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Perceptions of Health among Latinx and Mexican Young Children in San Luis Potosí, Mexico and Illinois, United States: A Qualitative Study

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ABSTRACT

Background: Childhood obesity remains a critical global health issue that has been steadily increasing within the last 30 years. Although multiple interventions and programs have been implemented to limit the development of childhood obesity, most have failed. The failure of these programs is often attributable to the lack of engagement with the populations targeted. To increase the population's engagement, it is recommended to understand their motivations, barriers of implementation, and overall perceptions of health. Yet, little is known about perceptions of health among young children, in particular children from Latinx/Mexican background, who are at disproportionately higher risk for early childhood obesity.
Goal: This qualitative study aimed to identify the perceptions of health related to nutrition and physical activity of Latinx/Mexican children ages 4 – 6 in Mexico and the United States. Bandura's Social Learning Theory was used as a guiding framework to understand the reciprocal determinism factors and identify the cognitive, environmental, and behavioral influences that inform overall children's perceptions of health.
Methods: Mexican children in San Luis Potosi, Mexico and Latinx children in Champaign, Illinois, United States, were recruited as part of the Holistic Obesity Prevention Study (HOPS). In total, 12 Mexican children and 12 Latinx children were interviewed. Verbatim transcripts of the semi-structured interviews (n = 24) were analyzed as secondary de-identified data. Key themes of perceptions of health were identified through thematic analysis. Relational analysis of individual codes was categorized using reciprocal determinism factors of the Social Learning Theory.
Results: Four themes were identified: (1) differentiation among self/child and adults, (2) social interactions with others, (3) differences between healthy and unhealthy behaviors and habits, and (4) importance of preferences. We found that all reciprocal determinism factors were present, however, the environmental factor in the perceptions of health in Latinx/Mexican children was the most prominent.
Conclusion: Findings establishes that the environment is a key contributor—more than cognitive/personal and behavioral factors—to Latinx and Mexican children's perceptions of health. These findings highlight the importance of the environment and emphasize the need to consider the context when developing childhood obesity primordial prevention programs geared to improve the health of Latinx/Mexican children.

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CHAPTER I: INTRODUCTION

1.1 Introduction and Rationale

The childhood obesity epidemic continues to escalate over the years.[1] Within the United States, childhood obesity (ages 2 – 19) has a 19.7% prevalence which affects roughly 14.7 million children and adolescents.[1] Latinx and Mexican populations have one of the highest prevalence of obesity when compared with other racial/ethnic groups in the United States.[2] Hispanic children/adolescents aged 2-19 have a 26.2% obesity prevalence, which is higher than their non-Hispanic White 16.6%, Black 24.8%, and Asian 9.0% children/adolescent counterparts.[3] Childhood obesity is a risk factor for obesity as an adult. Correspondingly, Latinx and Mexican populations also have a greater adult obesity risk and related comorbidities such as cardiovascular disease in the United States compared to other ethnic/racial groups.[6]

In addition, there is greater risk for the development of childhood obesity at younger ages.[4] Kindergarten-aged children who have overweight are four times most likely to develop obesity than children who have normal weight.[5] Thus, when children have overweight in younger ages of their life, their risk of incident obesity is higher than children who have normal-weight.[5] There is a need to prevent the risk factors of childhood obesity to reduce the risk of adult obesity and obesity-related comorbidities.[7]

1.2 Problem Statement

Environmental and biological drivers contribute to risk factors of childhood obesity.[8-11] Some examples of environmental drivers are the home environment, education and cultural orientation.[8] In addition, certain biomarkers, such as adiponectin and leptin, are different among children of normal weight, overweight and obese.[10] These drivers are important to acknowledge when targeting risk factors of childhood obesity. Particularly in environmental drivers of

childhood obesity risk factors, there are different social, cultural, and structural contexts.[12] These contexts contribute to the ethnic/racial disparities among different populations. Since, Latinx and Mexican populations have a greater risk of developing childhood obesity, public health officials need to consider the social, cultural, and structural contexts of their environment.

A potential solution to target the risk factors of childhood obesity is through primordial prevention and interventions to promote the adoption of optimal health behaviors in early childhood in Latinx and Mexican populations.[13-14] Primordial prevention reduces the incidence of childhood obesity because it targets the risk factors of childhood obesity in different stages of life. In previous obesity preventions, there are environmental components that influence children health behaviors.[15] Examples of an environmental component are school, home, community, or healthcare.[15-20] In addition, most obesity preventions are diet and physical activity focused.[16-19] Although environmental and the type of interventions of previous obesity preventions have been identified, there is a lack of the effects of these elements in obesity prevention programs on children's perceptions of health. Thus, to create effective primordial prevention and intervention programs, public health officials need to understand the perceptions of health among the populations they are targeting.

Existing approaches on perceptions of health have been established, yet there is limited information on perceptions of health among young children. Previous research done on perceptions of health has focused on prepubertal children and adolescents.[21-25] Previous studies of perceptions of health among Hispanic and Mexican adolescents found that there is a strong emphasis on social groups and social environment.[22-25] Latinx/Mexican adolescents are aware of their health perceptions and its influences on their health behaviors, however, there is limited evidence in younger children ages 4 -6. Primordial prevention in early childhood is implied to be

more effective on targeting the risk factors of childhood obesity. There needs to be a primordial prevention that targets young children's perceptions of health to establish positive health behaviors.

There is limited research on perceptions of health among early aged children. However, to approach perceptions of this age group, public health officials need to consider the social learning theory. The social learning theory allows public health officials to organize children's perceptions of health in the context of existing childhood obesity programs. Social learning theory provides a framework to observe perceptions of health in young children. Social learning theory is a working model that highlights observation, imitation and modelling are key to the learning process.[26] Social learning theory contains reciprocal determinism factors: personal/cognitive, behavioral, and environmental.[26] The reciprocal determinism factors explain how behavior is learned through these contexts and they often intercorrelates with one another.[26] There is existing early childhood obesity prevention that applies the social learning framework.[27-30] These early childhood obesity preventions find that the social environment, such as parents and peers, influences the children's health behaviors.[27-30] To our knowledge, this study is the first to identify perceptions of health among young Latinx/Mexican children in Mexico and the US. Our study applies the social learning theory to shed light on how children's perceptions of health are influenced by the child's cognition, environment, and health behaviors.

1.3 Purpose Statement

This study aimed to identify perceptions of health among Latinx/Mexican children ages 4 -6. By using the Social Learning Theory, I aim to organize the perceptions of health into reciprocal determinism factors to see how cognition, environment, and behavior influence

children's perception of health. I hypothesize that children will have perceptions of health, and these perceptions of health are strongly influenced by the children's environment.

1.4 Significance Statement

Thus, this research aims to understand the perceptions of health among Latinx/Mexican children ages 4 - 6. The social learning theory provides an organizational framework to understand how the reciprocal determinism factors of health categorize these perceptions of health. In hope, this research will contribute into the childhood obesity conversation by introducing perceptions of health among Latinx/Mexican children ages 4 -6 as an important component to improve effective primordial prevention and intervention programs in similar populations and age groups.

1.5 Definition of Terms

Perceptions of Health: Children's attitudes, opinions, and beliefs of health when discussing topics of nutrition and physical activity.

Social Learning Theory: The theory that looks on how Latinx/Mexican children learn health behaviors by observation, model and imitation of others.

Thematic Analysis: A methodological approach that identifies and interprets patterns of Latinx/Mexican children's transcripts to create themes of children's perception of health (codes).

Relational Analysis: A methodological approach that examines the contextual relationship among reciprocal determinism factors derived from children's perceptions of health (individual codes).

Childhood Obesity: Children's chronic health condition where the child is above the healthy weight for age, height and sex assigned from birth.

Childhood obesity primordial prevention programs: These are programs that aim to prevent initial risk factors of childhood obesity.

BMI: Body Mass Index that is calculated by dividing weight (kg) by height (m).

Children with Normal/Healthy Weight: Children whose BMI Percentile for age and sex falls between the 5th percentile - 85th percentile.

Children with overweight: Children with a BMI Percentile in the range of 85th percentile – 95th percentile.

Children with obesity: Children with a BMI Percentile at the 95th percentile or greater

Children with severe obesity: 120% of the 95th percentile or greater

Reciprocal Determinism Factors: How the child's environment, health behaviors, and cognitions influence the child's perceptions of heath and health behaviors.

