Examining Family-Level Mechanisms and Processes that Affect Children's Sleep and Weight Health within the Neighborhood

by

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ABSTRACT

Sleep and weight health during childhood can be the essential building blocks that influence later physical and psychological health. Researchers note how neighborhood effects on health may be mediated or moderated by parenting or family-related factors. This dissertation expanded on the efforts through an examination of contextual predictors of children's health using the Arizona Twin Project dataset (N = 933; 51.7% female; 56.5% White; 25.6% Latino). The family stress model (FSM), contextual relevance model (CRM), and the integrated model were used to test the relations between neighborhood and family factors on children sleep and weight health. Parent perceptions of neighborhood danger and childhood opportunities index were tested using multilevel-mediation, moderation, and moderated mediation models to address some of the limitations in previous reviews. The FSM was partially supported: parental stress and strain mediated the association between perceived neighborhood danger with sleep efficiency. However, the FSM was not fully supported as parental stress and disrupted parenting did not serially mediate the associations between neighborhood conditions and sleep efficiency. Moderation analyses revealed that negative parenting exacerbates associations between perceived neighborhood danger and sleep duration, demonstrating amplified disadvantages processes of the CRM. Negative parenting also moderated the associations between perceived neighborhood danger and sleep efficiency; the relationship was beyond what was noted in the CRM. Greater neighborhood opportunity was more strongly related to greater body fat percentage in families with higher positive parenting, as compared to families with lower positive parenting. Familism significantly moderated the association between neighborhood contexts and parental stress and strain within a subsample (Latino descent only). Last, the exploratory multilevel moderated mediation models suggested that most associations did not vary by the subgroups explored (i.e., positive parenting, familism cultural value). These results join a growing initiative to explore the science of ecological context, culture, and family interplay.

DEDICATION

I dedicate my dissertation work to my Umma and Appa.

항상 응원해주셔서 감사합니다. 엄마 아빠, 사랑해요!

I also dedicate this dissertation to those who marched for the California Dream Act (AB 540, AB 130, AB 131). I hope that the Prop 308 in Arizona gives Dreamers living in Arizona the opportunity to pursue their dreams.

I give special thanks to those who worked on the Deferred Action for Childhood Arrivals (DACA) Program and the Military Accessions Vital to National Interest (MAVNI) Program.

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CHAPTER 1

INTRODUCTION

Social determinants of health are conditions that affect a wide range of health outcomes (United States Department of Health and Human Services [USDHHS], 2021). Neighborhoods present a differential distribution of resources and risks for their residents, reinforcing the existing stratification of social groups and producing health disparities across communities (Minh et al., 2017). Extensive scholarship has demonstrated a relationship between neighborhood ecological contexts with children and youth health outcomes such as sleep (Pabayo et al., 2014; Mayne et al., 2021a), physical health (for reviews, see Christian 2014; Ding et al., 2011), and mental health (for reviews see, Alderton et al., 2019; Leventhal & Brooks-Gunn, 2003; Xue et al., 2005). Accessibility of health-promoting neighborhood infrastructure and perceived usability or comfort within the space have been positively associated with health outcomes across the lifespan (Christian et al., 2015; Jacobs, 2011). These findings note the direct effects of neighborhood (dis)advantage on health across the lifespan.

To further evaluate the impacts of neighborhood dimensions on health, the present dissertation examines two health outcomes: sleep health and weight health. Sleep is an essential foundation for cognitive performance, mood, and overall health among children (Astill et al., 2012; El-Sheikh & Sadeh, 2015; Gregory & Sadeh, 2012; Hairston et al., 2016; Maasalo et al., 2016; Pavvonen et al., 2010). Poor sleep may have a long-term compounding impact on health (e.g., mental health, cognitive functioning, later insomnia; Fernandez-Mendoza et al., 2022; Hoedlmoser, 2020; Ong et al., 2006). Similarly, weight health during childhood is associated with subsequent physical health, social and emotional well-being, self-esteem, and mental health (Morrison et al., 2015; for review, see Sahoo et al., 2015). Poor weight health may also lead to chronic diseases in later life (e.g., obesity-related cardiometabolic complications; for review, see Piché et al., 2018).

