants reported earning $35,000 or less yearly, 45 reported not knowing their yearly salary, and 27 people did not respond to this question.

Table 2. Demographic Information of Participants

Variable		Total (N)	Percent (%)
Internet Frequency	Never	96	30.28
	Monthly	42	13.25
	Weekly	33	10.41
	Daily	125	39.43
	Missing	21	6.62
Insurance Change after 2014	Decrease	64	20.19
	Stay the same	149	47.00
	Increase	73	23.03
	Missing	95	29.97
Current Depression Screener	No	209	65.93
	Yes	59	18.61
	Missing	49	15.46
Lifetime Depression	No	156	49.21
	Yes	112	35.33
	Missing	49	15.46
Lifetime Smoking	No	169	53.31
	Yes (68 current)	96	30.28
	Missing	52	16.40
Highest Level of Education	8th grade or less	75	23.66
	Some high school	32	10.09
	High school graduation or GED	86	27.13
	Some technical school or college	62	19.56
	Technical school graduate	20	6.31
	College graduate	22	6.94
	Postgraduate/Professional degree	7	2.21
	Missing	13	4.10
Employment	Employed for wages/self-employed	127	40.06
	Out of work > 1 year	27	8.52
	Out of work < 1 year	44	13.88
	Homemaker/Supported by other family	64	20.19
	Student	23	7.26
	Retired	5	1.58
	Unable to work	10	3.15
	Missing	17	5.36
Insurance Type	None for a year or longer	132	41.64
	None, but have had it within the past 12 months	32	10.09
	Medicaid/Medicare	74	23.34
	Other/Private	52	16.40
	Missing	27	8.52
Children's Insurance Type	None for over 12 months	44	13.88
	None, but have in the past 12 months	13	4.10
	Medicaid/Medicare	167	52.68
	Other/Private	38	11.99
	Missing	55	17.35
Household Income	Less than $14,999	118	37.22
	$15-24,999	68	21.45
	$25-34,999	33	10.41
	Greater than $35,000	26	8.20
	Don't know	45	14.20
	Missing	27	8.52
Age	M = 31.60 SD = 9.39		
# of Children	M= 2.33 SD = 1.47		
Household Size	N = 3.39 SD = 1.79		

Univariate analyses examined the group differences of demographic variables. Grouping variables included urban/rural status, Latino status, and insurance status. Results are reported in Table 4 and 5.

Primary Analyses

SEM analyses testing the relationship between personal and parental health belief variables (Figure 3) did not converge due to exceeded iterations and therefore is inconclusive. Evidence suggests more participants are needed. Therefore, the following analyses were modified based on parsimony, prior literature, and model fit (Preacher, 2006). This included modeling the personal HBM and parental HBM separately. The personal HBM did not converge when the four health belief factors composed a single health beliefs latent variable. Therefore, in accordance with parsimony and model fit, analyses tested a factored model with severity and likelihood modeled as latent variables; barriers and benefits were modeled as total scores from combining respective eating and exercise scales (see Figure 6).

Table 3. Country of Origins Reported by Immigrant Participants

	Total (N)	%
Cuba	5	3.8
El Salvador	9	6.9
Germany	1	0.7
Guatemala	10	3.0
Honduras	5	3.8
India	1	0.7
Iraq	1	0.7
Mexico	71	54.6
Netherlands	1	0.7
Pakistan	1	0.7
Somalia	1	0.7
Vietnam	2	1.5
Total	130	100

Table 4. Number of Participants Across Demographics Categories

	Non-Latino (154)	Latino (152)	Rural (159)	Urban (158)
Rural	87[a]	67[a]		
Urban	67[a]	85[a]		
Non Insured (164)	64[b]	81[b]	65[c]	99[c]
Insured (126)	94[b]	45[b]	80[c]	46[c]

[a] χ^2=4.72 (.04) [b] χ^2=16.22 (<.001) [c] χ^2=15.86 (<.001)

Modifications for model fit and parsimony determined personal beliefs regarding likelihood and severity of obesity, high blood pressure, and diabetes provided the best fit. Adherence (positive health behaviors) and healthcare perception variables were modeled as exogenous variables, not latent variables as originally posed due to model fit. The risk behaviors latent variable did not provide for good model fit, and therefore a single exogenous variable (BMI) was used as the single health risk behavior, given its high association with other exogenous health risk variables (e.g. hypertension, diabetes, soda pop intake, fried food intake). Overall model fit was good for the full factored model [$\chi^2(47)=65.79$, CFI = .98, SRMR = .033] (see Figure 6). Disease likelihood was modeled using obesity likelihood ($\beta=.86$, $p<.001$), high blood pressure likelihood ($\beta=.56$, $p<.001$), and diabetes likelihood ($\beta=.53$, $p<.001$). Disease severity was modeled using obesity severity ($\beta=.87$, $p<.001$), high blood pressure severity ($\beta=.93$, $p<.001$), and diabetes severity ($\beta=.83$, $p<.001$). Disease likelihood significantly predicted BMI ($\beta=.59$ $p<.001$) and was predicted by perceived stress ($\beta=.16$, $p=.02$). Disease severity significantly predicted adherence to doctor's advice ($\beta=.17$, $p=.01$) and was predicted by time spent with doctors ($\beta=-.24$, $p=.01$). Eating/exercise barriers was predicted by perceived stress ($\beta=.29$, $p<.001$). Adherence to doctor's advice was predicted by perceived stress ($\beta=-.11$, $p=.05$) and feeling respected by doctors ($\beta=.38$, $p<.001$). Medication adherence was predicted by perceived stress ($\beta=-.13$, $p=.03$), feeling respected by doctors ($\beta=.27$, $p=.001$), and feeling involved with the doctor's decisions ($\beta=.18$, $p=.02$).

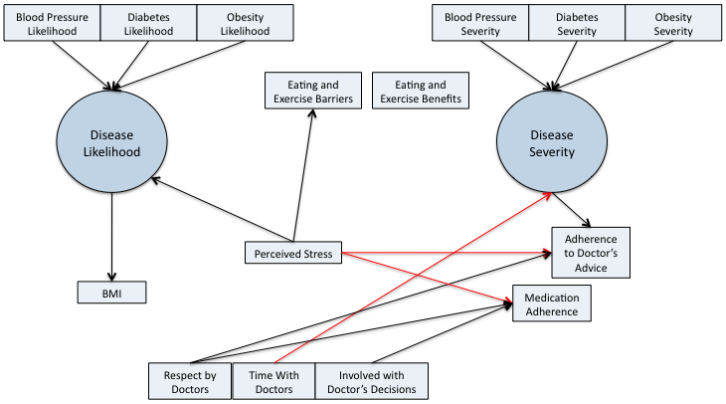
Table 5: Univariate Statistics by Grouping Variable

Variable	Choice	Total	Non-Latino	Latino	χ^2	Rural	Urban	χ^2	Non-Insured	Insured	χ^2
Internet Frequency	Never	96	42	52	4.39	57	39	9.86*	53	39	0.72
	Monthly	42	22	20		21	21		20	20	
	Weekly	33	15	18		20	13		18	14	
	Daily	125	72	52		50	75		66	50	
Insurance Change after 2014	Decrease	64	23	40	12.05*	22	42	9.28*	42	19	23.99**
	Stay the same	149	91	57		85	64		56	83	
	Increase	73	34	38		38	35		49	20	
Current Depression Screener	No	209	106	97	0.08	123	86	7.324*	109	92	0.65
	Yes	59	32	27		23	36		34	25	
Lifetime Depression	No	156	77	74	0.4	94	62	4.41*	80	69	0.18
	Yes	112	61	50		53	59		62	48	
Lifetime Smoking	No	170	66	101	32.63**	97	73	1.44	98	63	5.89
	Yes (68 current)	167	73	23		49	50		45	54	
Highest Level of Education	8th grade or less	75	10	63	67.74**	30	45	10	47	20	12.21
	9^{th}-12^{th} grade	32	11	21		17	15		18	12	
	HS Grad/GED	86	55	30		50	36		45	38	
	Some technical school or college	62	43	19		34	28		24	36	
	Technical school graduate	20	11	9		10	10		10	7	
	College graduate	22	17	4		10	12		13	9	
	Postgrad/Prof Degree	7	5	2		1	6		3	3	
Employment	Employed/self-employed	127	77	48	20.26*	71	56	7	55	66	26.30**
	Not working>1yr	27	8	18		12	15		20	5	
	Out of work<1yr	44	22	22		18	26		29	11	
	Homemaker/Supported by other	64	21	42		34	30		38	22	
	Student	23	14	9		11	12		11	10	
	Retired	5	3	2		1	4		3	1	
	Unable to work	10	7	3		3	7		1	9	
Insurance Type	None > 12 months	132	45	83	23.70**	52	80	25.11**	132	0	N/A
	None, but have had in past 12 months	32	19	11		13	19		32	0	
	Medicaid/Medicare	74	48	26		49	25		0	74	
	Other/Private	52	33	19		31	21		0	52	
Children's Insurance Type	None > 12 months	44	13	29	10.5*	13	31	19.90**	38	5	43.04**
	None, but have had in past 12 months	13	6	7		4	9		9	4	
	Medicaid/Medicare	167	81	82		106	61		88	77	
	Other/Private	38	25	13		21	17		6	31	
Household Income	Less than $14,999	118	64	53	15.93*	55	63	7	69	41	10.15
	$15-24,999	68	31	36		37	31		37	30	
	$25-34,999	33	17	15		19	14		15	14	
	Greater than $35,000	26	20	6		12	14		9	17	
	Don't know	45	14	30		22	23		24	16	

**p<.05 ** p<.001*

Follow-up analyses tested the most parsimonious personal health beliefs model (see above) according to grouping variables: urban/rural, Latino status, and insurance status. Good fit was demonstrated for the urban/rural model [$\chi^2(102) = 144.75$, CFI = .96, SRMR = .056] (Figure 7).

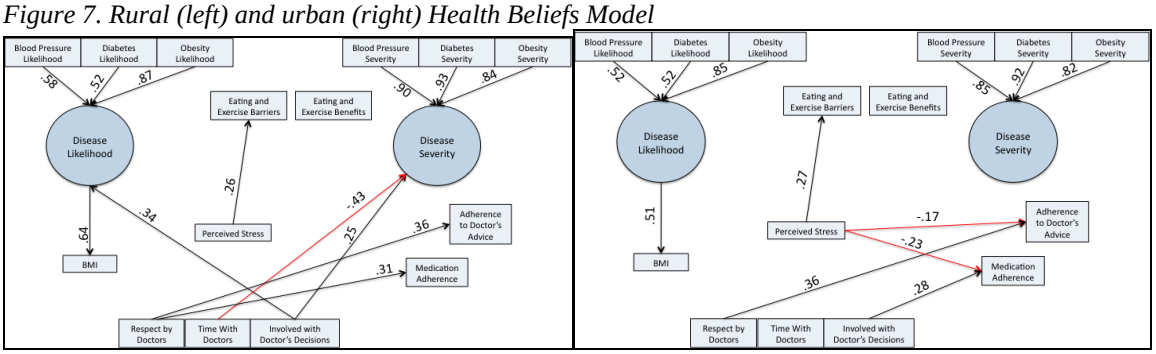
Figure 5. Personal Health Beliefs Model



**Red lines = negative relationships Black lines = positive relationships*

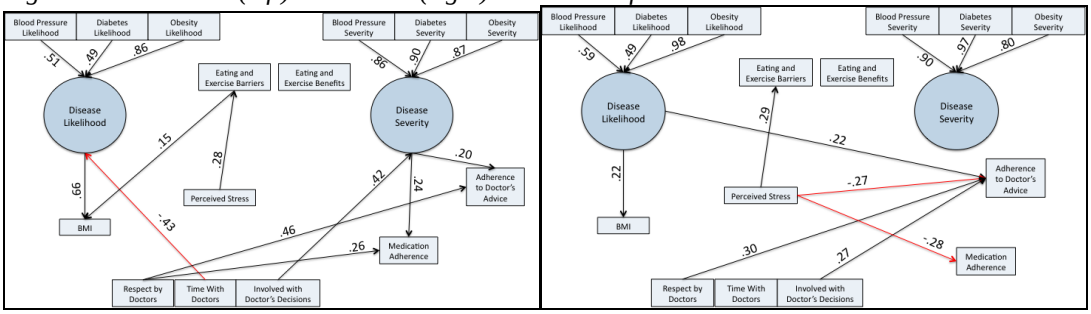
Among rural persons, disease likelihood was predicted by doctor's involvement (β=.34, *p*=.008). Disease seriousness was predicted by doctor involvement (β=.25, *p*=.033) and time with doctor (β=-.43, *p*=.005). BMI was predicted by disease likelihood (β=.64, *p*<.001). Feeling respected by doctors predicted adherence to doctor's advice (β=.36, *p*=.002) and adherence medication (β=.31, *p*=.009). Perceived stress predicted eating/exercise barriers (β=.26, *p*=.001). Among urban persons, disease likelihood predicted BMI (β=.51, *p*<.001). Adherence to doctor's advice was predicted by perceived stress (β=-.17, *p*=.048) and feeling respected by doctors (β=.36, *p*=.001). Medication adherence was predicted by perceived stress (β=-.228, *p*=.008) and involvement with the doctor's decisions (β=.28, *p*=.013). Eating/exercise barriers was predicted by perceived stress (β=.27, *p*=.002).

Figure 7. Rural (left) and urban (right) Health Beliefs Model



Good fit was found for the Latino status model [$\chi^2(102) = 131.21$, CFI = .97, SRMR = .051] (Figure 8). Among non-Latinos, involvement with doctor's decisions predicted disease likelihood (β=.34, *p*=.008) and disease severity (β=.25, *p*=.033). Time with doctors predicted disease severity (β=-.43, *p*=.005). BMI was predicted by disease likelihood (β=.64, *p*<.001). Among Latinos, perceived stress predicted eating/exercise barriers (β=.29, *p*=.001), adherence to doctor's advice (β=-.27, *p*=.001), and medication adherence (β=.28, *p*=.001). Disease likelihood predicted BMI (β=.41, *p*<.001) and adherence to doctor's advice (β=.22, *p*=.016). Adherence to doctor's advice was predicted by feeling respected by doctors (β=.30, *p*=.004) and feeling involved with the doctor's decisions(β=.27, *p*=.005).

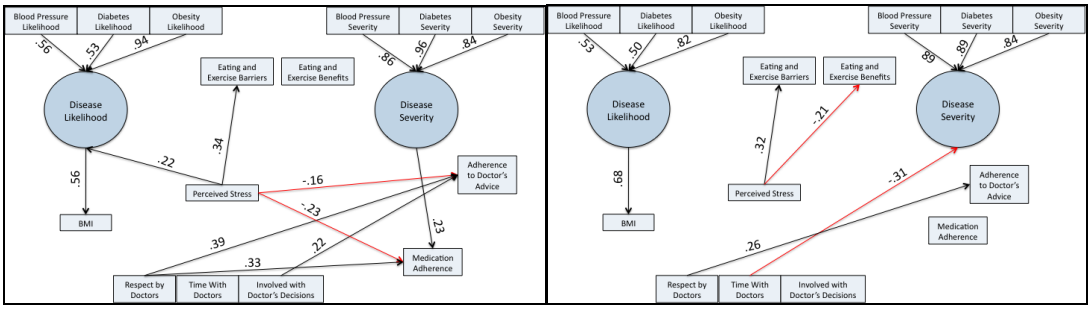
Figure 8. Non-Latino (left) and Latino (right) Health Beliefs Model



The insurance status model demonstrated good fit [$\chi^2(102) = 133.85$, CFI = .97, SRMR = .051] (Figure 9). Among those without insurance, disease likelihood was

predicted by perceived stress (β=.22, *p*=.021), and disease likelihood predicted BMI (β=.56, *p*<.001). Medication adherence was predicted by disease severity (β=.23, *p*=.008), perceived stress (β=-.23, *p*=.003), and feeling respected by doctors (β=.33, *p*=.002). Adherence to doctor's advice was predicted by perceived stress (β=-.16, *p*=.039), feeling respected by doctors (β=.39, *p*<.001), and feeling involved with doctor's decisions (β=.22, *p*=.018). Among persons with insurance, time with doctors predicted disease severity (β=-.31, *p*=.034). Disease likelihood predicted BMI (β=.68, *p*<.001). Feeling respected by doctors predicted adherence to doctor's advice (β=.26, *p*=.046). Perceived stress predicted healthy eating/exercise barriers (β=.32, *p*<.001) and healthy eating/exercise benefits (β=-.21, *p*=.033).