CHAPTER II: LITERATURE REVIEW

2.1 Introduction

The obesity epidemic is one of the rising global public health issues. According to WHO, obesity occurs regardless of age and socioeconomic groups and affects both developed and undeveloped countries.[7] There is a need for obesity prevention because obesity is a major risk factor for noncommunicable diseases. Noncommunicable diseases lead to chronic conditions that reduce the overall quality of life.[7]

This literature review dives into obesity, specifically childhood obesity, in the Latinx and Mexican population. This literature review investigates childhood obesity with specific lenses. The literature review divides into 6 sections: 1) Obesity among the Latinx and Mexican Population, 2) Life Course Approach to Disparities in Childhood Obesity, 3) Systematic Reviews on Obesity Prevention, 4) Existing Perceptions of Health among Latinx/Mexican Children and Adolescents, 5) Social Learning Theory, 5a) Social Learning Theory in Obesity Prevention, 6) Similar Studies that applied Social Learning Theory in Perceptions of Health among children and among Latinx and Mexican children. Ultimately, sections introduce the background information that support this study's investigation of the Latinx and Mexican children's perceptions of health with a social learning lens.

2.2 Obesity among Latinx and Mexican population

Prior to the Coronavirus pandemic (2020 – 2022), previous studies investigated obesity among the Latinx and Mexican population in the United States. Between 1999 and 2018, there was an increase in obesity among Mexican American adolescents, men, and women.[31-32] In addition, rates of severe obesity were different between Mexican American men and Mexican American women. Rates of obesity and severe obesity among Mexican American men had

increased from approximately 29% in 1999 to 51% in 2018. Meanwhile, Mexican American women experienced increases in obesity and severe obesity rates after 2009-2010 from approximately 39% to 49% in 2018.[31-32] By 2017 – 2018, there was an obesity prevalence of 44.8% among the Latinx population and 50.4% among the Mexican population in adults aged 20 and over.[2] The obesity rates of Mexican American while high, were not significantly different to the rates of other racial/ethnic groups because all populations had an increase in obesity and severe obesity from approximately 27% to 42% in men and approximately 34% to 42% in women.[32] Although there was no statistical significance, research cannot ignore the different rates of obesity. There needs to be further investigation on obesity and severe obesity trends after the Coronavirus pandemic.

According to the CDC, prevalence of childhood obesity (ages 2-19) in the United States is 19.7% and affected about 14.7 million children and adolescent in 2017-2020.[1] There were health disparities on childhood obesity among different racial and ethnic groups in the United States. Latinx and Mexican populations have a greater risk of obesity and related comorbidities such as cardiovascular disease in the United States.[6] Latinx children have a 26.6% risk of developing childhood obesity compared to non-Hispanic white children during 2017 – 2020.[1] Overall, Latinx and Mexican populations in the United States have a higher childhood obesity prevalence than non-Hispanic white children.[1-2,6]

Environmental and biological factors contributed to childhood obesity in Latinx/Mexican population within the United States. When looking into the parents of children with trajectories toward a healthy weight compared to stable obese weight in Latinx/Mexican population, the home environment played an important role.[8] Children with trajectories towards a health weight were more likely living in home environments with lower education, higher self-efficacy and

more Mexican cultural orientation compared to children with stable obese weight trajectories.[8] Negative home environments such as family instability, stress and maternal depression had a positive correlation with biological pathways like adiponectin and leptin in children.[9] Thus, as negative environments increased, the amount of adiponectin and leptin in children increased which led to negative health outcomes. Different social determinants of health such as education and home environment affected the child's biological factors of weight. In addition, there were 14 identified metabolites that were different among normal, overweight, and obese groups from Mexican American children ages 6 – 17.[10] The differences in quantities of biomarkers led to changes in body growth. For example, girls with overweight and obesity had earlier puberty than girls with normal weight.[11] These findings suggest that early puberty among girls could lead to future health issues such as breast cancer or early skeletal maturation. Overall, social environment and biological components of a child affected the risk of childhood obesity.[8-11]

Overall, all previous research acknowledged that obesity is an ongoing issue within the United States. Latinx and Mexican American population seemed to be affected in both adults and children. Lastly, there was evidence that the social environment such as maternal depression and cultural orientation, and biological factors such as hormones played a critical part in childhood obesity.

2.3 Early life as a critical window in Childhood Obesity

There are racial/ethnical disparities within each stage of life, starting even before conception.[12] During all stages, culture and acculturation shape potential risk factors for childhood obesity among different racial/ethnical groups.[12] For example, parents' view on their child's body image can lead them to encouraging health behaviors of excess eating or food restriction.[12]

In previous studies, the mother's pregnancy, the child's infancy period, and the child's early childhood stages were investigated for potential risk factors for childhood obesity. By using the social-ecological model, authors found there were risk factors for childhood obesity during the mother's pregnancy.[14] Mothers who were advised to attend overweight/obesity prevention programs during the pregnancy cycle were more likely to adopt positive health behaviors than mothers who did not attend overweight/obesity prevention programs during their pregnancy.[14] Next, mothers were encouraged to optimal breastfeeding and feeding practices.[14] The authors concluded that risk factors for childhood obesity can be reduced with the mother's involvement in pregnancy and infancy period.

Similarly, early childhood is an optimal age to evaluate risk factors for childhood obesity. From 1998 – 2010, Kindergarten children who had overweight were four times more likely to develop obesity than children who had normal weight.[4-5] These findings support that early childhood is a critical period to target the risk factors of having overweight.

Overweight and obesity at an early age are associated with a greater likelihood of chronic illnesses in adulthood. For example, childhood body size positively correlated with Type 1 Diabetes.[33] Children with obesity are twice as likely to develop T1D compared to children with normal weight.[33] Children with obesity are more likely to have high Alanine transaminase (ALT) levels than children with normal weight.[47] High ALT levels are a known risk factor for non-Alcoholic fatty Liver Disease.[47] Childhood weight is also a high and critical risk factor for developing adulthood cancer. There are positive association between BMI and different types of cancer such as thyroid cancer, leukemia, and non-Hodgkin lymphoma.[48] Thus, childhood obesity interventions not only target the risk of childhood obesity but also intervene in the likelihood of future chronic illnesses.

2.4 Systematic Reviews on Obesity Prevention

There have been numerous systematic reviews conducted on obesity prevention programs. Factors, such as environmental setting, strength of evidence, types of prevention programs, and age groups, informed public health officials of existing approaches to childhood obesity prevention programs. Most systematic reviews had an Americanized and Westernized perception of obesity.[15-16]

Across the systematic reviews, the environmental setting of obesity prevention programs was mentioned. The environmental setting consisted of the location of the obesity prevention intervention/program. The most common locations of the childhood obesity prevention programs were school, home, community, and healthcare.[16-20] Most childhood obesity prevention programs in the United States were conducted in a school setting.[15-16, 18]

Researchers acknowledged that different environmental settings attributed different effectiveness among childhood obesity programs.[16] Most existing childhood obesity prevention contained different strengths of evidence (SOE) that was measured by quantity, quality and consistency.[16] There was a high SOE among studies that implemented physical activity only or diet/physical activity interventions within school settings, involving home and community engagement.[16] Yet, there was a low SOE for interventions that incorporated both diet and physical activity in a childcare or healthcare setting.[16] The different levels of SOE informed researchers that the environmental setting was a critical factor in obesity prevention programs. In a previous systematic review, home-setting and parent/family interventions were more effective than clinical-setting and individualized interventions.[20] Regardless of these results, many obesity prevention programs were conducted in school-based settings.[20]

Most systematic reviews on obesity prevention were diet and physical activity focused.[16-20] Although diet and physical activity were prominent factors in child obesity prevention, there were social determinants of health factors such as racial/ethnic and socioeconomic differences in early risk factors for childhood obesity. For example, unhealthy diet behaviors such as higher consumption of sugar-sweetened beverages and fast food were more common among Black and Hispanic youth compared to white youth.[12] Research on the association of socioeconomic status of families and childhood obesity has shown it contributes by increasing obesity risk factors such as smoking during pregnancy and maternal depression.[12] Thus, childhood obesity prevention studies should also consider ways to address social determinants of childhood obesity.

The child's age in a childhood obesity prevention program affected the risk or likelihood of childhood obesity. For example, combined diet and physical activity interventions reduced the risk of obesity in children ages 0-5.[19] Physical activity interventions reduced the risk of obesity in children ages 6 – 12 years and adolescents ages 13 – 18 years.[19] There were no effective diet-only interventions among children ages 6-12 or 13-18, yet there was some evidence of effectiveness among combined interventions in these age groups.[19] Overall, the child's age during their participation in childhood obesity prevention programs led to different results of the effectiveness of the programs, and suggested that targeting earlier ages may yield more optimal outcomes.