Though the evidence may be sufficient to note the importance of both subjective and objective neighborhood dimensions on health, there is concern that such correlational findings may have limited capacity to inform policies and interventions to address the existing health disparities (Kubrin & Weitzer, 2003; Sampson et al., 2002; van Vuuren et al., 2014). From the methodological standpoint, developing reliable and validated measures of neighborhoods that reflect lived experiences is valuable in advancing the understanding of place effects on health (Diez-Roux, 2001; Noah, 2015). This highlights the importance of both objective and subjective measures of neighborhoods to represent various aspects of the ecological context. From the empirical standpoint, further examining the underlying processes, mechanisms, or pathways through which neighborhoods imprint onto individual health longitudinally may narrow the existing knowledge gap (Diez-Roux, 2001; Sharkey & Faber, 2014).

One of the key processes that should be investigated while examining children's health is the family process. Living in disadvantaged neighborhoods with low opportunities extends beyond the health risks. Research notes that various levels of the family processes are also affected by the neighborhood conditions. For example, lack of economic and social opportunities (e.g., well-paying employment opportunities, transportation) in disadvantaged neighborhoods may limit the ability of parents to spend the time to demonstrate health-promoting behaviors (Cattell, 2001; Christiansen et al., 2013) and other positive family attributes (e.g., marital harmony, family functioning, mental health; Benson et al., 2003; Kohen et al., 2008; Ross, 2000; Santiago, Wadsworth, & Stump, 2011). Research notes that parents are influenced by the neighborhood context and use different types of parenting in relation to how they perceive the neighborhood (e.g., danger, disadvantage, disengagement). Furthermore, economically disadvantaged parents experience added stress and strain based on the day-to-day challenges they experience while living in areas with fewer opportunities (Guterman et al., 2009; Maguire-Jack& Wang, 2016). Parents' experiences within the neighborhood context and their impact on parenting and the parent-child relationship may further elucidate how disadvantaged neighborhoods affect children's health. The present dissertation utilizes the family stress model and contextual relevance model to examine the broader processes by which neighborhood dimensions and family processes influence children's health (Conger & Conger, 2002; Roche & Leventhal, 2009).

Furthermore, the role of community—and family—culture may be especially relevant for children, particularly among ethnic minority youth who are disproportionately represented in neighborhoods with greater vulnerabilities (García Coll et al., 1996; Velez-Agosto et al., 2017; Wilson, 2020). Indeed, racialized housing markets and residential segregation introduced biases that resulted in differential opportunities and racial/ethnic health disparities today (Barr, 2019; Hedefalk, 2020; Osypuk & Acevedo-Garcia, 2010). Ethnic-racial labels in the neighborhood, familism values, or person-context congruence are a few examples of these family and cultural assets and resources that may have a protective (i.e., buffering effects), promotive (i.e., direct effects), or mediating role in child and adolescent development (Pasco & White 2020; Pasco, White, & Seaton, 2021; Romero et al., 2020). The multidimensional roles of community, family, and cultural assets that are modeled in the integrated model (White, Roosa, & Zeiders, 2012) were explored in the present dissertation to further contribute to the existing studies that highlight cultural values' protective or promotive qualities on health, especially among those who live in places with vulnerabilities.

Given these opportunities to advance the existing literature, the current dissertation first examined the relationship between neighborhood-level factors (i.e., perceived neighborhood danger, child opportunities index) on sleep and weight health. Next, the potential mediating and moderating roles of family processes (e.g., parenting, parental stress and strain) on the links between neighborhood contexts and health were examined using the models provided by the family stress model and contextual relevance model (Conger & Conger, 2002; Roche & Leventhal, 2009). Lastly, the moderating role of parent's cultural values (e.g., familism) on the associations between neighborhood-level factors (i.e., perceived neighborhood danger, child opportunities index) and parental stress and strain were examined using the integrated model (White, Roosa, & Zeiders, 2012). Each of these models and pathways are represented in Figure 1 and are further discussed in the next sections of the introduction.