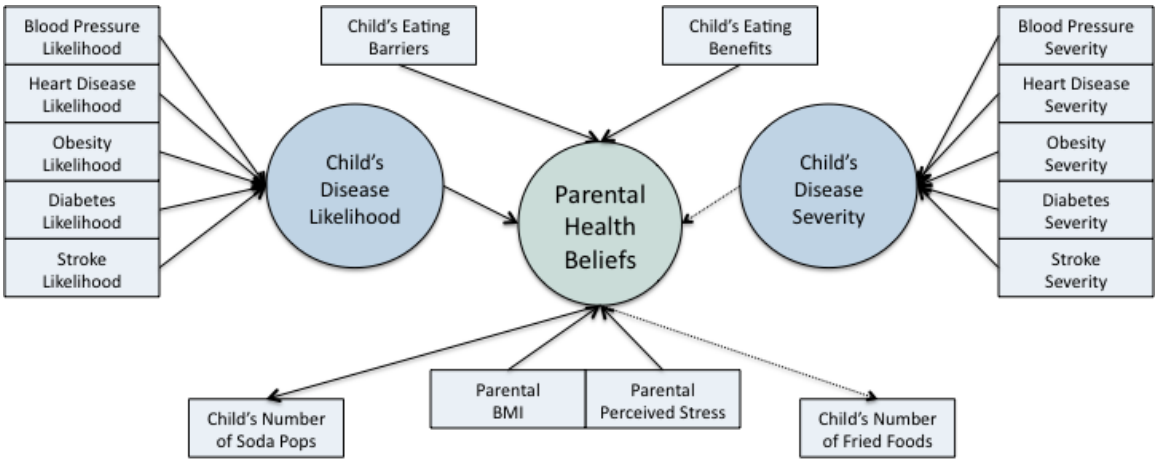
Figure 9. Non-insured (left) and insured (right) Health Beliefs Model



SEM analyses testing the parental health beliefs model proposed in the bottom half of Figure 3 did not provide good fit, and therefore was modified to be parsimonious and provide good fit. The parental health beliefs latent variable was constructed using two latent variables (child's disease likelihood and child's disease severity) and two exogenous variables (child's healthy eating barriers and child's healthy eating benefits). Perceived stress and parental BMI was modeled to predict parental health beliefs, and parental health beliefs was modeled to predict child's fried food and soda pop

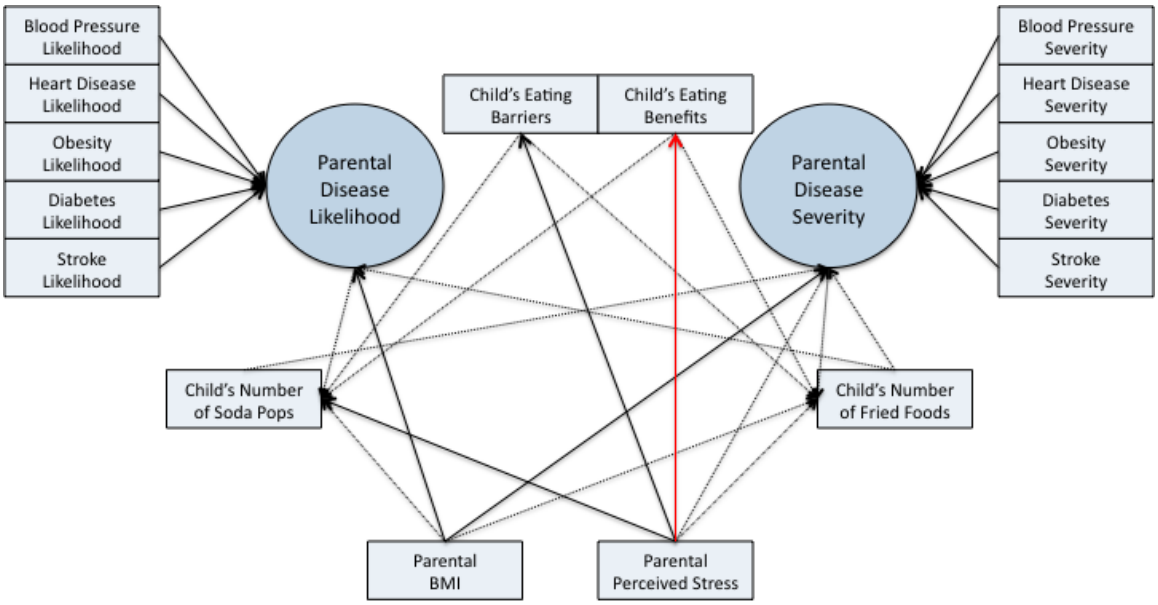
consumption. This model demonstrated to have good fit [$\chi^2(100) = 194.21$, CFI = .95, SRMR = .058] (Figure 10). Perceived child's disease likelihood was a latent variable modeled by child high blood pressure likelihood (β=.82, p<.001), child heart disease likelihood (β=.84, p<.001), child stroke likelihood (β=.78, p<.001), child diabetes likelihood (β=.62, p<.001), and child obesity likelihood (β=.77, p<.001). Child's disease severity was a latent variable modeled by child high blood pressure severity (β=.92, p<.001), child heart disease severity (β=.97, p<.001), child stroke severity (β=.97, p<.001), child diabetes severity (β=.96, p<.001), and child obesity severity (β=.91, p<.001). Parental health beliefs was modeled by child disease likelihood (β=.40, p<.001), child disease severity (β=.09, p=.42), child healthy eating barriers (β=.21, p=.001), and child healthy eating benefits (β=-.23, p=.05). Parental health beliefs was predicted by perceived stress (β=.51, p=.001) and parental BMI (β=.30, p=.05). In turn, parental health beliefs predicted child's number of soda pops (β=.36, p=.002), but not child's number of fried foods (β=.11, p=.38). Child's number of soda pops significantly correlated with child's number of fried foods (β=.34, p<.001). Significant indirect effects found that both parents' perceived stress (β=.18, p=.008), and parental BMI (β=.11, p=.03) indirectly predicted child's number of soda pops via child health beliefs. Group differences SEM models utilizing grouping variables (urban/rural, Latino status, and insurance status) did not provide good fit and therefore were inconclusive.

Figure 10. Full Parental Health Beliefs Model



Next, analyses tested a factored parental health beliefs model, with each health belief modeled separately of another. This model had a good fit [$\chi^2(87) = 1180.99$, CFI = .95, SRMR = .045] (Figure 11). Child's disease likelihood was a latent variable modeled by child high blood pressure likelihood (β=.82, p<.001), child heart disease likelihood (β=.84, p<.001), child stroke likelihood (β=.78, p<.001), child diabetes likelihood (β=.62, p<.001), and child obesity likelihood (β=.77, p<.001). Child's disease severity was a latent variable modeled by child high blood pressure severity (β=.92, p<.001), child heart disease severity (β=.97, p<.001), child stroke severity (β=.97, p<.001), child diabetes severity (β=.96, p<.001), and child obesity severity (β=.91, p<.001). Parental BMI predicted child disease likelihood (β=.26, p=.001) and child disease severity (β=.17, p=.02). Parental perceived stress predicted child 's number of soda pops (β=.18, p=.01), child eating barriers (β=.16, p=.03), and child eating benefits (β=-.16, p=.04). Group difference SEM models did not converge.

Figure 11. Factored Parental Health Beliefs Model



Factorial ANOVA analyses examined interactions of grouping variables on physical health related and mental health related outcome variables, controlling for parents' age and gender (Table 4 and Table 5). Two series of analyses were conducted: rural/urban X Latino status X insurance status (Table 6 and Table 7) and Rural/Urban X Latino status X BMI Category (Table 8 and Table 9).

Analyses testing the urban /Urban X Latino status X Insurance found two significant 2-way interactions and no significant 3-way interactions regarding physical health related variables. There was a significant Rural/urban X Latino status interaction predicting weekly soda pop consumption (F=6.03, p=.02). Follow-up analyses (LSDmmd=1.94) demonstrated that non-insured non-Latinos (M=8.52) had the most soda pops of all groups.

There were no significant differences between insured non-Latinos (*M*=4.84), insured Latinos (*M*=4.76), and non-insured Latinos (*M*=3.19). Follow-up analyses (LSDmmd=1.94) demonstrated that rural non-Latinos (*M*=3.48) had the most soda pops. There were no significant differences between urban non-Latinos (*M*=4.56), urban Latinos (*M*=4.46), and rural Latinos (*M*=3.48).

Table 6. Factorial ANOVA Rural/Urban X Latino Status X Insurance Status Effects on Physical Health

Variable	Rural/Urban X Latino	Rural/Urban X Insured	Latino X Insured	3-Way Interaction
BMI	1.26	0.01	3.27	0.73
Weekly Soda Pop	6.03*	2.23	6.00*	0.19
Weekly Child Soda Pop	0.60	0.09	0.00	0.15
Weekly Fried Foods	1.73	0.06	2.21	0.30
Weekly Child Fried Foods	1.75	0.03	0.00	0.05
Days Exercised	1.75	0.03	0.00	0.05
Child Days Exercised	0.83	0.06	1.44	0.97
Eating Barriers	0.04	0.07	2.11	0.80
Eating Benefits	0.06	0.00	0.01	0.78
Exercise Barriers	0.06	0.00	0.01	0.78
Exercise Benefits	0.44	0.00	0.12	0.02
Child Eating Barriers	1.03	0.68	0.23	0.56
Child Eating Benefits	0.01	1.62	0.17	0.33
Child Exercise Barriers	0.85	0.56	0.01	0.37
Child Exercise Benefits	0.04	2.87	0.11	0.02
Travel Time	0.94	1.49	1.23	0.21
Feel Respect by Doctors	0.24	0.44	0.45	0.00
Doctors Spent Time With Participant	0.38	0.28	0.39	0.05
Doctors Involved Participant with Decisions	3.47	0.66	0.00	0.05
Adhere to Doctor's Advice	0.14	0.33	1.41	0.18
Adhere to Medication Regimen	0.22	0.50	0.25	1.03
Overall Level of Healthcare Satisfaction	0.01	0.03	1.24	0.01
High BP Likelihood	0.22	0.05	0.89	0.04
Heart Disease Likelihood	0.25	0.02	0.01	0.07
Cancer Likelihood	0.17	0.02	0.54	0.02
Stroke Likelihood	0.21	0.00	0.71	0.14
Diabetes Likelihiood				
Child High Blood Pressure Likelihood	0.47	0.00	2.22	1.14
Child Heart Disease Likelihood	0.42	0.52	1.99	1.15
Child Cancer Likelihood	1.62	0.00	0.25	1.36
Child Stroke Likelihood	2.24	0.87	0.25	1.46
Child Diabetes Likelihood	0.25	0.07	1.19	1.00
Child Obesity Likelihood	3.50	1.44	2.58	2.93

*p<.05

Analyses testing the rural/urban X Latino status X insurance status found three significant 2-way interactions and one significant 3-way interaction regarding mental

health related variables. Anxiety likelihood was predicted by the Latino status X insurance status interaction (F=5.49, p=.02). Follow-up analyses (LSDmmd=0.38) demonstrated that non-insured non-Latinos (M=1.81) had higher scores than all other groups. Non-insured Latinos (M=.93) had greater scores than insured Latinos (M=1.33). Insured non-Latinos (M=1.23) were not significantly different than either Latino group.

Table 7. Factorial ANOVA Rural/Urban X Latino Status X Insurance Status Effects on Mental Health

Variable	Rural/Urban X Latino	Rural/Urban X Insured	Latino X Insured	3-Way Interaction
PSS	0.24	0.23	0.70	2.24
Likelihood of Seeing Mental Health Professional if Participant Had a Serious Mental/Emotional Problem	0.80	0.04	1.77	0.37
Comfortable Seeing Mental Health Professional if Participant Had a Serious Mental/Emotional Problem	0.27	2.51	0.01	0.04
Embarrassed Seeing Mental Health Professional if Participant Had a Serious Mental/Emotional Problem	0.80	0.04	1.77	0.37
Comfortable with Child Seeing Mental Health Professional if Child Had a Serious Mental/Emotional Problem	0.46	2.07	0.51	0.00
Embarrassed with Child Seeing Mental Health Professional if Child Had a Serious Mental/Emotional Problem	0.22	0.05	0.89	0.04
Anxiety Likelihood	0.51	0.01	5.49*	2.10
Depression Likelihood	2.88	0.04	6.73*	2.76
Child Anxiety Likelihood	1.33	0.19	2.63	4.68*
Child Depression Likelihood	7.08*	0.00	7.72	2.25
*p<.05				

Depression likelihood was predicted by the Latino status X insurance status interaction (F=6.73, p=.01). Follow-up analyses (LSDmmd=.386) demonstrated that non-insured non-Latinos (M=1.86) had greater scores than insured non-Latinos (M=1.30) and non-insured Latinos (M=.99). Insured Latinos (M=1.53) had greater scores than their non-insured counterparts.

Child depression likelihood was predicted by the Latino status X insurance status interaction (F=7.08, p=.01). Follow-up analyses (LSDmmd=.26) found that urban Latinos had the highest scores (M=1.10) of all groups. Rural non-Latinos (M=.77) had

greater scores than their Latino counterparts (*M*=.50). There were no differences between non-Latinos from urban areas (*M*=.63) and rural areas (*M*=.77).

Table 7. Factorial ANOVA Rural/Urban X Latino Status X BMI Category Effects on Physical Health

Variable	Rural/Urban X Latino	Rural/Urban X BMI	Latino X BMI	3-Way Interaction
Weekly Soda Pop	1.56	0.34	0.13	0.17
Weekly Child Soda Pop	0.69	0.58	2.85	0.09
Weekly Fried Foods	5.39*	2.43	0.85	0.40
Weekly Child Fried Foods	2.22	0.51	1.60	0.09
Days Exercised	0.39	0.93	0.49	0.39
Child Days Exercised	1.05	1.51	1.01	2.81
Eating Barriers	0.03	0.92	0.39	0.79
Eating Benefits	0.57	0.37	1.58	0.81
Exercise Barriers	0.11	0.06	0.11	0.32
Exercise Benefits	1.16	1.61	1.14	0.11
Child Eating Barriers	3.93*	2.76	0.18	0.57
Child Eating Benefits	0.25	0.08	0.71	0.15
Child Exercise Barriers	0.10	1.00	0.32	0.91
Child Exercise Benefits	0.07	0.53	0.30	0.06
Travel Time	3.35	1.01	0.28	1.50
Feel Respect by Doctors	1.16	2.18	1.20	0.83
Doctors Spent Time With Participant	0.11	0.55	1.63	1.54
Doctors Involved Participant with Decisions	1.30	1.61	0.28	1.30
Adhere to Doctor's Advice	0.22	0.14	1.58	0.93
Adhere to Medication Regimen	0.10	0.41	1.98	0.26
Overall Level of Healthcare Satisfaction	0.06	1.11	1.04	0.32
High BP Likelihood	0.00	0.09	0.57	0.12
Heart Disease Likelihood	0.22	0.14	0.06	0.05
Cancer Likelihood	0.05	3.13*	0.24	0.68
Stroke Likelihood	0.03	1.53	1.04	1.48
Diabetes Likelihood	0.61	0.03	0.43	0.73
Child High Blood Pressure Likelihood	0.46	2.01	0.25	0.29
Child Heart Disease Likelihood	0.22	1.81	2.27	0.12
Child Cancer Likelihood	0.10	2.19	4.16*	0.82
Child Stroke Likelihood	2.40	0.85	0.60	0.11
Child Diabetes Likelihood	0.01	0.21	0.26	0.60
Child Obesity Likelihood	1.91	0.92	0.79	0.43
*p<.05				

Child anxiety likelihood was predicted by the 3-way rural/urban X Latino status X insurance status interaction (*F*=4.68, *p*=.03) (see Figure 11). Follow-up analyses (LSDmmd=.254) found that among rural people, non-insured non-Latinos (*M*=.57) had

greater scores than insured non-Latinos (*M*=.37) and lesser scores than non-insured Latinos (*M*=.84). Rural non-insured Latinos (*M*=.84) had greater scores than their insured counterparts (*M*=.49). Among urban participants, insured Latinos (*M*=1.17) and non-insured non-Latinos (*M*=1.06) had greater scores than insured Latinos (*M*=.57) and non-insured Latinos (*M*=.61).

Analyses testing the rural/urban X Latino status X BMI Category found several significant interactions regarding physical health related variables. The rural/urban X Latino status interaction predicted child eating barriers (*F*=3.93, *p*=.049). Follow-up analyses (LSDmmd=.455) found that urban Latinos (*M*=2.14) had the highest level of child eating barriers, followed by urban non-Latinos (*M*=1.31), rural non-Latinos (*M*=.86), and rural Latinos (*M*=.75). There was no statistically significant difference between rural groups.