2.5 Existing Perceptions of Health among Latinx/Mexican Children and Adolescents

A better understanding of children's perceptions of health can help inform childhood obesity prevention efforts. However, most research on perceptions of health had a demographic age group of prepuberty children and adolescents.[21-25] Previous research suggested that Latinx

and Mexican children and adolescents highlighted social environment, health literacy and knowledge, and health beliefs.

Latinx/Mexican children and adolescents relied on their social environment to form their perceptions of health.[22-25] Latinx adolescents valued familial relationships and safe communication with parents and family.[22] In addition, Latina girls viewed friendships as important to health.[23] Interestingly, social groups, such as family and friends, are seen as both facilitators and barriers in a healthy lifestyle.[24] Peer and family relationships shaped health perceptions.[25] Community involvement in childhood obesity prevention programs influenced the perceptions of health in adolescents.[22,25] Environmental topics, such as politics and climate were present among Latina girls adolescents perceptions.[23] Latinx adolescents noted culture influences in their health perceptions.[22,25]

Health literacy and knowledge played an important role in Latinx/Mexican adolescent's perceptions of health. There was a positive correlation between health literacy and health perceptions.[21] Adolescents who did not understand nor believe health behaviors and decisions affected their health as adults were less likely to practice positive health behaviors compared to adolescents who did understand or believe health behaviors and decision affected their health as adults.[21,23] Adolescents were less likely to be interested in health behaviors information if there was difficulty in comprehending health messages.[21] The misunderstanding of information among Latinx/Mexican adolescents negatively influenced their health behaviors and decisions. For example, food restriction was seen as a misconstruction of healthy eating behavior.[23] Limited food intake and monitoring meals were found in Latina girls ages 8 – 12.[23]

Latinx/Mexican adolescents noted multiple health beliefs. Overall, Latinx adolescents acknowledged self-expression and body image were important factors in health behaviors.[22,24]

Internal motivation and external familial and peer support were acting facilitators in successful weight loss.[24] However, some attitudes on perceptions of health were different among genders. Female adolescents were more likely to discuss weight struggles than men regardless of both genders having overweight or obesity.[24]

Within the age range of 8 – 16, Latinx/Mexican children were aware of their health perceptions. Yet, there was limited information on perceptions of health among young Latinx/Mexican children and its influences on their health behaviors.

2.6 Social Constructivism Theory and Social Learning Theory

Social constructivism theory and social learning theory are limited frameworks in existing childhood obesity prevention. Social constructivism theory is defined as 'where and how one creates their beliefs through experiences and observations'.[35] Children's experiences and observations of health behaviors formulate their health perceptions. There is a symbolic interactionalism in the creation of health perceptions.[36-38] The creation of health perceptions arises from interaction with others in social processes.[36-38] This symbolic interactionalism influences the meanings of health.[36-38] Children rely on their social processes in early childhood development.[28] Perceptions of health among young children provide meaning to health behaviors.[39]

Social learning theory is defined as the learning process that occurs through observation, imitation, and modelling.[26] Since early childhood development relies on children's observations, imitations, and modeling to build health behaviors, the social learning theory provides a framework to categorize young children's health behaviors and perceptions. Social learning theory consists of reciprocal determinism factors: personal/cognitive, behavioral, and environmental that intercorrelate with one another.[26]

2.6a Social Learning Theory in Obesity Prevention

There was limited evidence of the social learning theory in existing childhood obesity prevention programs. Most studies highlighted the social environment, such as parents and peers, shaped young children's health behaviors.[27-30] For example, there was an existing parent training in a childhood obesity prevention program that provided a positive impact on children's health.[29-30] Authors found that parent training reduced the child's risk of having overweight among preschool Latinx children living in low-income household.[29] These results uncovered the importance of children's observations and imitations of their parents' behaviors. In addition, parents who attended child-feeding practices had a positive impact on their child's acceptance and intake patterns.[30] From these previous findings, social environment, specifically parents, positively influenced their children's health behaviors. The authors also found that school policies and practices reinforced positive diet and physical activity health behaviors.[30] Lastly, children's self-efficacy, knowledge about health, health media use, and dietary behaviors were influenced by their peers and adults.[28] Thus, the intergenerational socialization process and environmental components of the social learning theory guided children's health behaviors.

2.7 Social Learning Theory in the Childhood Obesity Literature

Social learning theory offered a different behavioral change model compared to other behavioral models such as the socioecological model and health belief model.[42] For example, social learning theory was mostly used alone or in combination with other models in existing childhood obesity programs.[40,42,44] The social learning model empathized the child's environmental and social processes, the child's health behavior and the child's health beliefs. This multilevel approach model allowed multiple factors into consideration in the formation of

children's health perceptions. Some factors highlighted are the relationship between family behaviors and health behaviors, home environment, peer support, and neighborhood safety.[42]

In a study that involved Hispanic boys ages 8-12, negative health perceptions were present.[41] Authors found that Hispanic boys had perceptions of health that were: 1) limited and superficial understanding of health, nutrition, and activity, 2) based on muscular appearance frequency of exercise, and messages obtained through the media, 3) negative towards children who have overweight and their physical performance, 4) influenced by infrequent and unstructured family meals, 5) influenced by preferences with fast food restaurant, buffets, and entertainment, 6) influenced by neighborhood safety on participation in physical activity.[41] Thus, social environment, peer influences, and media portrayal of body image influenced the perceptions of health in Hispanic boys.

The child's assigned sex and social environment influenced perceptions of physical activity level among Hispanic students.[43] There were different perceptions of health among sexes and racial/ethnical groups in elementary school children. Hispanic boys were more likely to be active than Hispanic girls because their peers encouraged positive physical activity behaviors.[43] Yet, they found a high social support factor among both genders.[43] Self-efficacy was less present in Hispanic students than in non-Hispanic white students.[43] Self-efficacy should be further investigated among different race/ethnic groups.

Significant correlations were present between children's dietary behaviors and environmental, behavioral, and cognitive factors.[44] Multiple methodologies highlighted that these factors intersected to influence children's knowledge, self-efficacy, and healthy lifestyle choices.[44] There was evidence of different effectiveness of childhood obesity prevention programs based on the physical and social environmental influences, promotion of health

behaviors, and child's health beliefs.[40,44] The most effective interventions had: 1) combined high levels of parental involvement and interactive school-based learning, 2) targeted physical activity and dietary change and 3) included long-term follow-up.[40] Thus, the intersectionality of reciprocal determinism factors influenced dietary behavior change in children.[44]

2.8 Conclusion and Study Aims

Overall, in the childhood obesity prevention literature we documented the importance of health perceptions, as drivers of behavior change, but limited research on perceptions of health among early-aged Latinx and Mexican children. This study aims to identity and understand the perceptions of health among Latinx/Mexican children ages 4 – 6 by utilizing the social learning theory as an organizational framework. In hope, this research will elucidate the perceptions of health among Latinx/Mexican children ages 4 -6 as an important component to improve effective primordial prevention and intervention programs.

CHAPTER III: METHODOLOGY

3.1 Study Design

This study examined qualitative data from interviews conducted with Latinx and Mexican children in Mexico and the US, as part of the Holistic Obesity Prevention Study (HOPS). HOPS is a binational qualitative, cross-sectional study that recruited Latina immigrant and Mexican mothers of preschool-aged children and their preschool-aged children. Both mothers and children were interviewed about their knowledge, attitudes, and beliefs regarding obesity through a semi-structured interview guide. Data was collected in San Luis Potosi, Mexico, and Central Illinois, US. Data was collected from January to February 2016 in Mexico. In the US, data was collected from February to April 2016. In total, 48 interviews were collected among Latinx immigrants and Mexican mothers (n=24) and preschool-aged children (n=24). This study focused on the nutritional and physical portion of children's interviews conducted with children in Mexico (n=12) and the U.S. (n=12). Study design, methods, and findings from the interviews conducted with the mothers have been published previously.[45,46]

3.2 Recruitment and Eligibility

Children were eligible to participate if they: a) were 5 – 6 years old, b) had at least one parent who is Mexican, c) and spoke English, Spanish, or both. Recruitment was conducted through flyer distribution among all mothers who had a child attending a kindergarten located in a low-income, semi-urban neighborhood on the outskirts of San Luis Potosi, SLP. In the U.S., recruitment materials were distributed in local community centers, public parks, laundromats, and local churches across semi-urban cities in Central Illinois. Snowball sampling strategies and referrals from community leaders were also used to support the recruitment of participants in the US.