Theoretical Frameworks for Place Effects on Health

Relational Developmental Systems

The relational developmental systems (RDS) theory emphasizes the mutually influential relations between individuals and contexts across development (Lerner, 2006; Overton, 2013) and moves away from reductionism and determinism (Damon & Lerner, 2008). A distinctive feature of the RDS theory is the recognition of *relative plasticity* in human development such that development can be change-sensitive and has the potential for change throughout one's development through the interaction of the individual and multiple levels of changing contexts (Baltes, Lindemberger, & Staudinger, 2006; Overton, 2003). The RDS theory is integrated within the broader developmental systems theory, which includes the physiological, behavioral, and social, ecological, cultural, and historical processes (Damon & Lerner, 2008; Lerner & Benson, 2013). These multilevel processes also reflect the levels of ecological systems defined by the bioecological systems model (micro-, meso-, exo-, macro-, and chrono- systems; Bronfenbrenner & Morris, 2006).

The RDS theory has provided a methodological rationale for representing multiple levels of ecological systems during research design, measurement, sampling, and data analysis (Geldhof et al., 2014). The present dissertation draws from the RDS theory by incorporating the different levels of ecological systems (e.g., individual, family, and neighborhood). It also utilizes both objective dimensions and subjective perceptions of neighborhoods to note the conceptual difference between the availability of neighborhood services (e.g., objective) and the perceived useability of the space (e.g., subjective). In addition, novel methodological approaches were incorporated into the study (e.g., observed parenting, objective and subjective sleep measures). The methodological rationale and the value of the novel approaches for each of the measures are presented later in the introduction.

Neighborhood Effects on Sleep

Evidence suggests associations between various dimensions of neighborhoods (e.g., neighborhood SES, physical, social) and children's sleep (Mayne et al., 2021a). Neighborhood SES is one of the most frequently examined neighborhood attributes (40 out of 85 studies reviewed in Mayne et al., 2021a). Neighborhood SES is typically represented using census-level aggregates or indicators (e.g., proportion within the area living under poverty rates, median income). Across the existing studies, lower neighborhood SES was typically associated with shorter sleep duration, later sleep onset, and higher rates of sleep apnea (for review, see Mayne et al., 2021a). How neighborhood SES influences sleep may be further elucidated by research that examines how social and physical dimensions of a neighborhood affect children's sleep.

Looking at physical dimensions, more urban conditions (e.g., densely populated) are associated with shorter sleep durations (Bottino et al., 2012; Patte, Qian, & Leatherdale, 2017), sleep apnea (Brouillette et al., 2011), and higher odds of sleep problems (Signh & Kenney, 2013) for infants, children, and youth than those living in less dense areas. Poorer physical conditions (e.g., dilapidated housing, poor sidewalk, and unsafe conditions) were associated with a higher prevalence of sleep problems among children (Singh & Kenney, 2013). Better physical conditions (e.g., the density of tree canopy cover, lower noise resolutions, perceived noise, and light pollution) were associated with better sleep quality, greater sleep duration, earlier sleep onset, and greater maintenance of sleep for children and youth (Chepesiuk, 2009; Mayne et al., 2021b; Pirrera, De Valck, & Cluydts, 2010). Studies that have examined subjective and objective physical attributes of neighborhoods have found associations that are generally expected. However, there are a few limitations that future studies can address. First, many studies have utilized single indicators of physical attributes rather than a weighted indicator that denotes the overall physical conditions of the neighborhood. A composite of the general physical conditions of the neighborhood may be a better representation of the broad opportunities that promote health and wellbeing rather than the commonly used single indicator (e.g., availability of parks; Abel, Barclay, & Payne, 2016; Guillaume et al., 2016). Furthermore, an index that is representative of the opportunities at a broad geographical scale may provide opportunities for comparability of findings not seen across neighborhood studies (Chaix et al., 2009).