Table 8. Factorial ANOVA Rural/Urban X Latino Status X BMI Category Effects on Mental Health

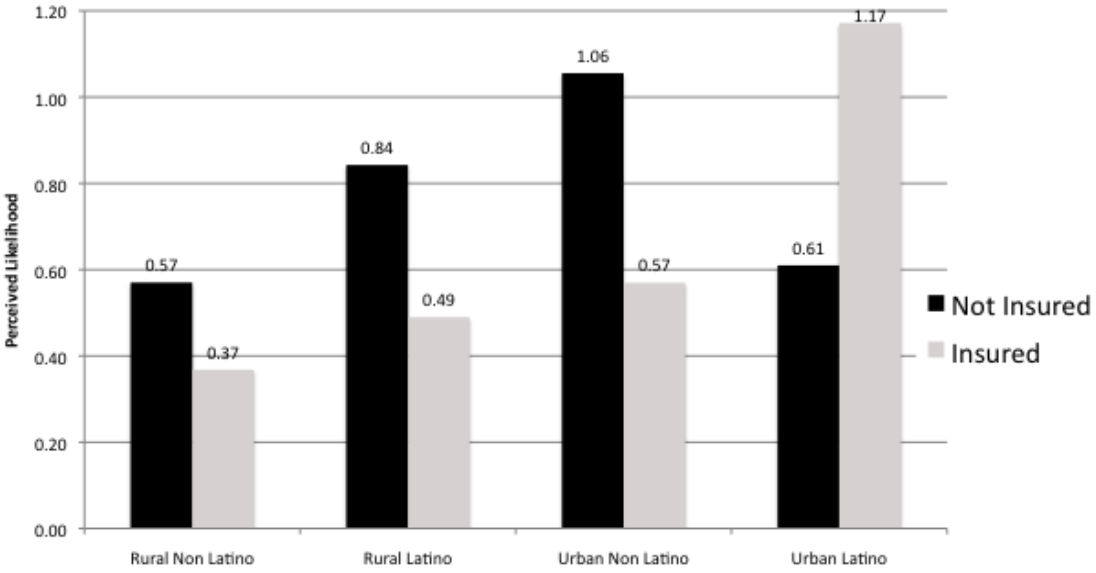
Variable	Rural/Urban X Latino	Rural/Urban X BMI Category	Latino X BMI Category	3-Way Interaction
PSS	0.88	0.01	0.66	0.80
Likelihood of Seeing Mental Health Professional if Participant Had a Serious Mental/Emotional Problem	2.55	0.09	0.26	3.61*
Comfortable Seeing Mental Health Professional if Participant Had a Serious Mental/Emotional Problem	0.80	1.47	3.40*	4.10*
Embarrassed Seeing Mental Health Professional if Participant Had a Serious Mental/Emotional Problem	0.00	0.54	1.03	1.69
Comfortable with Child Seeing Mental Health Professional if Child Had a Serious Mental/Emotional Problem	0.07	0.57	0.34	1.24
Embarrassed with Child Seeing Mental Health Professional if Child Had a Serious Mental/Emotional Problem	0.15	1.12	0.52	0.21
Anxiety Likelihood	0.37	0.44	0.10	2.29
Depression Likelihood	0.00	0.12	0.54	3.52*
Child Anxiety Likelihood	0.05	0.03	0.53	1.12
Child Depression Likelihood	3.17	0.26	0.69	0.85
*p<.05				

There was a significant rural/urban X Latino status difference in the number of fried foods consumed per week (*F*=3.93, *p*=.049). Follow-up analyses (LSDmmd=.414)

found that among rural persons, non-Latinos had less weekly fried foods than Latinos and there were no differences between urban non-Latinos and urban Latinos.

There was a significant rural/urban X BMI Category interaction predicting one's belief regarding cancer likelihood (F=3.13, p=.046). Follow-up analyses (LSDmmd=.36) found that overweight urban persons (M=1.53) had higher scores than all other groups. There were no other significant differences.

Figure 11. Rural/Urban X Latino Status X Insurance Status Effects On Likelihood of Child Anxiety

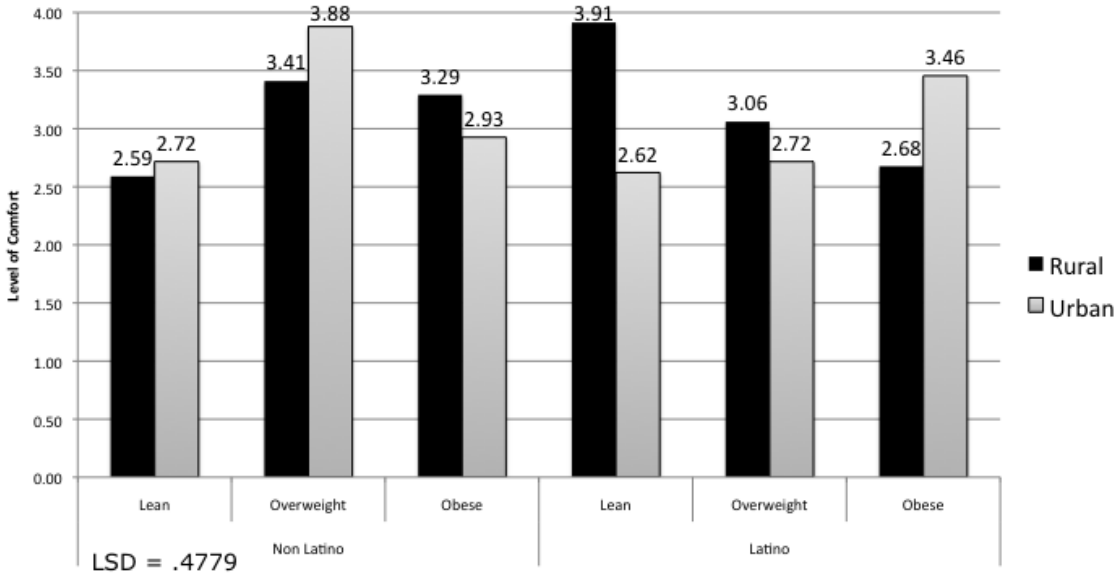


LSDmmd = 0.2540

There was a significant rural/urban X BMI Category interaction predicting one's belief regarding their child's cancer likelihood (F=4.16, p=.02). Follow-up analyses (LSDmmd=.32) found that among non-Latinos, lean person (M=.98) had greater scores than overweight (M=.44) and obese (M=.56) persons. Among Latinos, obese persons (M=.84) had greater scores than lean persons (M=.39), but not overweight persons (M=.65).

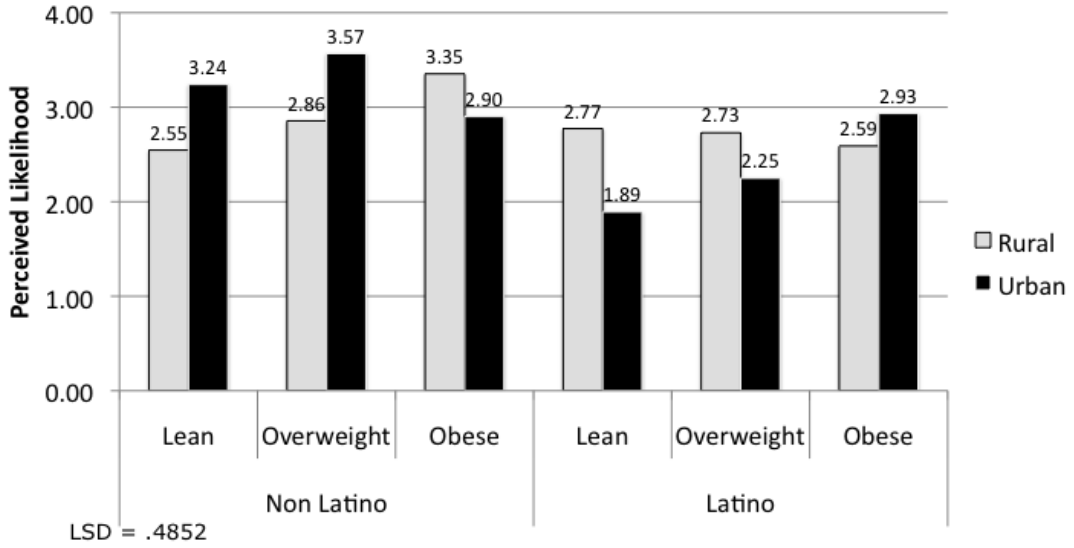
There were several significant rural/urban X Latino status X BMI Category interactions predicting mental health related variables. There was a significant 3-way interaction effect in the level of comfortableness in talking with a mental health professional if experiencing a significant mental/emotional problem (F=4.10, p=.018) (Figure 12). Follow-up analyses (LSDmmd=.478) demonstrated the pattern of these differences. Among rural non-Latinos, obese (M=3.29) and overweight (M=3.41) persons had higher scores than lean persons (M=2.59); there was no difference between overweight and obese persons. Among rural Latinos, lean persons (M=3.91) had higher scores than overweight (M=3.06) and obese (M=2.68) persons; there were no differences between the overweight and obese. Among urban non-Latinos, overweight persons (M=3.88) had higher scores than the lean (M=2.72) and obese (M=2.93); there was no difference between lean and obese persons. Among urban Latinos, obese persons (M=3.46) had higher scores than lean (M=2.62) or overweight persons (M=2.72).

Figure 12. Rural/Urban X Latino Status X BMI Category Effects On Comfortableness Seeing a Psychologist



There was a significant 3-way interaction predicting the likelihood of seeing a mental health professional if experiencing a significant emotional/mental problem (*F*=3.61, *p*=.029) (Figure 13). Follow-up comparisons (LSDmmd=.397) found than among rural and urban non-Latinos, obese persons (*M*=3.35 and *M*=2.90 respectively) had higher scores than those who are lean (*M*=2.55 and *M*=3.24 respectively) and overweight (*M*=2.86 and *M*=3.57 respectively); there was no difference between the lean and overweight. Among rural Latinos, there were no statistically significant differences. Among urban Latinos, lean persons (*M*=1.89) had lower scores than obese persons (*M*=2.93); there were neither differences between overweight (*M*=2.25) and obese persons nor overweight and lean persons.

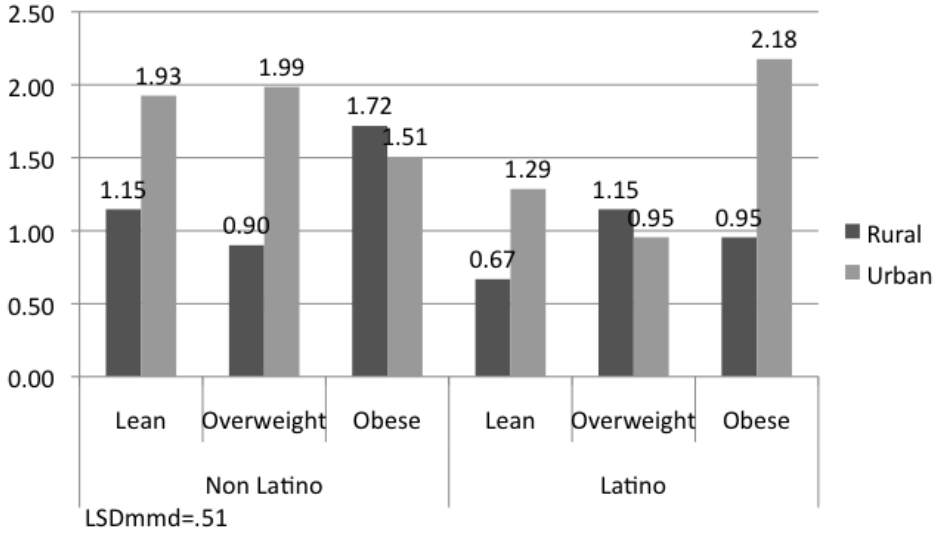
Figure 13. Rural/Urban X Latino Status X BMI Category Effects On Likelihood of Seeing a Psychologist



There was a significant 3-way interaction predicting the one's belief of depression likelihood (*F*=3.52, *p*=.03) (see Figure 14). Follow-up analyses (LSD=.51) found that among rural non-Latinos, obese persons (*M*=1.72) had greater scores than overweight (*M*=.90) and lean (*M*=1.15) persons. Among rural Latinos, there were no significant differences. Among urban non-Latinos, there were no significant differences. Among

urban Latinos, obese persons (*M*=2.18) had greater scores than overweight (*M*=.96) and lean (*M*=1.29) persons.

Figure 14. Rural/Urban X Latino Status X BMI Category Effects On Perceived Likelihood of Depression



Chapter 5: Discussion

Based on the findings, the relationship between health beliefs and health-related behaviors is complex and multifaceted. Consistent with a socioecological perspective, links between health beliefs and health behaviors are influenced by interpersonal (family, culture), organizational (insurance status), community (rural/urban), and public policy level factors (Green, et al., 1996; Richard, et al., 1996; Sallis & Owen, 1997). The results provide supportive evidence regarding the application of personal and parental health belief models within a low-income population.

Although the full model (Figure 3) did not fit, effects in both personal and parental models suggest belief transmission. When viewed from a social learning perspective, patterns of the results suggest an inherent transgenerational health belief system from which conclusions can be drawn upon. There is strong evidence suggesting adults develop health behavior practices during childhood (Birch, 1999; Moller, et al., 1994; Klesges, et al., 1995; Whincup, et al., 2002), which then predict subsequent adult health outcomes (Brewer, et al., 2007; Brewer & Fazakes, 2007; Painter, et al., 2008 ; Winfield & Whaley, 2002; Sedlak, et al., 2007). Also, parents are seen to be the strongest social learning agents who directly teach behaviors and practices, but also indirectly teach their children by filtering cultural and psychological stimuli their child is exposed to (Kozulin, 2003).

The most notable results from this study provide an additional preemptive step in the cycle between parent-child health transmission: parental perceived stress. Parents'

perceived stress presented as a significant direct and indirect predictor of negative child health behaviors via parental health beliefs. The results provide further insight into the underlying mechanisms contributing to health disparities among low-income persons due to perceived stress (see Baum, Garofalo, & Mali, 2006). Meaning, health is impacted by stress both physically due to the corrosive physiological effects of the stress-response system (Troxel, Matthews, Bromberger, & Sutton-Tyrrell, 2003; Matthews, Owens, Kuller, Sutton-Tyrrell, Lassila, & Wolfson, 1998; Steptoe, Donald, O'Donnell, Marmot, & Deanfield, 2006), but also by unhealthy behavioral choices made in response to stress (Oliver & Wardle, 1999; Steptoe, Lipsey, & Wardle, 1998). The results from this study show that behavioral choices regarding health behaviors are accounted for, in part, by health beliefs. Overall, parents' stress levels impact not only their personal health and health-related beliefs, but also the health-related beliefs and behaviors of their children.

These results illustrate the use of the HBM on a diverse low-income sample as a means of determining the underlying architecture of health, as seen in a wealth of prior studies (see Stretcher & Rosenstock, 1997; Connor & Norman, 1996; Painter, et al., 2008; Sherman, et al., 2008; Clark & Becker, 1998; Juniper, et al., 2004; Brewer, et al., 2007; Winfield, et al., 2002; Sedlak, et al., 2007). Merging literature regarding susceptibilities to poor child health outcomes with the personal HBM, this study then inspected the roles of parental health beliefs have regarding their children's health behaviors and results demonstrate a multipart blueprint predicting children's health outcomes. To date, this study offers two novel broad conclusions. First, the use of latent variable structural equation modeling can provide a sound statistical approach in analyzing and interpreting the causal, associative, and mediating factors entailed in a

health belief model. Second, the schematic organization of personal and parental health beliefs can differ based on socioecological grouping variables.

A more comprehensive discussion of the results from this study represent two types of main analyses, personal and parental health beliefs, both of which account for socioecological variables (e.g. Latino status, insurance status, urban/rural status). They will be presented as follows. First, the personal health belief models and follow-up examinations of group interactions on variables associated with personal health behaviors and health beliefs will be discussed. Second, the parental health belief models and follow-up examinations of multi-level socioecological variable interactions on variables associated with parental health beliefs and the health behaviors of their children will be explored. Then, limitations will be addressed. Lastly, the implications of study results will be explored.

The Individual Level: Understanding Personal Health Beliefs

Though the full personal-parent HBM did not converge, the personal and parental HBM's converged when modeled separately. Consistent with prior research identifying diabetes, high blood pressure, and obesity as the greatest health concerns of low-income persons (Dammann & Smith, 2009). The most parsimonious modeling of the personal health beliefs model was modified to include disease likelihood and disease severity pertaining to these three health risks. When examining the responses from all participants, greater perceived stress predicts greater levels of healthy eating and exercise barriers, greater disease likelihood, lesser adherence to doctor's advice, and lesser adherence to medication regimen. These findings are consistent with literature indicating that stress is a strong predictor of disengagement of positive health activities (Bottonari,

et al., 2005) and decline in self-rated health among low-income persons (Orpana, et al., 2007). Adults who report elevated perceived stress are more likely to experience negative cognitions, which feedback into and exacerbate the feelings of stress (Ingram, Miranda, & Segal, 1998). In the present study, this pattern was evidenced with negative health-related cognitions (i.e. greater perceived barriers, lack of benefits, thoughts of disease inevitability). The behavioral consequence of stress was shown with decreased adherence to medical advice. Taken together, stress operates as a catalyst to negative health beliefs and a causal agent of medical nonadherence. Coinciding with the results linking stress to increased perception of healthy eating and exercise barriers, research indicates that not only do low-income persons report more perceived stress, they also report that stress interferes with a third of family meal preparation (Almeida, Wethington, & Kessler, 2002).