Children received a $20 incentive to compensate them and their parents for their participation in the study. Prior to data collection, researchers highlighted voluntary participation and collected written consent from parents and verbal assent from children. The HOPS study was approved by the Institutional Review Board (IRB) from the University of Illinois at Urbana-Champaign (IRB Approval #16113), and in Mexico, by the Kindergarten's Principal and the Secretary of Education of the Government of the State of San Luis Potosi, Mexico *(Secretaría de Educación de Gobierno del Estado, SEGE).*

3.3 Data Collection Procedures

Data was collected with a semi-structured questionnaire shown in **Appendix A**. Semi-structured interview guides were designed and piloted by a transdisciplinary team with expertise in public health human development, nutrition, and social work. Children were prompted to draw a picture of a healthy family. Next, the children were asked to discuss their picture with questions surrounding their perceptions of nutrition, and physical activity. Data were collected in the participant's preferred language of English or Spanish. Field notes were taken. Interviews were audio recorded and professionally transcribed verbatim in their original language. Transcripts were de-identified prior to analysis. The interview duration averaged approximately 45 minutes.

3.4 Theoretical Framework: Social Constructivism Grounded Theory & Social Learning Theory

This study utilized social grounded theory to create themes through children's experiences and observations.[35] Grounded theory originates from sociology specifically from symbolic interactions, which posits that meaning is negotiated and understood through interaction with others in social processes.[36-38] In this context, we developed subjective meanings

of perceptions of health from the discussion with children.[39] The subjective meaning of health perceptions was embedded into Bandura's model of reciprocal determinism.[22]

3.5 Data Analysis

A secondary analysis was conducted using the MAXQDA 2022 program. All analysis was conducted in English for consistency. There were three phases of data analysis and four cycles of coding that were carried out combining deductive and inductive approaches.

The first phase of data analysis began with the initial memoing of all 24 transcripts. First, 8 transcripts were randomly selected to create the initial codebook (4 of Mexican children and 4 of US children). Then, theoretical sampling was conducted for the remaining 16 transcripts. Theoretical sampling was done by coding the remaining transcripts with the initial codebook that was composed of the randomized 8 transcripts (**Table 1**). To ensure the codebook's reliability, the initial codebook was compared and revised with a codebook developed previously in this study.

The second phase was composed of thematic analysis which included focused coding that was carried out by grouping codes into subthemes, and subthemes into themes. The second phase's objective was to find themes that were Latinx/Mexican children's perceptions of health. To organize the codes developed in the initial coding phase, we developed subthemes that grouped the codes based on patterns and similarities. For example, the "Types of exercises" codes share features with "Eat healthy food." Both codes were grouped into the category "Children's general knowledge of physical activity and nutrition" (**Table 5**). Subthemes were then organized by similar features to create different themes. In the case of the subtheme "Children's general knowledge of physical activity and nutrition", this subtheme was combined

with “Children's general knowledge of unhealthy behaviors and habits” to create the “Differences between healthy and unhealthy habits” theme (**Table 5**).

The third phase was composed of relational analysis. The third phase’s objective was to observe how Latinx/Mexican children’s perceptions of health fit into Bandura’s Social Learning Theory. The relational analysis examined the relationship between the reciprocal determinism factors using axial coding and visualizations of the code co-occurrence model. Axial coding was conducted by categorizing individual codes into a reciprocal determinism factor: environmental, behavioral, and cognitive/personal. Important to note that most individual codes fall under two or more factors (**Table 2**). For example, the “Being Happy” code fell under all reciprocal determinism factors (**Figure 1**). The code co-occurrence model was created to visually observe relationships among personal/cognitive, behavioral, and environmental factors. A conceptual model was provided as an illustration of the perceptions of health in Latinx and Mexican children ages 4 – 6 (**Figure 1**).

3.6 Reflexivity

I am a first-generation Guatemalan cis-female born in the United States My interest in the Latinx population arose from my own identity. Through my own experiences, I acknowledged that my positionality of health perceptions influenced my data analyses of perceptions of health among Latinx/Mexican children ages 4 – 6. I considered myself an insider of the Latinx culture, however, I viewed myself as an outsider of the Mexican culture. This acknowledgement addresses my positionality that can influenced the results of my research.

CHAPTER IV: RESULTS

From the thematic analysis, four core themes emerged from discussions of nutrition and physical activity. These themes were: (1) differentiation among self/child and adults, (2) social interactions with others, (3) differences between healthy and unhealthy behaviors and habits, and (4) importance of preferences. Within the core themes, there were subthemes that were identified from patterns in the individual codes. The three core themes that contained two subthemes were: (1) differentiation among self/child and adults, (2) social interactions with others, and (3) differences between healthy and unhealthy behaviors and habits. Within differentiation among self/child and adults, children distinguished their perceptions of self-image and adulthood. Among children's social interactions with others, they perceived playtime engagement and familial engagement. Within differences between healthy and unhealthy behaviors and habits, children understood general knowledge of both healthy and unhealthy behaviors and habits. There were twenty-four individual codes identified and described (**Table 1**).

In the relational analysis, the three reciprocal determinism factors of Bandura's social learning theory: personal/cognitive, behavioral, and environmental were used to organize the relationship between individual codes (**Table 2**). Some individual codes align with more than one reciprocal determinism factor. After matching all individual codes with their respective determinism factor(s), the relationships illustrated in **Figure 1** among the reciprocal determinism factors were observed.

4.1 Thematic Analysis

4.1a Differentiation among self/child and adults

Children displayed awareness of themselves and adults in the discussions of nutrition and physical activity. This theme highlighted how children distinguish themselves from adults through health habits/behaviors. There were clear differences between children's and adults' roles. Two subthemes were found within children's perceptions of themselves and others: the child's self-image and the child's view of adulthood (**Table 3**).

Child's self-image. Most children expressed their roles and health habits with emotions. Children spoke about *being happy, skinny, strong, independent, and safe*. Since there were emotions tied to a child's self-image, children spoke about their health habits and behaviors in the form of expectations, beliefs, and personality characteristics. In the example below, the child explained her behavior of eating by herself with pride because she stated that she is a big girl. The child viewed being independent as a form of justifying her eating behavior. There were other similar emotions of children describing themselves as being healthy such as *being strong* as their favorite superhero.

Interviewer (I): ¿Tu Mama' no come contigo? *Participant (P): No* *I: ¿Porque No come contigo tu Mama'?* *P: Porque Yo ya soy una Niña grande y tengo que comer solita*	*Interviewer (I): And your mom doesn't eat with you?* *Participant (P): No* *I: Why doesn't your mom eat with you?* *P: Because I am a big girl and I need to eat alone*

Children's views on adulthood. In conversations about nutrition and physical activity, children relied on observations of adults' roles within their families. Children described adulthood in terms of their parents' and grandparents' health behaviors. Children spoke about *adults cooking, exercising, and needing to work*. Children mentioned their experiences and the context of adults in their lives to describe their perceptions of adulthood. For example, one child mentioned that their father didn't want to play with them because he needed to work to earn money. This child viewed that adults' role, specifically their father, is to bring money to the family. The child displayed the expectations of adults needing to work to earn money because they observed their father working.

P: Mi Papa' no quiere Jugar conmigo *I: ¿Por qué No?* *P: Porque el Necesita Trabajar Ganar dinero*	*P: My dad doesn't want to play with me* *I: Why not?* *P: Because he needs to work to earn money*

4.1b Social interaction with others

Children highlighted their social interactions with others. They spoke about their friends and family interactions with them. Most examples were from school playtime and family activities, yet there was a presence of electronics within their social interaction with others. Two subthemes emerged within social interaction with others: playtime engagement and familial engagement (**Table 4**).

Playtime Engagement. In playtime engagement, children mentioned *playing with children and adults*. There were different types of playtime activities such as *playing with electronics*, playing

physical games, and make-believe/fantasy play. Children played video games on game consoles and phones with children or their parents. Physical games consisted of activities such as tag, hide-and-seek, and duck-duck-goose. Make-believe/fantasy play included playing pretend scenarios and make-believe stories. Environmental settings, such as schools, homes, or parks were described as key features of the context in which children's playtime narratives took place. For example, one child spoke about playing Pac-Man with their father, and their father taught them how to play gun games. The social environment of playtime engagement with their father through video games shaped how the child perceives playtime behavior.