Separate from the examination of physical dimensions of neighborhoods on children's sleep, research has examined the role of social dimensions of neighborhoods on sleep health as well. Studies found that greater social fragmentations (e.g., neighborhood disorder, disorganization, lower social cohesion, lower collective efficacy) were associated with decreased sleep duration (Hawkins & Takeuchi, 2016; MacKinnon, Tomfohr-Madsen, & Tough, 2021; Pabayo et al., 2014), greater perceived sleep problems (Rubens et al., 2018), and later timing of sleep onset (Graham et al., 2020). However, the association is less consistent as some studies have found no association between social dimensions of neighborhoods with sleep health (Aguilar-Farias et al., 2020; Rubens et al., 2020; Street et al., 2018; Troxel et al., 2017; Williamson et al., 2019). Possible explanations for the differences in findings may be a result of how the social dimensions were conceptualized and operationalized. Studies examining the impact of the social dimensions on children's sleep commonly used reports of perceived danger, a sense of community (e.g., social cohesion, collective efficacy), and social connectedness (e.g., satisfaction, embeddedness; Mayne et al., 2021a). However, these constructs may conceptualize different social attributes in the neighborhood, resulting in different findings. Furthermore, Mayne and colleagues (2021a) note that using participant-perceived reports of the neighborhood social conditions may be limiting. Indeed, other studies have recommended alternative methods to objectively operationalize neighborhood social dimensions (e.g., systematic field observations, averaging neighbor's perceptions of the neighborhood, socio-spatial neighborhood estimation method; Cutchin et al., 2012; Do et al., 2011; Zenk et al., 2007).

The present dissertation considers the limitations noted in the review and incorporates a new measure of neighborhoods: Childhood Opportunities Index (COI). The COI is a strengths-based approach to quantify multiple dimensions of neighborhoods (i.e., educational and social resource indicators, healthy environment and health resource indicators, neighborhood compositional indicators) at a national, state, and metropolitan area level. Its novel uses in the existing literature and a more detailed review of the COI is offered in a later section of the introduction. Furthermore, Mayne and colleagues (2021a) noted that many of the existing studies utilized a cross-sectional approach to examining place effects on children and youth sleep outcomes. There are calls for more longitudinal approaches. The present dissertation examined the associations between neighborhood opportunities and parents' perception of danger in the neighborhood at age 8 and later sleep health at age 10, accounting for the sleep health at age 8. Lastly, as a response to the call for more use of objective sleep measures (Mayne et al., 2021a), the present dissertation uses multiple sleep indicators (e.g., objective sleep duration, objective sleep efficiency, and parental reports of their child's sleep problems). The objective sleep dimensions (e.g., sleep duration, sleep efficiency) were determined based on existing research that has examined neighborhood effects on objective sleep (Mayne et al., 2021a).

Neighborhood Effects on Weight Health

According to the National Center for Health Statistics' National Health and Nutrition Examination Survey (2018), among children and adolescents ages 2 – 19, about 16.1% are classified as overweight, about 19.3% are classified as obese, and about 6.1% are classified as severely obese. With the rising concerns surrounding obesity rates in children and youth in the United States (Sanyaolu et al., 2019), researchers have noted the influence of neighborhood qualities that contribute to this unhealthy trend (Black & Macinko, 2008; Diez-Roux & Mair, 2010). Indeed, evidence suggests that living in an economically deprived neighborhood increases one's odds of having a high body mass index (BMI), even after controlling for family-level SES (Janssen et al., 2006; Van Lenthe & Mackenback, 2002). The most common method of assessing weight status is through BMI. However, there is a rising concern about the misleading classification of BMI, especially with children and adolescents whose weight may not scale with height during physical development (Etchison et al., 2011; Widhalm et al., 2001). Since the BMI is a proxy measure of children's body fat percentage; therefore, existing research recommends using body fat percentage as a weight indicator for children and youth (Oliosa et al., 2019). However, since the existing literature on the role of neighborhoods on weight health has more frequently used physical activity, dietary behavior, and BMI as indicators of weight health—the present literature review included the studies using these indicators as weight health outcomes.