Greater disease severity and feeling respected by doctors also predicted greater self-reported adherence to doctor's advice. Whereas, greater feelings of respect from doctors and involvement with doctor's decisions predicted greater self-reported medication adherence. Lesser perceived time spent with doctors predicted lesser disease severity. These results are consistent with prior findings indicating the time and quality of time spent with a physician are strong predictors of treatment compliance (DiMatteo, 1994). When a participant perceives a greater degree of disease severity, the personal actions to manage the disease risks (i.e. medical adherence) increase (see DiMatteo, Haskard, & Williams, 2007). Greater disease likelihood predicted greater BMI, indicating that a person with increased BMI recognized greater risk for disease diagnosis.

Based on these pathways, the quality of patient-provider communication has the potential to impact not only health outcomes directly, but indirectly through health beliefs. Poorer patient-provider communication, as evidenced by perceptions of inadequate time spent with doctor, lead to lesser perceived disease severity. Because greater disease severity predicts greater adherence to doctor's advice, deceased perception of adequate time with a provider may indirectly contribute to infrequent or lack of adherence to doctor's advice. Evidence suggests that patients' perception of time spent with physicians is less when they perceive lower quality of an appointment (Cape, 2002).

The results from this study linking perceived time with physicians and adherence support prior research examining physicians' efficacy during clinical visits. When providers spend more time with their patients, they report being more likely to develop a better patient-provider relationship and engage in more effective communication (Zyzanski, Strange, Langa, & Flocke, 1998; Flocke, Miller, & Crabtree, 2002; Goedhuys & Rethans, 2001). Providers who spent small amounts of time (as little as 5 seconds) building rapport with their patient had higher patient satisfaction (Gross, Zyzanski, Borawski, Cebul, & Strange, 1998; Eide, Graugaard, Holgersen, & Finset, 2003). When physicians asked patients to voice their concerns, appointments lasted, on average, 6 second longer according to one study (Marvel, Epstein, Fowers, & Beckman, 1999) and in other studies, had no significant time differences (Mauksch, Hillenburg, & Robins, 2001; Henbest & Fehrsen, 1992). In both the Mauksch et al. (2001) and Henbest & Fehrsen (1992) studies, patients reported greater satisfaction and better resolution of their concerns when their physicians elicited patient disclosures. Taken together, perceived

time with physicians appears to be influenced by physicians' effectiveness and rapport-building skills, which then can impact subsequent healthcare adherence.

The Interpersonal Level: Understanding Non-Latino and Latino HBM Structures. The structural design of the individual-level personal health beliefs changed when modeling non-Latinos and Latinos separately. Among both non-Latinos and Latinos, greater disease likelihood predicted greater BMI. This demonstrates that persons who are overweight or obese are aware of their susceptibility to obesity, hypertension, and diabetes. Greater perceived stress predicted greater barriers to eating healthy and exercising, supporting postulation for a link between stress and decreased adherence to physical activity (Oman & King, 2000) especially among low-income mothers (Chang, Nitzke, Guilford, Adair, & Hazard, 2008) and unhealthy food consumption (Wallis & Hetherington, 2009; Zellner, Loaiza, Gonzalex, Pita, Morales, Pecora, et al., 2006). Greater feelings of being respected by doctors predicted greater adherence to doctor's advice, as has been found in prior studies examining adherence to preventative (Beach, Sugarman, Johnson, Arbelaez, Duggan, & Cooper, 2005).

Among non-Latinos, several multi-step pathways linked the precursors and consequences of health beliefs. Less time with physicians predicted greater beliefs of disease likelihood, and greater disease likelihood predicted greater BMI. Greater perceived stress predicted greater perception of eating and exercise barriers, which then predicted greater BMI. Greater feelings of being involved with the doctor's decisions predicted greater disease severity, which then produced greater medical adherence. Earlier research specifies that patients not only desire a more active role in their healthcare, but have better outcomes when this is achieved (Kaplan, Greenfield, & Ware,

1989). Feeling respected by doctors also predicted greater medical adherence. These results signify the role of physicians in the health of their non-Latino patients. It appears that increasing awareness to disease severity, which can be done during medical visits, has the ability to change cognitions regarding actions to engage in positive health behaviors, as found in a meta-analysis performed by Milne and colleagues (2000), whereas the effects of likelihood does not.

It appears that when non-Latino participants do not spend time with their physicians, feelings that a disease may be highly likely, inevitable, or uncontrollable may be elicited. Harkening back to social-cognitive theories (Rotter, 1954), one's locus of control regarding future disease risk may thwart future engagement in positive health behaviors. For example, results from the 2003 Health Informational National Trends Survey found that people who have fatalistic (external locus) beliefs regarding cancer (e.g. it seems like almost everything has cancer; there's not much people can do to lower their chances of getting cancer; and there are so many recommendations about preventing cancer, it's hard to know which ones to follow) were less likely to exercise weekly, eat five or more fruits and vegetables daily, and were more likely to smoke (Niederdeppe & Levy, 2007). Patient-provider communication enhancing patient's beliefs regarding their ability to prevent and treat negative health outcomes has been regarded as an important aspect of healthcare (see Marks, Allegrante, & Lorig, 2005).

Among Latinos, several differences from their non-Latino counterparts were observed. Stress emerged as a significant catalyst of negative health behaviors. Greater levels of perceived stress predicted lesser adherences to doctor's advice and medication regimens, as well as greater perceptions of eating and exercise barriers. The attribution of

psychosocial stressors to somatic health complaints is more likely to occur among Latinos (Samaan, 2000), and many Latinos are reluctant to disclose distressing news to their health care provider, especially as it pertains to negative treatment effects or treatment adherence failure (Castex, 1994). Therefore, patient-provider communication may be hampered by providers who are not aware of these presentational factors, as well specific traditional labels such as *sustos* (fright) and *attaques de vervios* (nervous crisis) (Escobar, 1987). These in turn lead to decreased medical adherence.

Among Latinos, greater disease likelihood predicted greater adherence to doctor's advice; greater involvement with doctor's decisions predicted greater adherence to doctor's advice. Prior research is consistent with the present results, in that Latinos who reported feeling involved with their doctor's decisions had increased levels of adherence (Beach, Sugarman, Johnson, Arbelaez, Duggan, & Cooper, 2005). These results also demonstrate that among non-Latinos, perceived disease severity predicts medical adherence, whereas among Latinos, it is perceived disease likelihood. This suggests the need to investigate possible differences in doctor-patient communication effectiveness among different ethnic groups in future studies, especially as it relates to ethnic differences of health beliefs. Lastly, among Latinos, stress significantly and negatively impact medical adherence. Univariate analyses (see Table 5) showed that Latinos and non-Latinos did not differ significantly in their level of perceived stress, but these analyses show that the effect of stress may be more impactful for Latinos' health as it relates to adherence to medical recommendations.

There are also alternative explanations for these results. First, it could be that Latinos' response style to perceived stress ratings resulted in lower ratings of perceived

stress, however, validation of the Perceived Stress Scale in Spanish with a sample from Mexico did not replicate such findings (Ramírez & Hernández, 2007). Second, the PSS asks participants to rate their experienced stress within the past month, as opposed to chronic stressors or significant lifetime stressors. Researchers have found that ethnic minorities experience more chronic stressors associated with their minority status, and that combined with daily stressors, creates a greater susceptibility to physical and mental health illnesses (Allison, 1998; Harrell, 2000; Turner & Avison, 2003; Williams, Yu, Jackson, & Anderson, 1997). Furthermore, the role of acculturative stress [stress experienced in response to acculturating (Berry, 2003)] has been established to be a significant factor in health disparities of Latinos in the United States (Lara, et al., 2005).

The Organizational Level: Understanding Non-Insured and Insured HBM Structures. The second socioecological grouping variable, insurance status, provided evidence of organizational level effects on the individual level. There were some commonalities between non-insured and insured groups. Among both non-insured and insured persons, greater disease likelihood predicts greater BMI; greater perceived stress predicts greater eating and exercise barriers; and feeling more respect from doctors predicts greater adherence to doctor's advice. Among persons with insurance, greater perceived stress predicts lesser healthy eating and exercising benefits; and less time with doctors predicts greater levels of disease severity. However, unlike the full model, disease severity was not significantly related to subsequent adherence behaviors. Perhaps indicating that among persons with insurance, health beliefs may not be as integral with health behaviors as persons without health insurance.

Among persons without insurance, perceived stress emerged as a significant contributor to health outcomes, both through direct and indirect pathways. Greater perceived stress predicts lesser medical adherence and greater perceptions of disease likelihood and healthy eating/exercise barriers. Disease likelihood then predicts greater BMI. There were no significant mean differences of perceived stress between non-insured and insured persons, indicating that stress is more impactful among persons who do not have health insurance and explains poorer adherence. Consistent with prior literature, these results illustrate that adherence to treatments is decreased due to lack of insurance (Schectman, Schorling, & Voss, 2008; Nelson, Moser, Gaffey, & Waldron, 2009) and thus results in poorer healthcare outcomes (Urban Institute, 2002; Sung, Alema-Mensah, & Blumenthal, 2002; Hsia et al., 2000). Overall, among low-income persons, stress may provide a link between lack of health insurance and healthcare outcomes (Urban Institute, 2002; Sung, et al., 2002; Hsia, et al., 2000), including delay of necessary medical care or failure to obtain medical care (Institute of Medicine, 2001). Lack of health insurance has been shown to impact both lower-income and higher-income adults, as evidenced by significantly decreased use of recommended healthcare services such as cancer prevention, cardiovascular risk reduction, and diabetes management (Ross, Bradley, & Busch, 2006).

Positive predictors of medical adherence may counter the negative impact of perceived stress among persons without health insurance. Greater feelings of respect from doctors and greater disease severity beliefs predicts greater medication adherence; and greater involvement with doctor's decisions as well as feeling respected by doctors predicts greater adherence to doctor's advice. Though increased stress can hinder medical

adherence, effective patient-provider communication, may be able to overcome the negative impact of stress among persons without healthcare insurance. There has been evidenced disparity between those who are insured and those without insurance in regards to patient-provider communication, especially when the patient's preferred language of communication is not English (Clemans-Cope & Kenney, 2007). These differences indicate that among those without insurance, healthcare perceptions and perceived stress play a more extensive role in medical adherence compared with those with insurance. Overall, the lack of health insurance contributes to overall health disparities of low-income persons (see Lillie-Blanton & Hoffman, 2005; see Adler & Newman, 2002), but may have underlying mechanisms (e.g. stress and healthcare perceptions).

The Community Level: Understanding Rural and Urban HBM Structures. Models examining the differences between rural and urban personal HBM were tested in order to examine how the architecture at the individual level is impacted by differences on the community level. Results show some universals shared between rural and urban populations. Among both rural and urban persons, greater disease likelihood predicts greater BMI; greater perceived stress predicts greater eating/exercise barriers. Healthcare perceptions predicted health outcomes in that regardless of community type, greater feelings of being respected by doctors predicts greater adherence to doctor's advice.

Among rural persons, healthcare perceptions predicted health beliefs. Greater involvement with doctor's decisions predicts greater disease likelihood and greater disease severity. Greater disease likelihood then predicted greater BMI. Whereas less time with doctors predicts greater disease severity. However, perception of disease

severity was not significantly related to medical adherence. Physicians who spend more time with their patients are more likely to include lifestyle advice and preventative activities, as well as communicated greater amounts of information regarding (see Wilson and Childs, 2002) and efficient patient-provider communications may be especially crucial in a rural area due to less routine contact with physicians (Larson, et al., 2003). Rural persons with greater feelings of being respected by doctors adhered to their medication more. Feeling respected by healthcare providers, could increase overall trust of providers. Within rural culture, healthcare providers and educators are often met with distrust and seen as outsiders (Bushy, 2000; Lee, 1993), hence why rural persons tend to be self-reliant in regards to their health and will rely on family and neighbors during illness (Weinert & Long, 1993). However, it appears that feeling respected may counter distrust of medical professionals. These models did not demonstrate significant pathways between health beliefs and medical adherence.

Therefore, conclusions can be drawn regarding the contributing influences of health beliefs (e.g. greater involvement with doctor's decisions and less time with doctors), but not medical adherence. Surveys of rural and urban healthcare providers indicate that rural healthcare providers are more likely than their urban counterparts to provide means of integrating community resources and safeguarding patient confidentiality, thus providing added patient-provider communication components (Chipp, Johnson, Brems, Warner, & Roberts, 2008), Though rural providers are less likely to comply with guidelines set forth by the American Diabetics Association regarding glycemic control, blood pressure control, lipid management, and preventative services (Coon & Kulkowsi, 2002).

Among urban persons, greater levels of perceived stress resulted in lesser medication adherence and adherence to doctor's advice. Preliminary analyses found that urban persons report perceived stress levels that are twice as high as their rural counterparts. Therefore, within this tested model, the effects of the amplified perceived stress among urban persons have a significantly negative impact on healthcare compliance. Prior research indicates people residing in low-income neighborhoods experience greater neighborhood problems and stressors (i.e. excessive noise level, dangerous conditions) (Steptoe & Feldman, 2001). Greater neighborhood problems then predicted poorer self-rated health, greater psychological distress, and impaired physical function (Steptoe & Feldman, 2001). The results from the present study reflect that in urban populations, perceived stress is related to poor health outcomes, in part, due to poor medical adherence. Furthermore, because urban persons report greater levels of perceived stress, medical non-adherence is especially problematic within an urban setting. Urban persons experiencing greater involvement with their doctor's decisions reported greater medication adherence. Aside from perceived stress predicting healthy eating and exercise barriers, no other variable provided as predictors to health beliefs.

These differences demonstrate that the health beliefs of rural persons may be more impacted by healthcare perceptions. Univariate analyses revealed lack of differences between rural and urban healthcare perceptions, and therefore, can be presumed to be operating differently given the community group. For example, significant pathways of rural persons found that greater involvement with doctor's decisions predicted greater disease likelihood, and greater disease likelihood predicted

greater BMI. Whereas among urban persons, stress is more likely to negatively impact medical adherence.

Interacting Socioecological Level Effects on Health Disparities. Results from the HBM models demonstrated differences between socioecological grouping variables (e.g. insurance status, Latino status, rural/urban status). Therefore, exploratory analyses examined the architecture of multiple levels (i.e. insured urban Latino) on health behaviors, physical health beliefs, and mental health beliefs. With these results, patterns evidenced within the HBM models emerged to show differential effects of group memberships.

These results indicate that healthcare perceptions (e.g. feeling respected by doctors, feeling that doctors spend adequate time with patient, feeling involved with the doctor's decision making) resulted in greater medical adherence. Feeling respected by a doctor has been shown to significantly impact subsequent adherence to medical advice among non-Latinos and Latinos (Blanchard & Lurie, 2004). Consistent with these prior reports, these analyses show that feeling respected by a doctor impacts adherence to doctor's advice among all tested groups: urban, rural, non-Latino, Latino, non-insured, insured.

However, the patterns of other healthcare perceptions differed across populations. Feeling involved with the doctor's decision was impactful independently for urban, Latino, and non-insured populations. This is consistent with prior research indicating that among persons who lack health insurance, health concerns regarding access to care trump concerns regarding clinical decision making (Institute of Medicine, 2002). In a study assessing a sample of rural and urban providers at twenty sites across four states,

providers reported being able to frequently provide all necessary services 82% of the time for their insured patients, but only 35% of the time for their uninsured patients (Gusmano, Fairbrother, & Park, 2002), reflecting a lower quality of care. Taken together, the results from this study reflects the importance of shared decision making with providers among the uninsured, given that decisions presented may be more limited. Prior research indicates that minority patients, especially those who are not proficient in English, are less likely to be encouraged to participate in medical decision-making (see Ferguson & Candib, 2002). When Spanish-speaking patients have access to interpretive services, their use of clinical services increases, some clinical disparities decrease (i.e. flu immunizations) (Jacobs, Lauderdale, Meltzer, Shorey, Levinson, & Thisted, 2001), and satisfaction increases (Lee, Batal, Maselli, & Kutner, 2002). Physicians' variation in their practices and health disparities may be due, in part, to a lack of patient involvement in treatment decisions. For example, patients who participate in their medical planning have greater adherence, continuity of care, and better clinical outcomes (Hall, Roter, & Katz, 1998; Hall, Horgan, Stein, & Roter, 2002; Kaplan, Greenfield, Gandek, Rogers, & Ware, 1996; Stewart, 1995).