I: ¿Y tú Papá? *P: Si el si juega conmigo A Pac Man* *I: ¿Qué más juegas con tu Papá?* *P: Bueno mi papa me enseño un juego de las pistolas pero, por que se y juega conmigo mi papa el Pac man y gano yo y mi Papá*	*I: And your dad?* *P: Yes, he plays with me Pac Man* *I: What else do you play with your dad?* *P: Well, my dad taught me a gun game but because I know and he plays with me my dad and I won against my dad*

Family Engagement. Children mentioned how their family spends time with each other. The social environment of familial engagement took place within the child's home, recreational locations, and extended families' homes. Family activities included *cooking, talking during mealtimes, eating together, and spending time together as a family*. Children's social environment was mentioned throughout their recollection of familial engagement. The social environment and health behavior were often described together. One child mentioned breaking

eggs and adding flour to meat when their family cooks together. The social environment of their father and mother's roles in the kitchen was mentioned when the child described their health behavior of breaking eggs and adding flour to meat.

I: ¿Quién más le ayuda a tu Mama a Cocinar? *P: Mi Papa con los Bistec* *I: ¿Cómo le ayuda tu Papa?* *P: Es que le echan la Harina, y yo a veces rompo los huevos y a si los pongo y también pongo la carne a si con la harinilla*	*I: Who else helps your mom cook?* *P: My dad with steaks* *I: How does your dad help your mom?* *P: He adds flour and sometimes I break the eggs and put them in and I also put the meat in with the flour*

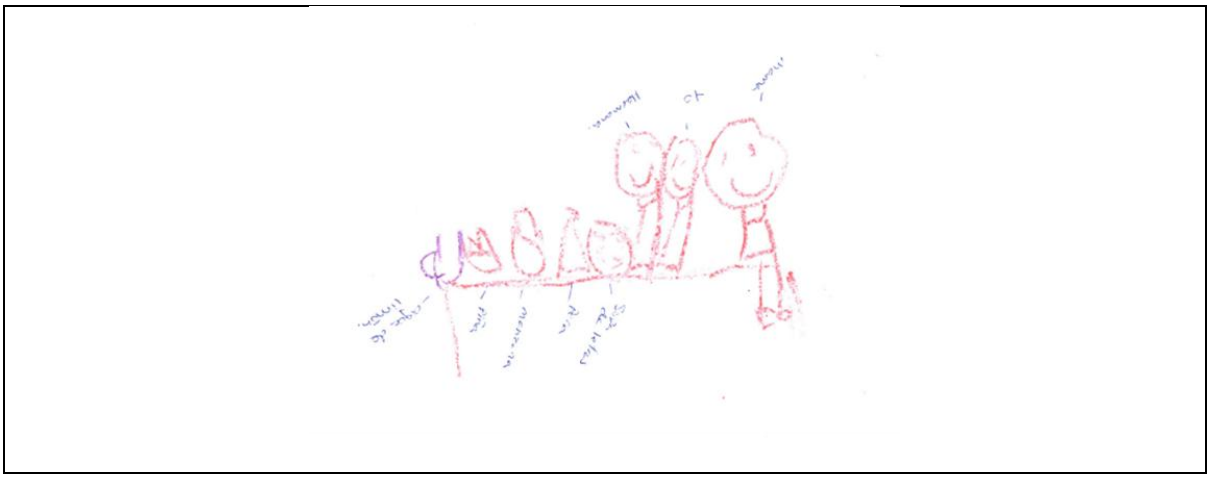
4.1c Differences between healthy and unhealthy behaviors and habits

Children had knowledge of nutrition and physical activity and recognized the difference between unhealthy behaviors and habits (**Table 5**). The differences arose from their assumptions and beliefs of healthy/unhealthy habits and behaviors, their social environment, and the behavior itself. In discussions involving nutrition, children highlighted the quality and quantity of food.

Children's general knowledge of nutrition and physical activity. Children had knowledge of nutrition and physical activity. They spoke about *exercises, eating healthy food, and healthy food quantities*. Children mentioned different types of exercise, including endurance and strength training such as running, riding a bike, and lifting weights. Balance and flexibility exercises such as yoga and stretching were not mentioned by children. Children discussed their knowledge and assumptions about *eating healthy food.* Their parents and eating preferences informed their

knowledge and assumptions of healthy foods. For example, a child mentioned cake was healthy, likely due to her preference for sweets. Children also spoke about the *quantity of food* they eat, stating that less food is considered healthier than more food intake. Their health beliefs were informed by their health behaviors and social environment. For example, in a child's drawing of a healthy family, the child drew a family mealtime. When describing the image, the child mentioned that they set up the table with soup, vegetables, and fruits to eat, so they can be healthy and skinny, both interpreted as healthy. In this example, the social environment of their family, the eating behavior of eating soup, vegetables, and fruit, and the belief that being skinny is healthy influenced the child's perception of health.

I: ¡A Muy Bien! Oye ahora vamos a ver el dibujo de la Familia, Que Bonito dibujas Oye a ver Platícame de tu Dibujo ¿Que está pasando en este dibujo? *P: Ellos pusieron una mesa para agarrar la comida o sopa o verduras o Fruta y están agarrando para comer y que estén Flaquitos, saludables*	*I: Very good! Hey now let's see the drawing of the Family, How Beautiful you draw Hey let's see Tell me about your Drawing. What is happening in this drawing?* *P: They set up a table to grab food or soup or vegetables or fruit and they are grabbing it to eat and be skinny, healthy*



Children's general knowledge of unhealthy behaviors and habits. Children discussed unhealthy behaviors and habits such as *being fat, not being sick, eating too much, and eating comida chatarra o chucherías*. Children highlighted the physical appearance of a person as a factor of health. The physical characteristic *of being fat* was considered unhealthy for children. In addition, some children recognized *sickness* as being unhealthy and described health behaviors and habits such as washing hands and cleaning food as preventative measures to avoid getting sick. The quantity of food factored into the recognition of the differences between healthy and unhealthy behaviors and habits. Some children mentioned that *eating too much* is unhealthy because being fat is unhealthy. Lastly, children mentioned food that is *chatarra* and *chuchería*, both Spanish terms closely resemble the term *junk* food. In the example below, the child spoke about an unhealthy family that eats *pura chuchería* and it makes him/her fat, which is not healthy. The child's perception of being unhealthy involves being fat and eating *chucheria* these beliefs are likely informed by his/her social environment, most likely their family.

I: ¿Y cómo es una Familia que no es saludable?	*I: And what is a family that is not healthy like?*

P: Pura chuchería y engorda eso no es Saludable	*P: Pure 'junk and it makes you fat, that's not healthy*

4.1d Importance of Preferences

Children displayed preferences in certain health behaviors/habits. Children highlighted preferences in their health perceptions as a justification for their health behaviors and habits. When asked about healthy foods, children mentioned their preferred foods. The preferred foods they mentioned were not always healthy. Also, children discussed their physical activity preferences as a form of healthy behavior. For example, one child mentioned liking it when their family does certain health behaviors, such as eating together, just because they like it. Within this example, the child mentioned the social environment of their family, their preference for family activity, and the family activity being the health behavior.

I: ¿Te gusta que tu familia haga todo eso? *P: Si* *I: ¿Por qué?* *P: Porque si*	*I: Do you like when your family does all that?* *P: Yes* *I: Why?* *P: Because yes*

4.2 Relational Analysis

4.2a Reciprocal Determinism Factors Identified in Individual Codes

Applying Bandura's Social Learning Theory, there were reciprocal determinism factors that influenced a person's health behavior. These reciprocal determinism factors are the child's environment, cognition, and behavior. All reciprocal determinism factors were identified within

the individual codes included in the codebook (**Table 2**). *Adult exercises* was the only individual code that solely had an environmental influence because all children spoke about adult exercises through observations of their parents or grandparents. Seven out of the twenty-four individual codes had all reciprocal factors that influence the child's health perceptions. These codes were *being happy, being safe, eating healthy food, no comieron ninguna comida Chatarra, preference, types of exercises, and unhealthy -being fat.* The remaining sixteen individual codes were composed of two reciprocal determinism factors that influence children's perception of health.