Accumulating empirical literature suggests that certain neighborhood conditions inhibit children's physical activity, which is inversely related to children's weight status (for review, see Black & Macinko, 2008; Chung et al., 2012). Not surprisingly, greater availability and accessibility to physical activity resources, which typically differ by neighborhood SES, promoted physical activity for children (Estabrooks, Lee, & Gyurcsik, 2003). Furthermore, there is some evidence that greater walkability, greater proximity to recreation facilities, and higher density of parks were associated with more self-reported physical activity but not objectively measured physical activity (for review, see Ding et al., 2011). Another review noted a strong positive association between neighborhood green spaces and more physical activity among children, youth, and adults (for review, see James et al., 2015). The existing literature on the effects of neighborhood conditions on weight health may also benefit from a composite that conceptualizes the availability and accessibility of opportunities in the neighborhood. Therefore, the present dissertation uses a composite of indices noting overall neighborhood opportunities (e.g., COI) to predict weight health, measured with body fat percentage rather than BMI.

In addition to the significant main effects of neighborhood physical dimensions, evidence supports the separate influence of neighborhood social conditions. Neighborhood social environments (e.g., crime-related safety, community disorders) were inversely associated with physical activity such that greater objective and subjective crime and greater social disorder predicted lower subjectively and objectively reported physical activities (for reviews, see Ding et al., 2011; Rees-Punia, Hathaway, & Gay, 2018). Similarly, neighborhood crime and parents' concerns about high traffic and road safety were associated with greater BMI among children (for review, see Black & Macinko, 2008). Within Ding and colleagues' review (2011), the social dimensions were most consistently associated with objective measures of physical activity, highlighting the importance of examining social conditions as a predictor of weight health. In addition to these cross-sectional studies that provide evidence supporting the importance of social environment, there are longitudinal studies that reemphasize the argument.

For example, the Moving to Opportunity (MTO) for Fair Housing participants changed contexts from disadvantaged neighborhoods to advantaged neighborhoods (e.g., improved housing quality, lower neighborhood violence). It was hypothesized that this move to a more favorable environment would provide children and youth with neighborhood conditions that are typically associated with healthy weight status. Unfortunately, the positive impact researchers hoped to see through the contextual shift change was not observed in the first four-year follow-up study (Fortson & Sanbonmatsu, 2010). There were questions regarding the length of residency needed to positively impact children and youth health (Del Giudice et al., 2011; Kwan, 2012). However, a later 9 – 13 years follow-up found that there were negligible effects of improved housing quality on youth physical health outcomes (i.e., self-reported overall health, asthma, accidents or injuries, and BMI; Gennetian et al., 2012). A possible explanation for the non-significant findings may have been the parent-reported assessments of children's health. There is also the possibility that the families did not perceive their new environment as welcoming and useable as they felt they did not belong. Evidence suggests that low sense of belonging in the neighborhood is associated with low use of neighborhood contexts—even if they are health-promoting (Eriksson & Emmelin, 2013; Mujahid et al., 2007; Triguero-Mas et al., 2021). Therefore, in addition to the objective measure of neighborhoods (e.g., COI), the present dissertation also uses a subjective measure (e.g., parent's report of perceived danger) to predict children's later weight health.

In addition to the direct role of neighborhood objective and perceived conditions, there is evidence to support the need to investigate the role of parents when examining place effects on health. Especially during childhood, parents may have a high degree of control over their children's physical activity and dietary behavior (Holt et al., 2009; Scaglioni et al., 2006). The co-occurrence of multiple health behaviors (e.g., physical activity, healthy dietary behaviors, screen time) among the mother-father-child triad was significantly related to children's weight health (Niermann, Spendler, & Gubbels, 2018). Parents' perceptions of greater neighborhood availability and accessibility (i.e., high quality walking or cycling infrastructures, traffic safety) were associated with boys' and girls' higher physical activity (Meester et al., 2014). Additionally, parents' perceptions of neighborhood danger were negatively associated with their children's use of the available green space (Esteban-Cornejo et al., 2016; for review, see Timperio et al., 2004) and positively associated with their overweight status (Lumeng et al., 2006). These studies invite further investigation to better understand the role of parents' perceptions or behaviors on their children's weight health. As such, the present dissertation focuses on positive and negative parenting as well as parental stress and strain as possible processes or mechanisms by which neighborhoods affect children's health. Parents' potential interactive or mediating role is further discussed in the later section of the introduction.