The differences between groups lead to further questions regarding the positive and negative consequences that health beliefs produce. Traditionally seen as positive catalysts of healthy related behaviors (Stretcher & Rosenstock, 1997), some health beliefs may not follow such patterns among different populations. For example, when one perceives disease likelihood as being inevitable or unavoidable, actions to change the trajectory of a negative health conditions may seem fruitless and unworthy of effort. For example, results from the non-insured model indicate that increased perceived stress is

linked with increased disease likelihood, which in turn, is linked with increased BMI. Given this pattern and the added barriers non-insured persons face in regards to receiving medical care (Wilper, Woolhandler, Lasser, McCormick, Bor, & Himmelstein, 2008), having increased disease likelihood, due to perceived stress, may hinder subsequent efforts to eat healthy and exercise.

There were patterns of socioecological interactions regarding health risk behaviors (e.g. soda pop and fried food consumption). Among non-Latinos, rural and non-insured persons had the highest soda pop consumption within a week period compared with their urban non-Latino, insured non-Latino, and Latino counterparts. Consistent with prior research, non-Latinos had greater levels of added sugar intake (i.e. soda pops) than Latinos (Thompson, McNeel, Downling, Midthune, Morrissette, & Zeruto, 2009). There is a lack of prior studies examining urban-rural differences of soda pop consumption, let alone the differences between Latino and non-Latino ruralites and urbanites. However, the results illustrate an added dimension of the dietary practices of low-income, non-insured. Foods with added sugars (i.e. soda pop) within the United States have a low cost-to-energy (dollar/calorie) ratio, and are preferentially selected more often by low-income persons (see Drewnowski, 2007). Households earning the highest 20% of income reported buying higher-quality meats, more seafood, and more fruits and vegetables, whereas lower-income households bought the lower quality meats and less expensive fruits and vegetables (Kaufman, MacDonald, Lutz, & Smallwood, 1997). Low-income persons in rural communities may experience a greater disadvantage to achieving a healthy diet. In rural areas, environmental healthy eating barriers are

increased due to lack of whole-grain products, low-fat-cheese, and lean meats within small grocery stores (Jetter & Cassady, 2005).

Related, differentiating patterns regarding fried food consumption emerged. Both rural and urban Latinos, and urban Non-Latinos had significantly greater consumption of weekly fried foods compared with rural non-Latinos. These findings illustrate the congruence in the beliefs-to-actions differences. Rural non-Latinos report lower fried food consumption and lower barriers to healthy food consumption, showing a congruent relationship between beliefs and behaviors. Similarly, Urban Latinos reported higher consumption of fried foods and higher barriers to healthy eating. Part of this variance could be attributed to the higher availability of fast-food restaurants per capita within urban areas (Powell, Chaloupka, & Bao, 2007). Greater access to fast-food restaurants is not only associated with obesity, but is amplified within low-income neighborhoods (Diez-Roux, Nieto, Caulfield, Tyroler, Watson, & Szklo, 1999; Kahn, Tatham, Pamuk, & Heath, 1998). Within low-income neighborhoods, there is less access to supermarkets, and instead, independent stores fill the niche of food distribution (MacDonald & Nelson, 1991; Chung & Myers, 1999; Morland, Wing, Diez-Roux, & Poole, 2002). Unfortunately, independent stores charge higher prices (Chung & Myers, 1999), thus leaving consumers more prone to engage in unhealthy dollar-to-calorie food choices (see Drewnowski, 2007). These results are consistent with prior study findings examining acculturated Latinos. Prior results found that acculturated Latinos eat more fried foods and less fruit. Furthermore, as socioeconomic status decreased, so did low-fat dietary practices (Murphy, Castioo, Martorell, & Mendoza, 1990).

Results from this study indicate differences in beliefs across interacting socioecological variables. For example interaction effects revealed differences perceived cancer likelihood. Overweight urban persons reported the highest perceptions of cancer likelihood, but lean non-Latinos reported the highest perception of cancer likelihood for their children. More research examining these differences is needed to examine the mechanisms underlying this pattern.

Effects showed interacting socioecological levels on the perception of mental health variables. Non-insured non-Latinos had the greatest level of perceived likelihood of both anxiety and depression than all other groups. Among Latinos, those who report being insured had higher perceived likelihoods of depression and anxiety. Prior research indicates that among insured Latinos, limited English ability was a barrier to receiving mental health treatment (Sentell, Shumway, & Snowden, 2007) and may partly explain this difference.

Urban obese Latino persons perceived the greatest likelihood of depression, comfortableness with seeing a mental health professional, and likelihood of seeing a mental health professional when experiencing a significant mental/emotional problem. Given the urban data sites had integrated behavioral medicine services with Spanish-interpreters, it is plausible that exposure to or referrals for psychological services is increased among the Latino urban obese persons. An alternative explanation could be that the recognition of depression susceptibility coincides with the increased likelihood of seeking mental health services among an obese sample (Trakas, Lawrence, & Shear, 1999).

From 1987 to 1997, Latinos experienced proportionally greater increases in outpatient treatment for depression compared with black and white persons, however, the rate of treatment was still significantly less than whites (Olfson, Marcus, Druss, Elinson, Tanielian, & Pincus, 2002). And those without insurance were less likely to receive such treatment (Olfson, et al., 2002). Therefore one explanation for this study's findings could be that insurance status raises awareness (and thus perceived susceptibility) for Laitnos, but among non-Latinos, the awareness of psychological illness is more prevalent and thus those who are uninsured are, to some degree, aware of their decreased likelihood of receiving treatment.

In total, examining health beliefs and behaviors based on interacting socioecological variables demonstrated patterned differences, reflecting different mechanisms of health disparities. Among non-insured people, non-Latinos reported greater likelihood of mood disorders, whereas among insured people, Latinos reported greater likelihood of mood disorders. Furthermore, univariate analyses showed that Latinos had greater fried food intake per week, but when stratifying ethnic groups across rural and urban categories, the difference was seen for only within a rural area, whereas urban Latinos and non-Latinos had similar levels of fried food intake. Similarly, soda pop intake was shown to be higher among non-Latinos, but when stratifying these results across rural/urban status, this increase was seen only among rural parents.

Understanding Parental Health Beliefs

Prior research indicates that parents can directly affect their children's health behaviors by engaging them in health behaviors (i.e. food selection, meal timing, portion sizes) (Birch & Fisher, 1998; Nicklas, et al., 2001; Birch & Fisher, 1995). Indirectly,

parents impact their child's health behaviors by providing as role models for health behavior. For example, children whose parents are habitually physically active engage in more hours of exercise and active play (Fogelholm, Nuutinen, Pasanen, Myohanen, & Saatela, 1999). Therefore, the following discussion of the parental HBM will provide preliminary evidence that demonstrates how parental health choices are made and impact child health, and provides evidence of belief transmission.

When modeling parental health beliefs as a latent variable composed of two latent variables (child disease likelihood and child disease severity) and two non-latent variables (child's healthy eating barriers and child's healthy eating benefits), child's disease severity did not significantly load onto the child health beliefs latent variable. Indicating that parent's perception of disease severity may be an unnecessary consideration within the context of the model's parameters. Greater parental BMI and perceived stress predicted greater levels of parental health beliefs, which in turn, predicted greater numbers of soda pops consumed by their children, but not number of fried foods. Meaning, that parents who identify a high level of health eating barriers, a low level of healthy eating benefits, and a high level of disease likelihood for their children were more likely to have higher BMI and higher levels of perceived stress. It was these beliefs that predicted subsequent high levels child soda pop consumption. Essentially the link between parents' BMI and stress levels with beverage choices for their children is mediated via their parental health beliefs. Prior evidence has shown that 10-15% of total calories consumed by children and adolescents within the United States are derived from sweetened beverages (Wang, Bleich, & Gortmaker, 2008) and parental BMI is strongly correlated with child BMI (Fogelholm, et al., 1999).

In order to examine which specific health beliefs contributed to the above results, the use of a child health beliefs latent variable was dropped, leaving two-latent variables (child disease likelihood and child disease severity) and two non-latent variables (child's healthy eating barriers and child's healthy eating benefits) that were examined independently of each other. Greater parental BMI predicted greater beliefs regarding child disease likelihood and disease severity, whereas greater perceived stress predicted greater child eating barriers and greater number of soda pops consumed by children. By examining each belief as a separate factor, the results indicate that parents' perceived stress is related more to children's health behaviors (i.e. soda pop consumption and fried food consumption), whereas parental BMI impacts beliefs regarding their child's likelihood and severity of experiencing a chronic disease.

Follow up analyses examined the interactions of multiple socioecological levels on specific parental physical and mental health beliefs. Both non-Latinos and Latinos in rural areas, as well as non-Latinos in urban areas reported lower barriers to their children's healthy food consumption. Whereas urban Latinos reported the highest number of barriers to their children's healthy food consumption. In prior studies, low-income urban Latino children had poor diet quality (Wilson, Adolph, & Butte, 2009). Urban Latinos may also experience greater levels of perceived child healthy eating barriers also, in part, due to acculturation factors. Latino children's dietary quality has shown to decrease as they assimilate into 'mainstream US culture.' (Wilson, et al., 2009; see Ayala, Baquero, & Kinger, 2008).

Urban Latinos had the highest perceived likelihood that their child would experience depression and anxiety than their rural counterparts and non-Latinos of both

urban and rural settings. Part of this difference could be attributed to the higher levels of perceived stress among urbanintes within this sample. Among urban Latinos, those with insurance perceived the highest likelihood of their child experiencing anxiety. Whereas the non-insured urban non-Latinos, rural Latinos, and rural non-Latinos had higher perceived likelihoods of their child experiencing anxiety than their insured counterparts. Most children who are in need of mental health evaluations do not receive such services, Latino and uninsured children being those most prone to this disparity (Kataoka, Zhang, & Wells, 2002). Therefore, these findings illustrate potential differences between mental health disparities and one's perceived susceptibility to mental health problems. The results indicate that insurance status may affect Latinos' and non-Latinos' perception of mental-health problems for both themselves and their children in different ways in that insurance increases likelihood beliefs for Latinos, but among non-Latinos, it is the absence of health insurance that raises the likelihood of emotional or mental problems.

Understanding Health Transmission

Comparing the personal and parental HBM within the socioecological framework, some parallels are presented. First, perceived stress impacted both health beliefs and health behaviors. Regardless of socioecological context, perceived stress appears to have the strongest relationship with perception of healthy eating and exercising barriers within the parental and the personal HBM's.

Perceived stress impacted health outcomes negatively. For children, increased parental stress is associated with increased child soda pop consumption, and the relationship between parental health beliefs and child soda pop consumption was accounted for, in part, by perceived stress. The role of parental stress could exacerbate

the risk for child obesity indirectly within a low-income population. Prior research indicates that low-income preschool children at risk for being overweight (BMI 85th-95th percentile) who consumed at least one soda pop a day were twice as likely to become overweight compared to their at-risk counterparts who did not drink soda pop at a 1-year follow-up (Welsh, Cogswell, Rogers, Rockett, Mei, Grummer-Strawn, 2005). For parents, greater levels of perceived stress resulted in poorer health behaviors as evidenced by decreased medical adherence. Though it is unknown how parental adherence to their child's medical adherence was affected by stress in this study, prior findings indicate that parents of children with diabetes who perceive greater stressors are less likely to perceive their child's medical care as being satisfactory, which in turn, predicts lower adherence to the diabetes treatment regimen (Auslander, Thompson, Dreitzer, & Santiago, 1997).

The role of parental BMI also emerged as a significant factor within the personal and parental HBM models regardless of socioecological context. Personal disease likelihood predicts parental BMI, and parental BMI then predicts parents' perceived likelihood of their children experiencing chronic illnesses and the severity of such chronic illnesses. Meaning, when parents' weight is increased, they perceive greater risk of being diagnosed with chronic illness. These beliefs are mirrored in the beliefs they have regarding their child's vulnerability to chronic disease as well. These results map onto a previous studies assessing the beliefs of low-income parents with obese preschool-age children. The majority of parents with obese children do not perceive their child as being obese (Myers & Vargas, 2000; Carnell, Edwards, Coker, Boniface, & Wardle, 2005). Though the majority also describe having knowledge that overweight children are prone to develop heart problems as adults (Myers & Vargas, 2000) and are more likely to

express concern that their overweight child may become overweight in the future (Carnell, et al., 2005). This level of concerns was higher for obese children than overweight children, as well as higher for parents who were themselves overweight or obese (Carnell, et al., 2005). Taken together, prior research and present research suggest a parental awareness of their child being overweight or obese, but an unwillingness to endorse this on self-report measures. For example, from this study, there was a significantly low base rate of parental endorsement of child's obesity. When asked how parents attempt to control their child's weight, less than 4% considered giving their children less sugar-added beverages (i.e. soda pop) (Myers & Vargas, 2000). Via the health beliefs tested in the present study, parental BMI also predicted their children's soda pop intake. Based on prior evidence (Myers & Vargas, 2000), curbing or ceasing soda pop consumption in the house may not be recognized as an effective means of controlling a child's weight.

Limitations

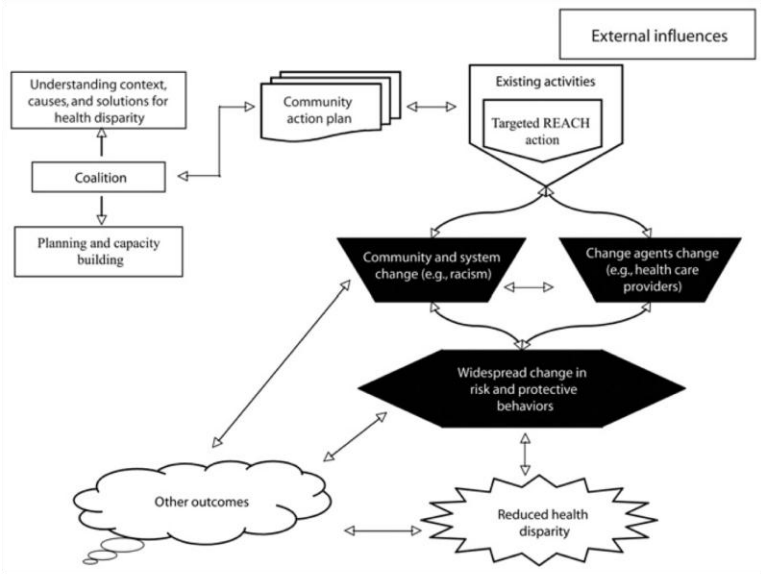
The span of this study did present with some areas of weaknesses. While the sample size testing the personal-parental health beliefs model (Figure 3) had more than the requisite 200 participants, the lack of data convergence suggests a greater sample size is needed to test this model. Researchers identify 200 participants as being a critical and adequate SEM sample size (Garver and Mentzer, 1999; Hoelter, 1983), others have proposed a value of 10 participants for every free estimated parameter (Schrieber, Nora, Stage, Barlow, & King, 2006). Therefore, a larger data size may allow data convergence. Second, this study's Latino participants were primarily immigrants from Mexico. Prior evidence indicates that Latino health is multidimensional, and includes several within-

group differences among different country-of-origins and immigrant status (see Vega, Rodriguez, & Gruskin, 2009). Therefore, extended studies would benefit from having participants of varying Latino sub-groups. Third, the results of this study represent a cross-sectional means of design. Given shifting national and state policies and the continual change of the American culture, it is unknown how these results will change across time, and if so, the effects that these changes will have on overall health and healthcare. Fourth, the use of data sites was limited to voluntary participation by clinical directors. As a result, the two rural data sites were located at state-funded public health departments, whereas the two urban sites included federally qualified healthcare centers that are primary care facilities. Future studies may gain additional architectural differences of beliefs given place of data collection. Fourth, adherence to medication and doctor's advice was measured via self-report. Evidence suggests that the concordance between self-reported adherence to medication and nonself-report measures of adherence (i.e. administrative claims, pill count or canister weight, plasma drug concentration, electronic monitors) varies widely (see Garber, Nau, Erickson, Aikens, & Lawrence, 2004). Therefore, a nonself-report measure of adherence may reflect a more accurate measure of actual adherence. Lastly, the scope of this study did not address the specific role of acculturative stress on health. The majority of Latino participants preferred Spanish and identified themselves as immigrants, thus eliminating variability and subsequent comparison for the two most practical (although imperfect) proxy variable to acculturation (Lara, et al., 2005). Future studies should focus on acculturative stress, acculturation, and rural/urban differences.