4.2b Relationship between Reciprocal Determinism Factors

In relational analysis, there was an established relationship among reciprocal determinism factors (**Figure 1**). The intersectionality of codes displayed the reciprocal determinism factors' connectivity. Based on the size of the code text, environmental factors were most prominent in children's health perceptions followed by behavioral and personal/cognitive factors. Although there were connections between all factors, behavioral and environmental factors had the most intersections of codes which consist of 235 intersections. Behavioral and environmental had the strongest connectivity. Personal/cognitive and behavioral factors had the lowest intersection with only 139 codes intersected which results in having the lowest connectivity.

CHAPTER V: DISCUSSION

5.1 Overall Findings

This study aimed to identify perceptions of health among Latinx/Mexican children ages 4 -6. Through thematic analysis, we defined four core themes of perceptions of health among Latinx/Mexican children ages 4 – 6 in Mexico and the US: (1) Children had different perceptions of health among self/child and adults, (2) Children rely on social interaction to develop their knowledge and perceptions, (3) Children distinguish differences between healthy and unhealthy behaviors and habits, and (4) Children display their preferences within their perceptions of health. The overall key finding is that young Latinx/Mexican children construct their perceptions of health and adopt health behaviors based on their environment more than on their behaviors and cognition.

5.2 Environmental Factors in Perceptions of Health

Young Latinx/Mexican children highlighted the environmental setting within perceptions of health. Environmental setting was identified as the social and physical environmental aspects of a child's health behavior. Children highlighted familial ties and friend networks as key aspects of their social environment. Children mentioned their social relationships with others to describe their perceptions of health. In addition, Young Latinx/Mexican children described their environment frequently to articulate their perceptions of health and health behaviors. Locations such as schools, recreation centers, and kitchens were common locations among young Latinx/Mexican children. Thus, the environmental component of childhood obesity prevention programs is a key factor in promoting healthy behaviors among kindergarten-aged children.

Similar to previous studies, environmental setting influences the effectiveness of childhood obesity primordial prevention programs.[12] Most children mentioned their home

environment when sharing details of health behaviors such as cooking and eating with family members. Most existing obesity prevention emphasized school and home settings rather than community and healthcare settings.[11-16] These results support that home settings are a foundation for perceptions of health and health behaviors in early childhood. Thus, it is critical to understand the environmental setting to promote children's positive health behaviors.

5.3 Latinx/Mexican Children's Perceptions of Health

Our findings suggested that Latinx/Mexican children ages 4 -6 had specific perceptions of health. For example, children observed children and adults displaying similar health behaviors, yet identified different external and internal determinism reciprocal factors, such as environment and beliefs, that influenced the health behaviors of children and adults. Children discussed adult's health behaviors based on their observations of the adults in their lives. In contrast, children describe their own health behaviors based on their preferences and social groups. Children noted social interaction with peers and family as factors shaping their health behaviors. Kindergarten-aged children had a distinction between healthy and unhealthy eating and activity behaviors due to observations, imitation, and modeling.[35] Although there was a strong influence on the environment, children rely on their own beliefs and preferences for health behaviors.

Similarly to previous results, researchers found that the intersectionality of the child's environment, beliefs, and behaviors influences dietary behavior change in children.[44] Reciprocal determinism factors highlight that children rely on multiple factors in shaping their perceptions of health, yet our study found that some factors are emphasized differently among children and adults. Our results align with previous studies that emphasize young children, prepuberty children, and adolescents considering their social environment factor when shaping their

perceptions of health.[17-21] Our study supports that kindergarten-aged children understand the differences between healthy and unhealthy behaviors, suggesting that early childhood provides the ideal age target for obesity prevention programs.

5.4 Strengths and Limitations

Strengths of this study include the two types of analysis to determine the perceptions of health and how these perceptions are shaped based on the Social Learning Theory. This approach utilized reciprocal determinism factors to understand how cognitive, behavioral, and environmental processes influence children's health behaviors. In addition, this study had a sample of Mexican and US children to observe if there were cultural differences among health behaviors.

Some of the limitations of the study take place in the methodology. The snowballing sampling relies on referrals which can lead to sampling bias in Mexico and the US. In addition, this study focuses on low-income families which is not representative of all Latinx/Mexican families in Mexico and the US. Lastly, data collection took place in 2016 thus further research is encouraged post-COVID pandemic.

CHAPTER VI: PUBLIC HEALTH IMPLICATIONS

Childhood obesity interventions have previously been unsuccessful due to lack of population's engagement. Public health officials are encouraged to investigate the specific perceptions of health of young children to increase the engagement of the target population with their prevention programs or interventions. While early childhood is recognized as an ideal target age to implement obesity prevention programs, to our knowledge, this is the first study investigating young children's perceptions. The overall key finding in this thesis is that young Latinx/Mexican children construct their perceptions of health and adopt health behaviors based on their environment more than on their behaviors and cognition. The importance of the environmental component and the perceptions of health identified can inform future childhood obesity prevention programs. These findings highlight the importance of promoting positive health behaviors through environmental-tailored strategies geared towards Latinx/Mexican kindergarten- aged children.

Childhood obesity prevention programs should focus on community health interventions rather than individually tailored interventions while looking at the child's environment, beliefs, and behaviors. In particular, early childhood obesity prevention programs are encouraged to target the social involvement of children, including parents, friends, and community members.

In conclusion, this study applied the Social Learning Theory framework to organize the perceptions of health among Latinx/Mexican children ages 4 -6 in Mexico and the United States. Findings from this study encourage the implementation of efforts focusing on children's perceptions to prevent childhood obesity among Latinx and Mexican children. Overall, these findings suggest that the environmental component informing children's perceptions of health needs to be carefully examined and targeted by childhood obesity prevention programs.

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TABLE 1. CODES, CODE DESCRIPTION AND FREQUENCY OF THE CODEBOOK

Code	Code Description	Frequency
all codes		407
adult cooking	Deductive. This code refers to when a child mentions that a parent, grandparent or someone older cooks. Examples: "My mom cooks"	35
adult exercises	Deductive. This code refers when a child mentions when their parents/extended family exercises.	20
adults need to work	Deductive. This code refers to when a child mentions that their parents or grandparents work. This may include references to exercising or play time.	12
being happy	Deductive. This code refers when a child mentions that a healthy family is a happy family.	7
being independent	Deductive. This code refers when a child being independent.	3
being safe	Deductive. This code refers why child mentions why they don't help in kitchen, exercise or talk while eating. Some examples include "I am not big or I am little"	11
being skinny	Deductive. This code refers when a child mentions that healthy means being skinny.	6
being strong	Deductive. This code refers when a child mention being strong is associated to nutrition or physical activity (exercises).	5
being together as a family	Deductive. This code refers when a child mention being together as a family.	2
cooking together	Deductive. This code refers when they cook together as a family during mealtimes.	7
doesn't eat a lot	Deductive. This code refers when a child mentions that to be healthy is by not eating a lot.	3
doing activities together	Deductive. This code mentions how a child sees how healthy families doing things that is normal to the child.	27
eat healthy food	Deductive. In this code, a child mentions what healthy families eat.	22
eating together	Deductive. This code refers when the child mentions eating with their family.	22
no comieron ninguna comida Chatarra	In-vivo. This code will refer to comida chatarra such as junk food or food that is not good for you.	5
Not being sick	Deductive. This code represented when a child knows that healthy means that they are not sick or have sick behaviors.	2
playing with adults	Deductive. This code refers when a child mention playing with their parents or extended family	25
playing with electronics	Deductive. This code refers when the child mentions playing videogames. Electronics include can be phone, tablet, and game consoles.	13
playing with other children	Deductive. This code refers when a child mention playing with other children such as cousins and friends.	26

Code	Code Description	Frequency
preference	Deductive. This code refers when a child explicitly mentions that they like something. This something can refer to a food or activity.	46
talking with family	Deductive. This code refers when a child mention talking with their family during mealtimes.	6
type of exercises	Deductive. This code refers when a child mentions a type of exercise when referring to the question “What exercises do you or your family do?".	35
unhealthy - being fat	Deductive. This code refers when a child mentions that being fat is unhealthy.	13
unhealthy - eating too much	Deductive. This code refers when a child mention eating too much.	6

TABLE 2. CODES AND THEIR CORRESPONDING RECIPROCAL DETERMINISM FACTOR(S)

Code	Reciprocal Determinism Factors
adult cooking	Personal/Cognitive, Environmental
adult exercises	Environmental
adults need to work	Personal/Cognitive, Environmental
being happy	Personal/Cognitive, Behavior, Environmental
being independent	Personal/Cognitive, Behavior
being safe	Personal/Cognitive, Behavior, Environmental
being skinny	Personal/Cognitive, Environmental
being strong	Personal/Cognitive, Behavior
being together as a family	Personal/Cognitive, Environmental
cooking together	Behavioral, Environmental
doesn't eat a lot	Personal/Cognitive, Behavior
doing activities together	Behavioral, Environmental
eat healthy food	Personal/Cognitive, Behavior, Environmental
eating together	Behavioral, Environmental
no comieron ninguna comida Chatarra	Personal/Cognitive, Behavior, Environmental
Not being sick	Personal/Cognitive, Behavior
playing with adults	Behavioral, Environmental
playing with electronics	Behavioral, Environmental
playing with other children	Behavioral, Environmental
preference	Personal/Cognitive, Behavior, Environmental
talking with family	Behavioral, Environmental
type of exercises	Personal/Cognitive, Behavior, Environmental
unhealthy - being fat	Personal/Cognitive, Behavior, Environmental
unhealthy - eating too much	Personal/Cognitive, Behavior

TABLE 3. SUBTHEMES, CODES AND DIRECT QUOTATIONS FOR THE THEME: DIFFERENTIATION AMONG SELF/CHILD AND ADULTS

Subthemes	Codes	Direct Quotation
Child's self-image	Being Happy	I: ¿Qué están haciendo? P: Felices porque están comiendo vegetales y frutas
	Being Skinny	I: ¿Cómo sabes que están saludables? P: Porque están Flaquitos I: ¿Están Saludables porque están Flaquitos?
	Being Strong	I: ¿Oye y que tienen que comer los Niños? ¿Hay algo que tengan que comer los niños para crecer? P: Vegetales I: ¿Por qué? P: Para que sean Grandes y Fuerte
	Being Independent	I: ¿Tu Mama' no come contigo? P: No I: ¿Porque No come contigo tu Mama'? P: Porque Yo ya soy una Niña grande y tengo que comer solita
	Being Safe	I: ¿No te gusta hacer ejercicio? P: No I: ¿Por qué no? P: Me da miedo I: ¿Por qué te da miedo? P: Porque mi Mama' me ha cuidado mucho
Child's views on adulthood	Adults Need to Work	I: ¿A que juega tu Papa' contigo? P: Mi Papa' no quiere Jugar conmigo I: ¿Por qué No? P: Porque el Necesita Trabajar Ganar dinero
	Adult Exercises	I: ¿Oye y te gusta hacer ejercicio? No, ¿Por qué no te gusta hacer ejercicio? P: Porque mi papá va al Gym I: ¿Tu Papá va al Gym? ¿Qué hace tu Papá? P: Tiene pesas Grandotas
	Adults Cooking	I: ¡A Muy Bien! Oye a ver Platícame ¿Quién te da de comer? P: Mi Abuela, Mi papá, Mi Abuelo y también cuando no está Mi Mamá me da mi Abuelo o mi Tía.

TABLE 4. SUBTHEMES, CODES AND DIRECT QUOTATIONS FOR THE THEME: SOCIAL INTERACTION WITH OTHERS

Subthemes	Codes	Direct Quotation
Playtime Engagement	Playing with Other Children	I: ¡A Muy Bien! ¿Te gusta jugar? P: Con mis Amigos Si
	Playing With Adults	P: I do play with him because he has work off on Friday's
	Playing With Electronics	I: ¿A qué te gusta juagar? P: Ha, Halo I: ¿Cómo juegas eso? P: Son con los Controles del Xbox
Familial engagement	Doing Activities Together	P: And we get to have family movie night.
	Cooking Together	I: ¿Quién más le ayuda a tu Mama a Cocinar? P: Mi Papa con los Bistec I: ¿Cómo le ayuda tu Papa? P: Es que le echan la Harina, y yo a veces rompo los huevos y a si los pongo y también pongo la carne a si con la harinilla
	Talking With Family	P: Well, I, I take, I take one scoop and then I wait until I'm done chewing and then I talk a little. I: What do you talk about? P: Umm that we like chili and what we do, without my dad with my mom when he's at work
	Eating Together	I: ¿Es una Familia Saludable? P: Si I: A ver ¿Que están Haciendo? P: Andan todos desayunando en Familia
	Being Together As a family	I: Oye, y Te gusta cuando tu Familia comen Juntos P: Si I: ¿Por qué te gusta? P: Porque estamos toda la Familia

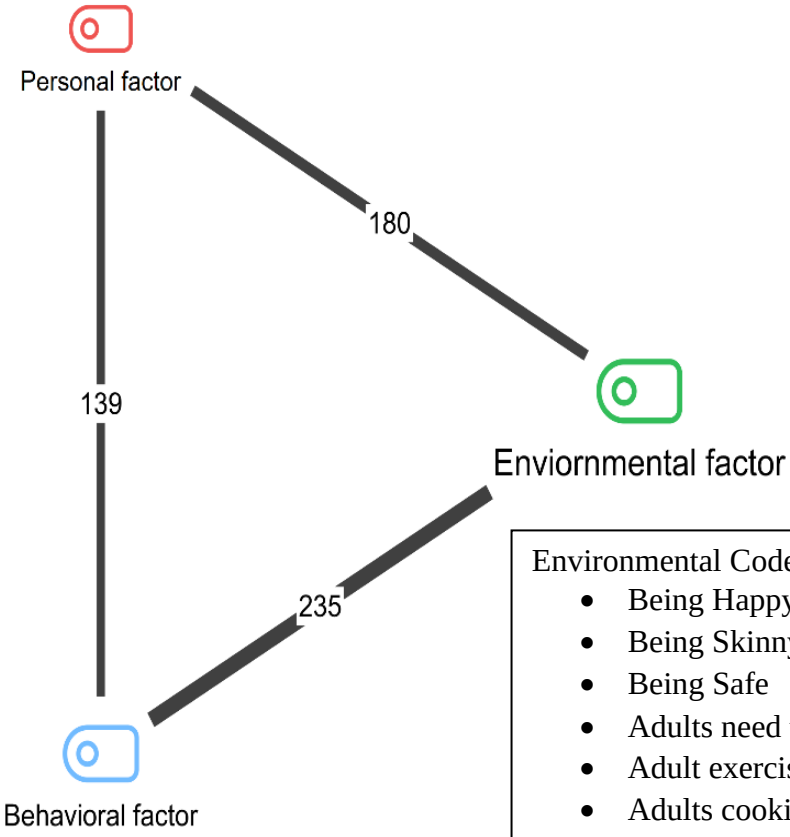
TABLE 5. SUBTHEMES, CODES AND DIRECT QUOTATIONS FOR THE THEME: DIFFERENCES BETWEEN HEALTHY AND UNHEALTHY BEHAVIORS AND HABITS

Subthemes	Codes	Direct Quotation
Children's general knowledge of nutrition and physical activity	Types of Exercises	I: ¿Oye y que otros Ejercicios haces? P: A ver pues hago, pues agarro mis manos en la cintura y a veces le hago a si y pues levanto a si el talón
	Eat Healthy Food	I: ¡A Muy Bien! Oye ahora vamos a ver el dibujo de la Familia, Que Bonito dibujas Oye a ver Platícame de tu Dibujo ¿Que está pasando en este dibujo? P: Ellos pusieron una mesa para agarrar la comida o sopa o verduras o Fruta y están agarrando para comer y que estén Flaquitos, saludables
	Doesn't Eat A lot	I: Oye y por qué esta saludable esta Familia, ¿Cómo Sabes que esta saludable? P: Porque no comen mucho y ya I: No comen Mucho, ¿Qué más hace? P: Comen de un Plato, un plato de comida mira primero aquí se la paso para que se la den al último para que se las pasen al rojo y al naranjado y al café, al azul, al negro, al amarillo.
Children's general knowledge of unhealthy behaviors and habits	No Comerion Ninguna Comida Chatarra	I: ¿O que las mamás estén saludables? P: Cuando mi Mamá come algo es pura comida chatarra I: ¿Qué es la comida chatarra? P: La comida chatarra es por si alguien se enferma
	Unhealthy - Being Fat	I: ¿Y los Gordos están Saludables? P: Mmm, No I: ¿Por qué no están saludables los Gordos? P: Porque, porque comen demasiado
	Not Being Sick	I: ¿Y las Familias saludables comen Tortas? ¿Qué más hacen las Familias Saludables? P: Comen Hamburguesas y se lavan las Manos, Para que no, para que no este, para que no entren Virus
	Unhealthy - Eating Too Much	I: ¿Te Gusta? P: Pero a veces me engordo y me dicen en el carate que no debo de comer tanta pizza