Implications of Study Results

Results from the analyses provide further information for clinicians and public health officials to formulate and provide more tailored information for their patients based on health beliefs, group identifications, and mental health factors. Literature reviews report the importance of culturally-tailored interventions (Davis, Vinci, Okwuousa, Chase, & Huang, 2007; Masi, Blackman, & Peek, 2007), however, the availability of such developed and tested interventions for healthy behavioral engagements is lacking (Chin, Walters, Cook, & Huang, 2007). Consistent with guidelines set forth by the National Racial and Ethnic Approaches to Community Health Project (REACH) 2010 organized by the CDC to combat health disparities in minority communities (Figure15), results from this study address the initial steps of the evaluation model by providing context, causes, and solutions for health disparities (Giles, Tucker, Brown, Crocker, Jack, Latimer, et al., 2004). Furthermore, the results from this study are consistent with the Healthy People 2010 7-11 Objective to increase the proportion of local health departments that have established culturally appropriate and linguistically competent community health promotion and disease prevention programs (DHHS, 2000).

Figure 15. REACH 2010 Planning Model



This study aimed to shift the current education-based clinical practice paradigm to a more encompassing paradigm that incorporates impactful socioecological factors related to the health of parents and their children. Though education-based programs have been implemented in a public health setting effectively, it has been found that targeting specific segments of a population and tailoring messages for the individual can make health promotion programs more relevant to a given community (Krueter, 1999). Although there is a trend to include more advanced and effective communication technologies to deliver the messages of public health agencies (Jackson, et al., 1998; Science Panel on Interactive Communication and Health, 1999; Harris, 1995), these programs will have limited impact in underserved populations that lack access to such communication channels. Research demonstrates that even after targeted health communication interventions occur, low income and low educated groups still remain less likely to change their behaviors than their counterparts (Freimuth, 1990). Effective education interventions tailored to a given population have been shown to change health beliefs (Avci & Gozum, 2009; Avci & Kurt, 2008; Gursoy, Yilmaz, Nural, Kahriman, Yigitbas, Balut, et al. 2009). Results of the present study aim to challenge these practices by implicating the need to target personal and parental health beliefs of low-income families that would change the behaviors of the children; potentially reducing the impact of health disparities for future generations.

One facet of the study's results focused on the role of mental health stigma and service utilization for parents and their children. Rural mental health utilization rates (Hartley, Agger, & Miller, 2002) and proportion of psychologists (Gamm, 2004) are lower than in urban areas. Persons in rural areas experience lower accessibility to

frequent services and are more likely to receive lower quality services when accessed (Fortney, Rost, Zhang, & Warren, 1999). Taken with the increased focus by federal agencies on rural mental health (National Institutes of Health, 2004), there is an apparent need for effective mental health interventions that are feasible within rural communities.

Overall though, it appears that interventions focusing on urban obese Latinos in regards to emotional precursors of unhealthy eating habits may be the most effective and most highly received. Urban obese Latinos report higher levels of perceived mood disorder likelihood and a higher level of comfortableness with talking to a mental health professional. Whereas among rural Latinos, those who are lean report the lowest perceived likelihood of depression, but higher comfortableness seeing a mental health professional for an emotional/mental problem. Therefore, considerations regarding enhancing comfortableness in seeking mental healthcare among rural Latinos should be mindful that obese persons might differ from lean persons.

Such methods can be approached from the socioecological model (see Figure 2). Though there may be a lack behavioral health services in rural areas, other social services organizations exist (i.e. primary care settings, schools, churches) (Sears, Evans, & Kuper, 2003). Behavioral health services within a primary care setting and telehealth technology utilization present as means for families to receive mental health services (US Department of Health and Human Services, 2008). From a community-level standpoint, rural children and adolescents are more likely to receive mental health services through the schools instead of specialty behavioral health centers (Burns et al 1995). Based on these results, most participants rated their likelihood of seeking mental health services if experiencing a serious mental/emotional problem as being more likely than not.

Furthermore, rural parents reported less perceived embarrassment regarding their children receiving mental health services. Taken together, effective means of increasing awareness for mental/behavioral health and facilitating efficacious interventions may be beneficial to occur in rural areas during school events (i.e. parent teacher conferences) or within healthcare settings (i.e. WIC appointments, child immunization clinics). Rural hospitals are capable and even exceed the urban hospital's ability to address community health needs (Zhang, Mueller, & Chen, 2009), showing that community specific interventions within a rural healthcare setting present as being feasible.

These results signify that stress can deter adherence to a medication regimen and adherence to doctor's advice among urban, Latino, and non-insured populations. Given that urban Latinos who are non-insured represent a distinct sub-group, interventions focusing on the impact of stress and medical adherence appear to be needed. Prior evidence has demonstrated that stress-reduction interventions result in health outcomes (see Grossman, Nieman, Schmidt, & Walach, 2004). Stress reduction interventions have been developed primarily for middle-class White populations. However, it is unknown the efficacy of these interventions when working with diverse low-income patients. Researchers have proposed a stress-reduction intervention for pregnant Latina women (Cohen, 2003) that utilized images of being with their family and within a supportive group environment as opposed to being "away in nature" as with prior interventions. Scripts were recorded by a native Spanish speaker and music was included. Prior interventions encouraged participants to practice the relaxation methods in a quite room sans distractions. Cohen (2003) postulated that within a low-income population, where in many cases, a house is shared with multiple families; such a direction was not practical or

necessary. Therefore, the intervention was tailored so that relaxation methods were practiced within daily life (i.e. washing dishes, doing laundry, waiting in line, riding a bus). Preliminary results of the tailored intervention indicate success in decreasing levels of stress (Cohen, 2003).

The study uses a novel application of the HBM by comprehensively assessing parental health beliefs as opposed to the traditionally assessment of personal health beliefs. The model utilized in this study is novel in that it applied the HBM to broad range of health beliefs of parents and provides insight into potential mechanisms of health belief transmission to the health of their children. Additionally, it has yet to be demonstrated how perceptions of healthcare reform and healthcare stigmatization would potentially affect the nature of the HBM.

With the results of this study, healthcare providers that serve a low-income population can benefit. Intervention framing can be modified to reflect the beliefs of the population. Prior studies have evaluated the effects of changing health beliefs and resolving the discrepancies between these beliefs and the lack of positive health behaviors (i.e. Disconnected Values Model Intervention), indicating that changing beliefs is a plausible mechanism of health behavior change (Anshel & Kang, 2007). Focusing one's beliefs (i.e. values) and their relation to healthy behavior engagement (i.e. exercise) can reduce participants' perceived barriers to the healthy behavior (Brinthaupt, Kang, & Anshel, 2010). Taken together, further research is needed to examine the effects of a health-belief focused intervention that is socioecologically tailored.

Because many of the current intervention strategies are educationally based, modifications to the content and delivery of the materials can be made to increase

utilization and adherence to healthcare. For example, the results could identify variables that prevent health education materials from becoming behaviors as well as identify variables that are most rewarding to participants. After these identifications are made, informed clinical decisions will be planned in conjunction with both the researcher and the practitioners.

This study possesses several indirect positive gains to the field of Public Health and Clinical Psychology. First, the study will fill a wide gap in literature that examines the role of health beliefs among a low-socioeconomic population, as well the effects that these hold on the health of their children. The results will allow for tailored intervention and prevention efforts that would produce more efficacious results due to the specificity of their formulation.

Chapter 6: References

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Appendices

Appendix A

Informed Consent (English)

University of Nebraska
DEPARTMENT OF PSYCHOLOGY

Informed Consent Form

Assessing the Health Beliefs, Practices, and Psychological Components of Patients

Purpose of Project

Researchers at the University of Nebraska-Lincoln would like to invite you to participate in a research study. The purpose of the research study is to examine how your beliefs and behaviors related to your heath are related to your emotions, stress levels, and discrimination you have experienced. We also wish to study various health care attitudes and barriers that affect the community. If you are interested in participating, you must be 19 years of age or older and able to complete questionnaires to be eligible for participation.

Procedures

We are asking you to complete a packet of questionnaires. It will take approximately 20-45 minutes to complete, will be completed in this waiting room, and returned prior to leaving. The questions ask questions about your background (e.g., sex, marital status, race, education), immigration history and language preference. We also will ask questions about your thoughts about health care, barriers to adequate health care, health-related practices (e.g., cigarette smoking) and health conditions (e.g., hypertension, diabetes). These questions will be about both you and your children. We will ask questions about your stress and general mood.

If you agree to participate in this study, your name will not be connected to your responses and all responses will be kept confidential. Your staff and doctors of your care provider will not have access to this information. All information will be coded in numbers and examined for research in group format. No individual case will be examined by itself.

Risks and/or Discomforts

There are no known risks associated with participating in this research project. In addition, if you wish to withdraw your consent to participate, you may do so at any time without harming your relationship with the researchers, the university, or your healthcare provider. Further, your treatment will not be affected in any way should you choose not to allow your responses to be used for research purposes.

Benefits

Although there are no known direct benefits to study participants, this project may provide researchers and clinicians with a better understanding of factors that influence physical health and health care for your community. .

Compensation

For participating, each participant is entered into a random drawing to receive $10 given at this location. Chances of winning are 3 in 25.

Confidentiality

There will be no identifying information (e.g., names, social security numbers) obtained during this study. We will never look at responses to answers by themselves. When examining information, we analyze all information together with all other participants. After returning your survey to the research assistant, the questionnaires will be immediately transported to the university and stored in a locked room, in a locked file cabinet. Access to files is restricted to research staff involved in the study. Once coded and entered into a computer for examination, the data will be stored in password protected databases in the principal investigator's office and will be kept for 10 years after the study is complete. Only the researchers listed at the bottom of this form and study personnel will have access to your data. The knowledge gained from this study may be published in scientific journals or presented at scientific meetings, but it will be reported only as aggregate data.

Opportunity to Ask Questions

You may ask questions about this research and have those questions answered before agreeing to participate in the study. In addition, you may ask questions during the study. You may also call the investigator at any time. If you have questions concerning your rights as a research participant that have not been answered by the investigator or if you wish to report concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965.

Freedom to Withdraw

You are free to decide not to participate in this study or to withdraw your consent to participate at any time without harming your relationship with the investigator, the University of Nebraska, or your healthcare provider. Your decision will not result in any loss or benefits to which you are otherwise entitled.

Consent to Participate

You are voluntarily making a decision whether or not to participate in this research study. By you completing the survey, you are providing consent to participate. You should keep this informed consent form for your records.

Name and Phone Number of Investigator(s)

Krista Highland and Dennis McChargue, Ph.D. (402) 472-3197

Appendix B

Informed Consent (Spanish)

University of Nebraska
DEPARTMENT OF PSYCHOLOGY

Forma de Aceptación de Participación

Evaluación de las creencias en materia de salud, prácticas médicas y factores psicológicos de los pacientes

Propósito de este Estudio

Como investigadores de la Universidad de Nebraska-Lincoln quisieramos invitarle a participar en este estudio. El propósito del mismo es examinar cómo sus ideas y comportamientos en materia del cuidado de la salud se reflejan en sus emociones, niveles de estrés y las posibles formas de discriminación que usted haya experimentado. También deseamos estudiar varias actitudes sobre el cuidado de la salud y los obstáculos sobre el cuidado de la salud que afectan a la comunidad. Si está usted interesada(o) en participar, debe tener por lo menos 19 años de edad y poder completar el Cuestionario de este estudio para poder participar.

Procedimiento

Le vamos a pedir que completa un paquete de cuestionarios. El cuestionario toma aproximadamente 20-45 minutos, será completado en esta sala de espera, y será vuelto antes de que usted vaya. Las preguntas abordan sus antecedentes de salud (por ejemplo: sexo, estado civil, raza, educación), historia de inmigración y preferencia de lenguaje. También le preguntaremos sobre sus ideas sobre el cuidado de la salud, obstáculos para un adecuado cuidado de la salud, prácticas relacionadas con la salud (por ejemplo: el hábito de fumar cigarrillos) y condiciones médicas (por ejemplo: hipertensión, diabetes). Estas preguntas serán sobre usted y sobre sus hijos. Igualmente haremos preguntas sobre su estrés y estado de ánimo.

Si usted acepta participar en este estudio, su nombre NO quedará conectado con sus respuestas y sus respuestas permanecerán confidenciales. El personal médico y los doctores que atienden su salud, no tendrán acceso a esta información. Toda la información será codificada en números y examinada grupalmente junta con las respuestas de otros participantes. Ningún caso individual será examinado por separado.

Riesos

No existe ningún riesgo asociado con su participación en este proyecto de estudio. Adicionalmente, si usted desea retirar su consentimiento para participar en este proyecto, usted puede hacerlo en cualquier momento sin perjudicar su relación ni con las personas que conducen este estudio, ni con la Universidad, ni con sus proveedores de servicios de salud. Tampoco su tratamiento médico se verá afectado de ningua manera si usted escoge no permitir que sus respuestas sean usadas para los fines de este estudio.

Beneficios

Aunque no existen beneficios directos para los participantes de este estudio, este proyecto podría proveer una mejor comprensión de los factores que influyen la salud física y los cuidados de la salud en su comunidad a los investigadores y el personal clínico.

Compensación

Si usted decide participar en esta encuesta, será incluido(a) en un sorteo. Se seleccionarán al azar doce ganadores(as) para recibir un premio en efectivo de $10. por cada ganador en esta ubicación. Tres en cada veinticinco personas ganarán.

Confidencialidad

Durante este estudio, no se obtendrá ninguna información que permita identificar a los participantes (por ejemplo: nombre o número de seguro social). Los invesigadores de este estudio nunca veremos las respuestas por sí mismas. Cuando examinemos la información, analizaremos juntas todas las respuestas de todos los participantes. Después de que usted devuelva la encuesta a la persona que le hizo este estudio, los cuestionarios serán inmediatamente transportados a la Universidad y almacenados en un gabinete bajo llave contenido en un salón asegurado. El acceso a estos archivos será exlusivamente permitido al equipo de investigadores de este estudio. Una vez que las respuestas sean codificadas y capturadas en una computadora para su estudio, los datos serán almacenados en una base de datos bajo clave de acceso en la oficina del investigador principal y conservadas durante diez años luego de que el estudio sea completado. Sólo los investigadores que aparecen al final de esta planilla y el personal del estudio tendrán acceso a estos datos. El conocimiento adquirido por este estudio será publicado en revistas científicas o presentada en conferencias científicas, pero solamente serán reportadas como estadísticas y datos generales.

Oportunidad para hacer preguntas

Usted podrá hacer preguntas sobre este estudio y obtener respuestas a esas preguntas antes de aceptar a participar. Adicionalmente, usted podrá hacer preguntas durante el estudio. Usted podrá llamar a los investigadores en cualquier momento. Si usted tiene preguntas sobre sus derechos como participante de este estudio que no hayan sido respondidas por el investigador o si usted desea reportar dudas sobre el mismo, usted puede contactar el Comité de Revisión Institucional (Institutional Review Board) de la Universidad de Nebraska en Lincoln al teléfono (402) 472-6965.

Libertad para retirarse de este estudio

Usted es libre de decidir NO participar o retirar su consentimiento para participar en este estudio en cualquier momento, sin dañar su relación con el investigador, con la Universidad de Nebraska o con su proveedor de salud. Su decisión no provocará ninguna pérdida o adquisición de los beneficios a los que usted tiene derecho.

Aceptación de Participación

Usted esta voluntariamente tomando la decisión de participar o no en este estudio. En llenando esta encuesta, usted está proporcionando a consentimiento para participar. Usted debe guardar esta Forma de Aceptación de Participación para sus expedientes.

Nombres y número telefónico del (de los) investigador (es)

Krista Highland, M.A. and Dennis McChargue, Ph.D. (402) 472-3197

238 Burnett Hall/ P.O. Box 880308/ Lincoln, NE 68588-0308/ (402) 472-3197/ Fax (402) 472-4637

Appendix C

Questionnaire (English)

Health Questionnaire

Today's Date: __ __ / __ __ / __ __ __ __
M M D D Y Y Y Y

General

We are going to ask you some general questions about yourself. Some questions will require you to check one or multiple boxes, while other questions will require you to fill in your answer. Please read the instructions following each question.

1. Why did you come here today? *Check all that apply.*

☐Medication ☐ General Complaints (for example, feeling as though you have the flu, or sustained an injury)
☐Referral ☐ Other (please specify) _____
☐Routine Check-Up
☐Follow-Up Maintenance

2. How serious would you rate the problem you came here for today? *Check one.*

☐ Very Serious ☐ Serious ☐ Somewhat Serious ☐ Not that serious

3. What is your date of birth? __ __ / __ __ / __ __ __ __
M M D D Y Y Y Y

4. What is your sex? *Check one.*

☐Male ☐Female ☐Other

5. Are you currently …. *Check one.*

☐ Single/Never Married ☐ Married ☐ Living with a Partner
☐ Divorced ☐ Separated ☐ Widowed

6. Are you Latino, Hispanic, or of Spanish origin? *Check one.*

☐No
☐ Yes

7. Which of the following describes you? *Check all that apply.*

☐ Caucasian ☐ African American/Black
☐ African ☐ American Indian/Native American/ Alaskan Native
☐ Indian ☐ Asian American/Pacific Islander
☐ Kurdish ☐ Middle Eastern/Arabic (specify) _____
☐ Other (specify) _____

8. What City, State, and Country were you born in?	
9. If born outside of the United states, what is the date of immigration to the United States?	___ ___/ ___ ___ / ___ __ ___ ___
10. What town do you live in? If you do not live in a town, what is the closest town to where you live?	
11. What language do you prefer to communicate in?	

12. In 2014, the government will require all persons to obtain health insurance. How will this effect your use of healthcare? Your use of healthcare, such as checkup appointments and screenings, will…

- ☐ Increase
- ☐ Stay the same
- ☐ Decrease

13. What is the *highest* grade or year of school you have completed? ***Check all that apply.***

- ☐ Eighth grade or less
- ☐ Some high school
- ☐ High school graduate or GED certificate
- ☐ Some technical school or college
- ☐ Technical school graduate
- ☐ College Graduate (A.A., B.A., B.S.)
- ☐ Postgraduate or professional degree (M.A., M.S., Ph. D.)

14. In regards to your employment, are you currently….. ***Check one.***

- ☐ Employed for wages or self-employed
- ☐ Out of work for more than a year
- ☐ Out of work for less than a year
- ☐ A homemaker and/or supported by a partner or family member(s)
- ☐ A student
- ☐ Retired
- ☐ Unable to work

15. Which of the following categories best describes your average annual household income from all sources, before taxes? ***Check one.***	
	☐ Less than $10,000
	☐ $10,000 - $14,999
	☐ $15,000 - $19,999
	☐ $20,000 - $24,999
	☐ $25,000 - $29,999
	☐ $30,000 - $34,999
	☐ Over $35,000
	☐ Don't know/not sure

16. Please list the ages of your children	
17. How many people do you currently live with (not counting yourself)?	___ people

18. About how much do you currently weigh without shoes? _____ pounds

19. What is your height without shoes on? _____ feet and _____ inches

20. Do you currently have access to the internet? ***Check all that apply.***

- ☐ No
- ☐ Yes, at home
- ☐ Yes, at work
- ☐ Yes, elsewhere

21. How often do you use the internet?

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Never

Stress

Now we are going to ask you some questions about stress in your life. The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by checking the column that matches how often you felt or thought a certain way.

Question	Never	Almost Never	Some-times	Fairly Often	Very Often
22. In the last month, how often have you been upset because of something that happened unexpectedly?					
23. In the last month, how often have you felt that you were unable to control the important things in your life?					
24. In the last month, how often have you felt nervous and "stressed"?					
25. In the last month, how often have you felt confident about your ability to handle your personal problems?					
26. In the last month, how often have you felt that things were going your way?					
27. In the last month, how often have you found that you could not cope with all the things that you had to do?					
28. In the last month, how often have you been able to control irritations in your life?					
29. In the last month, how often have you felt that you were on top of things?					
30. In the last month, how often have you been angered because of things that were outside of your control?					
31. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?					

Health Care/Health Care Accessibility Now we are going to ask you some questions about various health behaviors. For some questions, please mark your response(s) by checking the box that best matches your answer.	
Question	**Response**
32. Have you experienced any of the following problems in getting quality health care in your community during the past year? (check all that apply)	☐ It costs too much/ can't afford it
	☐ Don't trust or like doctors
	☐ The provider does not speak your language
	☐ Have been treated differently because of your race/ethnicity
	☐ Don't know where to go for help with your problem
	☐ Don't have transportation
	☐ The clinic' office hours are not convenient
	☐ Have to wait too long to be seen at the doctor's office
	☐ The provider does not understand/accept my cultural practices/beliefs
	☐ It takes too long to get an appointment
33. Which resources do you typically use first when you feeling ill? *Check one.*	☐ Medical Doctor
	☐ Hospital emergency room
	☐ Nurse/Nurse Practitioner
	☐ Folk Healer/Curandero/Medicine Man
	☐ Psychic/Spiritualist
	☐ Family/Friend/Neighbor
	☐Counselor
	☐ Church or Temple Priest or Rabbi
	☐ Community Center
	☐ Other (specify) _____
34. What type of health insurance do *you* currently have?	☐ None, and have not had any for over 12 months
	☐ None, but have previously had insurance in the past 12 months
	☐ Medicaid
	☐ Medicare
	☐ Other (specify)_____
35. What type of insurance do *your children* currently have?	☐ None, and have not had any for over 12 months
	☐ None, but have previously had insurance in the past 12 months
	☐ Medicaid
	☐ Medicare
	☐ Other (specify)_____
36. On average, how long does it take you to travel from the place you live to the doctor you are seeing? _____ minutes	
37. How did you get here today? *Check one.* ☐ Walked ☐ Drove myself ☐ Friend/Family member drove me ☐ Bus or public transportation	

Health Care Perceptions

People differ a lot in their feelings about the medical care they receive. On the following questions, please 'check' the box that best describes your feelings.

Question	Response			
	Yes, all the time	Most of the time	Some of the time	No, never
38. Would you say the doctors you have seen in the past 5 years have treated you with a great deal of respect?				
39. Would you say the doctors spent as much time with you as you wanted?				
40. Did the doctors involve you in decisions about your care as much as you wanted?				
41. Do you follow the doctors' advice, or treatment plan?				
42. When you are prescribed medication, do you take the medication as instructed by your doctors?				
43. Overall, are you satisfied with the quality of health care you have received?				

People differ a lot in their opinions about seeking professional help for emotional problems. On a scale from 1 to 5, please check the appropriate column. (5 being the highest and 1 being the lowest)

Question	Response				
	1 Low	2	3	4	5 High
44. How likely are you to see a professional if you had a serious emotional problem?					
45. How comfortable would you feel about talking about personal problems with a professional like a psychologist or psychiatrist?					
46. How embarrassed would you be if your friends knew you were getting professional help for an emotional problem?					
47. How comfortable would you feel about your children talking about personal problems with a professional like a psychologist or psychiatrist?					
48. How embarrassed would you be if your friends knew your children were getting professional help for an emotional problem?					

49. The following list of responses is some possible opinions adults have about eating healthy foods and exercise. Do you believe that the following statements are true for you, children, and primary caregiver in your family that take care of your children? If the statement is true, place a check in the appropriate column on the right-hand side. If you are the sole primary adult in your family, please ignore the far-right column.

	Check (✓)		
Opinions	True for Me	True for Children	True for Other Primary Family Caregiver
Healthy foods are too expensive to afford.			
Unhealthy eating habits are hard to change.			
Most healthy foods taste bad.			
Do not have access to shops with healthy foods			
Do not know which foods are healthy			
Do not have enough time to make healthy foods.			
Forget about eating healthy.			
Healthy foods result in feeling physically better			
Eating healthy foods results in less fatigue and tiredness			
Eating healthy increases self-confidence			
Eating healthy results in being a good role model			
Eating healthy lessens the probability of having future health problems			
Exercise helps with weight management			
Exercise lowers risk of illnesses			
Exercise reduces feelings of depression, anxiety, or stress			
Exercise is a fun activity to do with friends			
Exercise creates bad feelings about self			
Exercise takes time away that could be spent with family/friends			
Exercise is too tiring			
Exercise improves self-esteem and feelings of well-being			
There is no time for exercise.			
Exercise is boring			
Exercise is something that has been tried in past, but failed.			
Exercising is not supported by friends and/or family			

Medical History

Now we are going to ask you some questions about your medical history. Please mark your response in the appropriate column with a check (✓).

50. How likely are *you* to develop the following diseases?

	Not likely at all	Somewhat likely	Likely	Very Likely	My doctor has told me I have this disease
High Blood Pressure					
Heart attack, or any other heart disease					
Cancer					
Stroke					
Diabetes or sugar diabetes					
Anxiety					
Depression					
Obesity					
Breathing problems, such as asthma					
COPD					

51. How serious a condition do *you* believe the following conditions to be to have?

	Not serious	Somewhat serious	Serious	More serious	Very serious
High Blood Pressure					
Heart attack, or any other heart disease					
Cancer					
Stroke					
Diabetes or sugar diabetes					
Anxiety					
Depression					
Obesity					

Children's Medical History

Now we are going to ask you some questions about the medical history of your child(ren). Please mark your response in the appropriate column with a check (✓)

52. How likely do you believe any of your children are to develop the following diseases?

	Not likely at all	Somewhat likely	Likely	Very Likely	My doctor has told me my child has this disease
High Blood Pressure					
Heart attack, or any other heart disease					
Cancer					
Stroke					
Diabetes or sugar diabetes					
Anxiety					
Depression					
Obesity					
Breathing problems, such as asthma					
COPD					

53. How serious a condition do you believe the following conditions to be for any of your children to have?

	Not serious	Somewhat serious	Serious	More serious	Very serious
High Blood Pressure					
Heart attack, or any other heart disease					
Cancer					
Stroke					
Diabetes or sugar diabetes					
Anxiety					
Depression					
Obesity					

General Health Questions

Now we are going to ask you some questions about the general health of you and your child(ren).

54. Who makes the majority of the health decisions in your household? *Check one.*
- ☐ Me
- ☐ My partner or spouse
- ☐ Another family member
- ☐ Other

55. How many soda pops do you drink in a week?

_____ sodas

56. How many soda pops do your children drink in a week?

_____ sodas

57. How many days a week do you eat fried food?

_____ days

58. How many days a week do your children eat fried food?

_____ days

59. How many days a week do you engage in exercise for 20 minutes or more?

_____ days

60. How many days a week do your children engage in exercise for 20 minutes or more?

_____ days

61. Over the last 12 months, how many times did you see the following medical professionals?
- Primary care clinic: ____times
- Urgent Care Clinic: ____ times
- Emergency Room: ____ times
- Specialist : ____ times

Mood

Now we are going to ask you some questions about your mood. For each question, please check one box.

62. During the past month, have you been down or depressed most of the day nearly every day for 2 weeks straight or more?
- ☐ No
- ☐ Yes

63. Over the course of your life, have you ever been down or depressed most of the day nearly every day for 2 weeks straight or more?

☐ No ☐ Yes

Smoking Now we are going to ask you some questions about smoking cigarettes. For some questions, please mark your response(s) in the right hand column labeled "Check".
64. Have you smoked at least 100 cigarettes in your entire life? (note: 100 cigarettes = 5 packs) ☐ No ☐ Yes
65. How many cigarettes do you smoke a day? _____ cigarettes
66. How soon after you wake do you have your first cigarette? ☐ Within 5 minutes of waking up ☐ Within 6-30 minutes of waking up ☐ 31-60 minutes after I wake up ☐ After 60 minutes of waking up

You have now completed the survey. Please return the survey to the administrator. Thank you greatly for your participation!

Appendix D

Questionnaire (Spanish)

Cuestionarios De La Salud

University of Nebraska Lincoln

Pioneering new frontiers.

La fecha de hoy (mm/dd/aaaa) : __ __ / __ __ / __ __ __ __

Información General

Vamos a hacerle algunas preguntas generales sobre su persona. Algunas preguntas requieren que usted marque una o más de una de las opciones, mientras que otras requieren que usted escriba su propia respuesta. Por favor, lea las instrucciones para cada pregunta.

1. ¿Por qué acudió usted hoy a esta institución de atención a la salud? *Marque todas las que correspondan con su situación.*

☐ Para obtener un medicamento
☐ Fue referido a esta institución
☐ Por una revisión de rutina
☐ Para un seguimiento de su tratamiento
☐ Padecimientos generales (por ejemplo, siente como si estuviera resfriado o se ha lastimado)
☐ Otro (especifique) _____

2. ¿Qué tan grave describiría usted el problema que lo trajo aquí hoy? *Marque sólo uno.*

☐ Muy Grave ☐ Grave ☐ Más o Menos Grave ☐ No Tan Grave

3. ¿Cuál es su fecha de nacimiento? __ __ / __ __ / __ __ __ __
M M D D A A A A

4. ¿A qué sexo pertenece? *Marque sólo uno.*

☐Masculino ☐Femenino ☐Otro

5. Su estado civil actual es actualmente… *Marque uno.*

☐ Soltera (o)/Nunca Casada (o) ☐ Casada (o) ☐ Viviendo en pareja
☐ Divorciada (o) ☐ Separada (o) ☐ Viuda (o)

6. ¿Es usted Latino, Hispano o de origen español? *Marque uno.*

☐No
☐ Si

7. ¿Cuál de las siguientes categorías le describen a usted? *Marque todas las que correspondan.*

☐ Caucásico ☐ Afro-Americano/Negro
☐ Africano ☐ Indio Americano/Nativo Americano/ Nativo de Alaska
☐ Hindú ☐ Asiático-Americano /De las Islas del Pacífico
☐ Kurdistán ☐ Del Medio Este/De origen Arable (especifique) _____
☐ Otro (especifique) _____

8. ¿En qué Ciudad, Estado y País nació usted?	
9. Si usted nació fuera de los Estados Unidos ¿en qué fecha inmigró a los Estados Unidos?	___ ___/ ___ ___ / ___ __ ___ ___ *M M D D A A A A*
10. ¿Qué ciudad usted vive adentro? ¿Si usted no vive en una ciudad, cuál es la ciudad más cercana a donde usted vive?	
11. ¿En que idioma prefiere comunicarse?	

12. En 2014, el gobierno requerirá a todas las personas obtener seguro médico. ¿Cómo esto efectuará su uso de la atención sanitaria? Su uso de la atención sanitaria, tal como citas del chequeo e investigaciones
- ☐ Aumentará
- ☐ Permanecerá iguales
- ☐ Disminuirá

13. ¿Cuál es el grado escolar *más alto* que usted ha completado? ***Marque uno.***
- ☐ Secundaria o menos
- ☐ Bachillerato
- ☐ Escuela técnica profesional
- ☐ Postgrado (M.A., M.S., Ph. D.)
- ☐ Bachillerato incompleto
- ☐ Escuela técnica incompleta o universidad incompleta
- ☐ Universidad (A.A., B.A., B.S.)

14 .En relación a su empleo, usted se encuentra actualmente… ***Marque uno.***
- ☐ Empleado asalariado o autónomo
- ☐ Sin empleo desde hace más de un año
- ☐ Sin empleo desde hace menos de un año
- ☐ Ama de casa y/o la mantiene otra persona por ejemplo una parejo (a) o miembro (a) de la familia
- ☐ Como estudiante
- ☐ Jubilado
- ☐ Discapacitado para trabajar

15. ¿Cuál de las siguientes categorías describen mejor el total de su ingreso familiar anual promedio antes de pagar impuestos? ***Marque uno.***	
	☐ Menos de $10,000
	☐ Entre $10,000 - $14,999
	☐ Entre $15,000 - $19,999
	☐ Entre $20,000 - $24,999
	☐ Entre $25,000 - $29,999
	☐ Entre $30,000 - $34,999
	☐ Más de $35,000
	☐ No sabe/no está segura(o)

16. Por favor, escriba los edades de sus hijos.	
17. ¿Con cuantas personas vive usted actualmente (sin contarse usted)?	_____ personas

18. ¿Cuanto pesa usted más o menos sin zapatos? _____ libras

19. ¿Cuál es su estatura aproximada sin zapatos? _____ pies y _____ pulgadas

20. Usted tiene acceso al internet? ***Marque todas las que correspondan.***
- ☐ No
- ☐ Si, en mi casa
- ☐ Si, en mi trabajo
- ☐ Si, a otra parte

21. ¿Cuantas veces usted utiliza el Internet?
- ☐ Cada día
- ☐ Semanal
- ☐ Mensual
- ☐ Nunca

Estrés

Ahora vamos a preguntarle algunas cosas sobre el estrés en su vida. Las preguntas en esta escala se refieren a sus sensaciones y pensamientos durante el último mes. En cada caso, marque la columna que describa la frecuencia con la que usted ha sentido o pensado de cierta manera.

Pregunta	Nunca	Casi Nunca	Algunas veces	Frecuen-temente	Muy Frecuen-temente
22. En el último mes, ¿que tan frecuentemente se ha usted sentido enojado por algo que sucedió inesperadamente?					
23. En el último mes, ¿qué tan frecuentemente se ha sentido usted incapaz para controlar las cosas importantes en su vida?					
24. En el último mes, ¿qué tan frecuentemente se ha sentido usted nerviosa (o) o "estresada (o)"?					
25. En el último mes, ¿qué tan frecuentemente se ha usted sentido confiado en su capacidad para afrontar sus problemas personales?					
26. En el último mes, ¿qué tan frecuentemente ha usted sentido que las cosas suceden conforme a sus planes?					
27. En el último mes, ¿qué tan frecuentemente ha usted pensando que no puede cubrir todas las cosas pendientes que tiene que hacer?					
28. En el último mes, ¿qué tan frecuentemente ha sido usted capaz de controlar la irritación en su vida?					
29. En el último mes, ¿qué tan frecuentemente ha sentido que tiene las cosas bajo control?					
30. En el último mes, ¿qué tan frecuentemente se ha sentido usted enojado por cosas fuera de su control?					
31. En el último mes, ¿qué tan frecuentemente ha sentido usted que las dificultades se acumulaban tanto que usted no podía resolverlas?					