FIGURE 1. RELATIONAL ANALYSIS OF RECIPROCAL DETERMINISM FACTORS

Personal Codes:

- Being Happy
- Being Skinny
- Being Strong
- Being Independent
- Being Safe
- Adults need to work
- Adults cooking
- Being Together as a family
- Types of exercises
- Eat healthy food
- Doesn't eat a lot
- No comerion ninguna comida chatarra
- Unhealthy -being fat
- Not being sick
- Unhealthy – eating too much
- preference



Behavioral Codes:

- Being happy
- Being Strong
- Being Independent
- Being Safe
- Playing with other children
- Playing with adults
- Playing with electronics
- Doing Activities Together
- Cooking Together
- Talking with family
- Eating together
- Types of exercises
- Eat healthy food
- Doesn't eat a lot
- No comerion ninguna comida chatarra
- Unhealthy - being fat
- Not being sick
- Unhealthy – eating too much
- preference

Environmental Codes:

- Being Happy
- Being Skinny
- Being Safe
- Adults need to work
- Adult exercises
- Adults cooking
- Playing with other children
- Playing with adults
- Playing with electronics
- Doing activities together
- Cooking together
- Talking with Family
- Eating together
- Being together as a family
- Types of exercises
- Eat healthy food
- No comerion ninguna comida chitarra
- Unhealthy – being fat
- Preference

APPENDIX A: HOPS INTERVIEW GUIDE

HOPS: Holistic Obesity Prevention Study with Mexican Mothers and Preschool-Aged Children.

Entrevista de niños

Spanish – Final

October 14, 2015

Participant ID #: |___|___|___|___|___|___|___| (Int's initials / 3-digit sequential # / MX/US)

Date: |___|___| / |___|___| / |_2_|_0_|_1_|_5_| (mm/dd/yyyy)

Interviewer *(Check One):* ☐1 LA ☐2 MP ☐3_____

Location *(Check One):* ☐1 OFFICE ☐2 HOME ☐3 SCHOOL ☐4 OTHER _____

Language*:* ☐1 English ☐2 Spanish

Introduction

Start Time: _____ : _____ AM / PM

¡Hola! ¿Te llamas [CHILD NAME]? Mucho gusto en conocerte. Yo me llamo [INTERVIEWER NAME] Liliana.

¡Gracias por aceptar jugar conmigo! Me da mucho gusto platicar contigo hoy. Antes de que empecemos, te quiero contar de mi proyecto que se llama HOPS. Que en inglés quiere decir saltos de conejitos. Este proyecto es para aprender sobre diferentes temas de salud. La meta es usar la información para ayudar a las mamás y a los niños a que no se enfermen.

En esta reunión vamos a jugar diferentes juegos, vamos a dibujar y vamos a pretender que tú eres mi maestro(a). Cuando pretendemos que tú eres mi maestro(a), te voy a hacer unas preguntas para que tú me expliques unas cosas a mí. Como estamos jugando, no hay respuestas correcta ni incorrectas. Si hay algo que no sepas, sólo dime y nos podemos saltar eso.

Antes de que empecemos tengo que revisar este papel contigo. Pregúntame cualquier duda que tengas.

PLACE THE CONSENT FORM IN FRONT OF PARTICIPANT

Section I. Informed Consent

Aquí está el formulario de consentimiento. Vamos a revisarlo juntos/as. Este documento explica lo siguiente:

- Esta entrevista durará más o menos 45 minutos. Si necesitas ir al baño, o tomar un receso, solo avísame, y podemos ir a pedirle a tu mami que te lleve.
- No hay respuestas correctas ni incorrectas. Me interesa saber lo que tú piensas, y aprender de ti. Si en algún momento decides que ya no quieres hacer esto conmigo, podemos dejar de hacerlo. Si hay alguna actividad que no quieres hacer, o si quieres saltarte alguna pregunta o actividad, sólo avísame.
- Nadie más, además de nosotros va a saber lo que me dijiste hoy. No voy a compartir la información que me des con nadie.
- Voy a grabar esta sesión, pero solo para que no se me olvide lo que me digas porque tengo muy mala memoria.

Si tienes alguna pregunta, avísame. Cuando estés listo(a) pon una palomita en la forma. Así ☑

1. DID PARTICIPANT HAVE ANY QUESTIONS OR CONCERNS?

☐1 Yes → PLEASE SPECIFY BELOW:

☐2 No

2. DID PARTICIPANT MARK THE CONSENT FORM?

☐1 Yes

☐2 No → **(END INTERVIEW)**

3. DID PARTICIPANT AGREE TO AUDIO-TAPE?

☐1 Yes

☐2 No → **(END INTERVIEW)**

Section III. Qualitative Interview

¡Esto es muy interesante! Estoy aprendiendo muchisimo. Muchas gracias.

Ahora, tengo una caja de crayolas y quiero pedirte que hagas 3 dibujos para mí: 1) primero dibuja una familia saludable, 2) dibuja una persona que tenga diabetes, y 3) dibuja a alguien que tenga sobrepeso o obesidad.

PROBES FOR DIABETES: **alguien que tenga el azúcar alto/ que este enfermo del azúcar**

PROBES FOR OBESITY: **que pese mucho, que este gordo o gorda**

IF NOT CHILD DOES NOT UNDERSTAND "DIABETES"OR OVERWEIGHT OR OBESE CHECK CORRESPONDING BOX BELOW. IF ALTERNATIVE PROBES ARE USED, DOCUMENT PROBES USED.

☐ CHILD DOES NOT UNDERSTAND DIABETES. DIABETES PROBES WERE USED.

☐ DIABETES SECTION WAS SKIPPED.

☐ CHILD DOES NOT UNDERSTAND "OVERWEIGHT OR OBESE". PROBES WERE USED.

DRAWING TIME

Gracias por dibujar esto para mí. ¡Estos dibujos están muy bonitos!

Quiero grabar esta parte de la entrevista, entonces voy a prender mi grabadora ahora.

TURN ON THE TAPE RECORDER, THEN SAY: **Vamos a grabar que me das permiso de grabar nuestra conversación. ¿Me das permiso de grabar?**

IF CHILD ANSWERS NO. TURN OFF TAPE RECORDER AND END THE INTERVIEW.

NUTRITION AND PHYSICAL ACTIVITY QUESTIONS

Vamos a ver tu dibujo de una familia saludable. ¿Puedes decirme que está pasando en este dibujo?

_____
_

IF NOT MENTIONED PROBE TO SEE IF THEY DRAW THEMSELVES/ THEIR FAMILY: **¿Esta es tu familia?**

_____
_

IF NOT MENTIONED PROBE FOR ANY BEHAVIORS BEING CARRIED ON: **¿Qué estás haciendo tú en este dibujo? / ¿Qué está haciendo este niño/ esta niña?**

_____
__

¿Te gusta que tú familia haga eso?
_____

¿Cada cuando lo hacen? *Probe to see if R would like to do it more often*
_____

IF NOT MENTIONED IN DRAWING:
Ahora cuéntame sobre tus comidas con tu familia.

NPAQ1. ¿Quién es la persona encargada de preparar la comida? *Probe to see if R participated in meal preparation*

_____
_

NPAQ2. ¿En qué cuarto de la casa comen? *Probe to see if TV is on while eating.*

_____
_

NAPQ3. ¿Dónde está tu familia cuando tú estas comiendo? *Probe to see if eat with parents or children alone.*
_____
_

PHYSICAL ACTIVITY ASSESSMENT

Ahora quiero que me cuentes sobre cosas que te gusta hacer y juegos que te gusta jugar.
PAQ1. ¿Cuál es tu juego favorito? …. Yo no sé jugar eso, ¿cómo se juega? ¿Con quién juegas eso?

_____

PAQ2. ¿Hay algún juego que juegues con tu familia? ¿Cuáles? *Probe for frequency.*

_____

PAQ2. ¿Te gusta hacer ejercicio/ actividad física? ¿Qué tipo de ejercicio te gusta hacer?

_____

PAQ3. ¿Hace ejercicio tu papá o tu mamá? *If not mentioned:* **¿Cada cuándo?**

_____