Cuidado de la Salud/Acceso a Cuidados de la Salud Ahora vamos a hacerle algunas preguntas sobre diversos comportamientos de salud. Para algunas preguntas, por favor maque su(s) respuesta(s) en la comuna de la derecha.	
Pregunta	**Respuesta**
32. ¿Ha usted experimentado cualquiera de los siguientes problemas para obtener servicios de salud de calidad en su comunidad en el año reciente? (marque todas las que correspondan)	☐ Costaba demasiado/ no podía pagarlo
	☐ No confiaba o no le gustaban los doctores
	☐ El personal no hablaba su idioma
	☐ Fue tratado diferente debido a su raza o grupo étnico
	☐ No sabía a donde acudir para recibir ayuda en su problema
	☐ No tenía medio de transporte
	☐ Las horas de atención no le resultaban convenientes
	☐ Tenía que esperar demasiado para ver al doctor
	☐ La institución de salud no entendió o aceptó mis creencias o prácticas culturales
	☐ Tomaba demasiado obtener una cita
33. ¿A qué recurre usted primero usualmente cuando no se siente bien? *Marque uno.*	☐ Medico o Doctor
	☐ Sala de emergencias de un Hospital
	☐ Enfermera /Enfermera especializada
	☐ Curandero
	☐ Psíquico/Espiritista
	☐ Familia/Amigos/Vecinos
	☐ Consejero
	☐ Iglesia o Templo/ Sacerdote, Pastor, Rabino
	☐ Centro Comunitario
	☐ Otros (especifique) _____
34. ¿Qué tipo de seguro médico tiene usted actualmente?	☐ No tiene seguro, y no he tenido seguro para 12 meses o más
	☐ No tiene seguro, pero he tenido seguro en los últimos 12 meses
	☐ Medicaid
	☐ Medicare
	☐ Otros (especifique)_____
35. ¿Qué tipo de seguro médico sus niños tienen ellos actualmente ?	☐ No tiene seguro, y no han tenido seguro para 12 meses o más
	☐ No tiene seguro, pero han tenido seguro en los últimos 12 meses
	☐ Medicaid
	☐ Medicare
	☐ Otros (especifique)_____
36. En promedio, ¿cuánto tiempo le toma en viajar del lugar donde usted vive a donde esta el doctor que le atiende? _____ minutos	
37. ¿Qué medio de transporte usó usted para llegar aquí hoy? *Marque uno.* ☐ A pie ☐ Usted condujo su auto ☐ Un Familiar o amigo la (o) trajo en auto ☐ Autobus o transporte público	

Percepción del los servicios de Cuidado de la Salud

La gente tiene opiniones muy diferentes sobre los servicios de salud que recibe. En las siguientes preguntas, por favor, marque la casilla correspondiente a la respuesta que describa mejor sus opiniones.

Preguntas	Respuestas			
	Si, todo el tiempo	La mayor parte del tiempo	Algunas veces	No, nunca
38. ¿Diría usted que los doctores que la/lo han visto a usted en los pasados 5 años lo han tratado con mucho respeto?				
39. ¿Diría usted que los doctores que la/lo han visto han dedicado en usted todo el tiempo que usted requería?				
40. Los doctores le permitieron decidir sobre su tratamiento tanto como usted deseaba?				
41. ¿Siguió usted las recomendaciones del doctor o el tratamiento que le prescribió?				
42. ¿Cuando recibe una prescripción sigue el tratamiento tal como se lo indicó el doctor?				
43. En general, ¿está usted satisfecha (o) con la calidad del tratamiento que ha recibido?				

Las personas difieren mucho en sus opiniones sobre buscar ayuda profesional en problemas emocionales. En una escala de 1 a 5, por favor, marque la columna apropiada. (5 es lo más alto y 1 lo más bajo)

Pregunta	Respuesta				
	1 Bajo	2	3	4	5 Alto
44. ¿Qué tan posible es que usted vea a un profesional si tiene usted un serio problema emocional?					
45. ¿Qué tan cómoda (o) se siente usted a cerca de hablar de problemas personales con un profesional?					
46. ¿Qué tan avergonzada (o) se sentiría usted si sus amigas/os se enteraran de que usted está recibiendo ayuda profesional por problemas emocionales?					
47. ¿Qué tan cómoda (o) se sentiría usted sobre que sus hijos hablen sobre problemas personales con un profesional?					
48. ¿Qué tan avergonzada (o) se sentiría usted si sus amigos supieran que sus hijos están recibiendo ayuda profesional por problemas emocionales?					

49. La siguiente lista de respuestas son algunas posibles ideas que adultos tienen respecto a comer comidas saludables el ejercicio. ¿Cree usted que las siguientes afirmaciones son ciertas o falsas para usted/su hijo/otra persona adulta responsable viviendo en su casa quien cuida para los niños. Si la afirmación es cierta para usted o su hijo, por favor, marque la columna correspondiente a la derecha. Si usted es la única persona adulta responsible en su familia, por favor, ignore la columna de la derecha.

	Marque (✓)		
Ideas	**Cierto para Mi**	**Cierto para hijos**	**Otra persona resp.**
La comida saludable es demasiado cara.			
Los hábitos no saludables de alimentación son difíciles de cambiar.			
La mayoría de la comida saludable sabe mal.			
No hay acceso a tiendas que vendan comida saludable.			
No sabe cuáles comidas son saludables.			
No tiene tiempo suficiente para preparar comida saludable.			
Se le olvida comer saludablemente.			
Comer saludablemente provoca que se sienta físicamente mejor.			
La comida saludable provoca que sienta menos fatiga y cansancio.			
Comer saludablemente incrementa la auto-confianza.			
Comer saludablemente provoca ser un buen ejemplo a imitar.			
Comer saludablemente disminuye la probabilidad de tener problemas de salud en el futuro.			
El ejercicio ayuda a controlar el peso			
El ejercicio disminuye el riesgo de enfermedades			
El ejercicio reduce los sentimientos de depresión, ansiedad, o estrés			
El ejercicio es una actividad divertida para hacer con amigos			
El ejercicio crea malas sensaciones sobre uno mismo			
El ejercicio roba tiempo que podría dedicarse a familia y amigos			
El ejercicio provoca fatiga			
El ejercicio mejora la auto-estima y sensación de bienestar			
No tiene tiempo para hacer ejercicio			
El ejercicio es aburrido			
Ha intentado hacer ejercicio en el pasado, pero ha fracasado			
Familia y amigos no apoyan para hacer ejercicio			

Historia Médica

Ahora vamos a hacerle algunas preguntas sobre su historia médica. Por favor, señale la respuesta apropiada en la columna con una marca (✓).

50. ¿Qué tan probable es que *Usted* desarrolle las siguientes enfermedades?

	Muy improbable	**Más o menos probable**	**Probable**	**Muy probable**	**Mi doctor me ha dicho que tengo esta enfermedad**
Alta presión sanguinea					
Ataque al corazón, u otro mal cardiaco					
Cáncer					
Embolia					
Diabetes o azúcar en la sangre					
Ansiedad					
Depresión					
Obesidad					
Problemas respiratorios como Asma					
EOPC: Enfermedad de Obstrucción Pulmonar Crónica					

51. ¿Qué tan serias cree *usted* que sean los siguientes padecimientos par alguien que los sufre?

	No serios	**Más o menos serios**	**Serios**	**Más serios**	**Muy serios**
Alta presión arterial					
Ataque al corazón u otro mal cardiaco					
Cáncer					
Embolia					
Diabetes o azúcar en la sangre					
Ansiedad					
Depresión					
Obesidad					

Historia Médica de sus hijos

Ahora vamos a hacerle algunas preguntas sobre la historia médica de sus hijos. Por favor, señale la respuesta apropiada en la columna con una marca (✓)

52. ¿Qué tan posible cree usted que es que sus hijos desarrollen las siguientes enfermedades?

	Muy improbable	**Más o menos probable**	**Probable**	**Muy probable**	**Mi doctor me ha dicho que mi hijo tiene esta enfermedad**
Alta presión arterial					
Ataque al corazón, u otro mal cardiaco					
Cáncer					
Embolia					
Diabetes o azúcar en la sangre					
Ansiedad					
Depresión					
Obesidad					
Problemas respiratorios como Asma					
EOPC: Enfermedad de Obstrucción Pulmonar Crónica					

53. ¿Qué tan serias cree usted que sean los siguientes padecimientos si sus hijos los tuvieran?

	No serios	**Más o menos serios**	**Serios**	**Más serios**	**Muy serios**
Alta presión arterial					
Ataque al corazón, u otro mal cardiaco					
Cáncer					
Embolia					
Diabetes o azúcar en la sangre					
Ansiedad					
Depresión					
Obesidad					

Salud General

Vamos a hacerle algunas preguntas salud generales sobre su persona y sus hijos.

54. ¿Quién hace la mayoría de las decisiones de salud en su hogar? *Marque uno.*

- ☐ Mi
- ☐ Mi pareja (o)/mi esposa (o)
- ☐ Otro miembra (o) de la familia
- ☐ Otro

55. ¿Cómo lo hacen muchos refrescos que toma en una semana?

_____ refrescos

56. ¿Cómo lo hacen muchos refrescos a sus hijos beben en una semana?

_____ refrescos

57. ¿Cuántos días a la semana come alimentos fritos?

_____ días

58. ¿Cuántos días a la semana los niños consumen alimentos fritos?

_____ días

59. ¿Cuántos días a la semana haces ejercicio durante 20 minutos o más?

_____ días

60. ¿Cuántos días a la semana a sus hijos ejercicio durante 20 minutos o más?

_____ días

61. En los últimos 12 meses, ¿cuántas veces tuvo consulta con los siguientes profesionales de la salud?

- Clínica: ____ veces
- Clínica de atención de urgencias: ____ veces
- Sala de emergencias: ____ veces
- Especialista : ____ veces

Estado de ánimo

Ahora vamos a hacerle algunas preguntas sobre su estado de ánimo. Para cada pregunta, por favor, marque sólo una casilla.

62. Durante el mes más reciente, ha estado usted triste o deprimida (o) la mayor parte del día casi todos los días por 2 semanas o más?

- ☐ No
- ☐ Si

63. A lo largo de su vida, alguna vez ha estado triste o deprimida (o) la mayor parte del día casi todos los días por 2 o más semanas?

- ☐ No
- ☐ Si

Fumar

Ahora vamos a hacerle algunas preguntas sobre fumar. Para algunas preguntas, por favor marque su(s) respuesta(s) en la columna a la derecha con una marca.

64. ¿Ha usted fumado por lo menos 100 cigarrillos a lo largo de su vida? (nota: 100 cigarrillos = 5 paquetes)

- ☐ No
- ☐ Si

65. ¿Cuántos cigarrillos fuma usted diariamente? _____ cigarrillos

66. ¿Qué tan pronto, luego de que usted se despierta, fuma su primer cigarrillo del día?

- ☐ En los primeros 5 minutos después de despertar
- ☐ En los primeros 6-30 minutos después de despertar
- ☐ 31-60 minutos después de despertar
- ☐ Después de 60 minutos después de despertar

Usted ha completado todas las preguntas. Por favor regrese este cuestionario a la persona que se lo entregó. ¡Gracias mucho por su participación!

Appendix E

Letters of Support

April 1, 2010

Krista Beth Highland, M.A.
238 Burnett Hall
University of Nebraska – Lincoln
Lincoln, NE 68588-0308

Dear Ms. Highland,

We are pleased that you selected the OneWorld Community Health Center to include in your application for the AHRQ's Grants for Health Services Research Dissertation Program (R36) (PA-09-212), entitled "Parental to Child Health Belief Transmission in Economically Disadvantaged Persons." OneWorld Community Health Center provides culturally respectful quality health care in partnership with the community. Our service area includes the greater Omaha area, with special attention to the underserved.

If funded we commit to being your performance site. We commit to allowing you to distribute and collect your study's questionnaire within our clinic waiting room. We understand that the data collection will be the responsibility of your research staff, and that families will be compensated for their participation. We have discussed the additional requirements our organization has for conducting research at OneWorld, including providing a copy of the approved IRB application. Our commitment to participating will be contingent upon your completion of those additional administrative requirements.

Your project clearly addresses an important aspect of healthcare behaviors in a primary care setting. We highly value the promotion of evidence-based interventions for underserved populations. Your proposed study will give us an opportunity to evaluate and modify any necessary factors to increase treatment utilization and overall health among our patients.

Sincerely,

Kristine McVea, MD, MPH
Chief Medical Officer, OneWorld Community Health Center

Joint Commission
on Accreditation of Healthcare Organizations

United Way
of the Midlands

March 8, 2010

Dear Krista,

We are pleased that you selected the Central District Health Department to include in your application for the AHRQ's Grants for Health Services Research Dissertation Program (R36) (PA-09-212), entitled "Parental to Child Health Belief Transmission in Economically Disadvantaged Persons." The Central District Health Department provides affordable, accessible, and culturally appropriate health care for people in and nearby Grand Island, especially those individuals/families with limited resources or with other barriers to health care.

If funded, we commit to being your performance site. We commit to distributing your study's questionnaire within our clinic waiting room and auxiliary locations and collecting the questionnaires once participants have completed them, as well as dispense to participants the financial compensation provided from this grant. We also commit to sending the questionnaires to your location upon their completion in pre-paid addressed envelopes you provide.

Your project clearly addresses an important aspect of healthcare behaviors in a primary care setting. We highly value the promotion of evidence-based interventions for underserved populations. Your proposed study will give us an opportunity to evaluate and modify any necessary factors to increase treatment utilization and overall health among our patients who utilize our public health services.

Sincerely,

Teresa Anderson, APRN-CNS
Health Director

June 17, 2010

Krista Highland
kristahighland@gmail.com

Dear Krista:

We are pleased you have selected People's Health Center to include in your application for the AHRQ's Grants for Health Services Research Dissertation Program (R36) (PA-09-212), entitled, "Parental to Child Health Belief Transmission in Economically Disadvantaged Persons." People's Health Center provides affordable, accessible and culturally appropriate health care for people in the Lincoln, Nebraska, area, especially those individuals/families with limited resources or with other barriers to health care.

If funded, we commit to being your performance site. We commit to distributing your study's questionnaire within our clinic waiting room and auxiliary locations and collecting the questionnaires once participants have completed them, as well as dispense to participants the financial compensation provided from this grant. We also commit to sending the questionnaires to your location upon their completion in pre-paid addressed envelopes you will provide.

Your project clearly addresses an important aspect of healthcare behaviors in a primary care setting. We highly value the promotion of evidence-based interventions for underserved populations. Your proposed study will give us an opportunity to evaluate and modify and necessary factors to increase treatment utilization and overall health among our patients who utilize our public health services.

Sincerely,

Debra Shoemaker
Executive Director

1021 No. 27th Street · Lincoln, NE 68503-1803
Administration (402) 476-1640 ·Medical (402) 476-1455 ·Fax (402) 476-1670

April 7, 2010

Dear Krista,

We are delighted that you selected the South Heartland District Health Department to include in your application for the AHRQ's Grants for Health Services Research Dissertation Program (R36) (PA-09-212), entitled "Parental to Child Health Belief Transmission in Economically Disadvantaged Persons." South Heartland, as a combined health district, is dedicated to preserving and improving the health of the residents of various municipalities and townships within Adams, Clay, Nuckolls, and Webster Counties. We serve a population of 47,308 (2000 Census), of which 24,064 reside in the City of Hastings in Adams County (pop. 30,913). Through collaboration with other community agencies, leaders, and the South Heartland District Board and staff, our mission includes determining which public health services are needed and how that need may be met and financed. Our Vision is *Healthy People in Healthy Communities.*

If funded, we commit to being one of your performance sites. We commit to distributing your study's questionnaire within our clinic waiting room during Vaccine for Children clinics and auxiliary locations within the scope of our public health nurse activities. We agree to collect the questionnaires once participants have completed them, as well as dispense to participants the financial compensation provided from this grant. We also commit to sending the questionnaires to your location upon their completion in pre-paid addressed envelopes you provide.

Your project aligns with our public health improvement plan goals which were developed in 2007 as the result of two community needs assessment processes, one focused on Maternal/Child Health, and one reviewing the public health system (MAPP process). Our action on two of these improvement goals, one related to mental health and wellness and the other focused on promoting healthy living through physical activity, nutrition and safety, could benefit from the results your study. We hope your project will provide data that can also be used to address how some of the 10 essential services of public health are being met by the local public health system in our jurisdiction.

Thank you for including South Heartland District Health Department; we look forward to assisting you in this project.

Sincerely,

Michele M Bever

Michele M. Bever, PhD
Executive Director

606 N. Minnesota, Suite 2
~~914 W 4TH ST~~, HASTINGS NE 68901
TEL (402) 462-6211
1-877-238-7595
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