Child Opportunities Index

The child opportunities index (COI) is a new index examining various dimensions of a neighborhood at the national, state, and city levels. The broad dimensions encompass education, social and economic, and health environment resources. The index is a compilation of 29 objective indicators gathered from numerous federally funded sources (e.g., Civil Rights Data Collection, National Center for Education Statistics, American Community Survey, Environmental Protection Agency, Centers for Disease Control and Prevention [CDC]). The COI addresses the existing limitations, such as the need to broaden how neighborhood dimensions are operationalized (e.g., neighborhood SES, perceived safety, single census-level indicator; Mayne et al., 2021a). The COI answers the call to move away from single-item indicators of neighborhoods and better assess contextual variability across the neighborhoods (O'Brien Caughy, O'Campo, & Brodsky, 1999).

Researchers have noted that the present method of examining compositional characteristics (e.g., census-level population size and density, neighborhood SES, mixed land use, residential mobility, and racial/ethnic heterogeneity) decontextualizes developmental processes (Kubrin & Weitzer, 2003; Luke, 2005). Though the evidence may be sufficient to associate certain neighborhood characteristics with observed health outcomes, recent empirical studies demonstrate that such a simplistic examination of place effects does not align with the complexities of the place effects on health (Braveman, 2014; Diez-Roux & Mair, 2010). The efforts of the creators of the COI 2.0 reflect the complexities of neighborhoods and how they may be associated with residents' health and socioeconomic outcomes. A more detailed explanation of their efforts is described in the methods section. The COI also answers the recommendation to use global indexes as indicators of neighborhood dimensions and promotes comparability of findings (Chaix et al., 2009). The COI gathered at the national level reflects childhood opportunities compared to other areas of the nation.

Emerging evidence suggests that the COI is a significant predictor of health outcomes. For example, the overall COI has been utilized in health research examining place effects on childhood health, including cortisol diurnal patterns (Roubinov et al., 2018), asthma hospitalizations (Beck et al., 2017), readmission to pediatric care (Bettenhausen et al., 2021), adolescent cardiometabolic risk (Aris et al., 2021), neighborhood access to food (Ho et al., 2022), and ambulatory care (Krager et al., 2021). In each study, children and youth living in low-opportunity areas had lower access to health-promoting care and exhibited greater health risks. Aligned with previous knowledge of geographical inequities, the COI demonstrates that White and Asian children were more likely to be residing in areas with greater opportunity scores than Hispanic or Black children (Acevedo-Garcia et al., 2020). The COI has not yet been used in studies examining sleep or weight health outcomes. Therefore, the present dissertation examined if COI predicts differences in sleep and weight health among children.

Family-Processes within the Neighborhood

Aligned with the RDS theory, the multi-level bioecological systems model, and the empirical literature reviewed above, there is a need to examine the role of family processes within the investigation of neighborhood effects on children’s health outcomes (Bronfenbrenner & Morris, 2006; Dahl & El-Sheikh, 2007; Holt et al., 2009; Lerner, 2006; Mayne et al., 2021a; Overton, 2013; Scaglioni et al., 2006). The present dissertation focuses on the mediating or moderating role of positive or negative parenting, parental stress and strain, and parental cultural values. The present dissertation draws from three models: the family stress model, the contextual relevance model, and the integrated model (Conger & Conger, 2002; Roche & Leventhal, 2009; White, Roosa,

& Zeiders, 2012). These models examine how family processes moderate or mediate the relationship between environmental context and children or youth well-being. More in-depth reviews of each of the models are presented below. Figure 1 visually represents the proposed pathways.

The Family Stress Model

Among the various challenges of being economically and environmentally disadvantaged, the *family stress model* (FSM) focuses on how these stressors exacerbate child and youth adjustment through parents' psychological distress, parental relationship problems, and disrupted parenting (Conger & Conger, 2002; Masarik & Conger, 2017). The effects of economic hardship on marital instability, parents' mental health, and physical health are documented (Conger et al., 1990; Laxman et al., 2019; Lee et al., 2020). The deleterious effects of economic hardship were experienced at both individual and neighborhood levels (Kingston, 2013; Neff & Karney, 2016). For example, couples living in disadvantaged neighborhoods reported experiencing additional stressors due to social and economic costs associated with living in less advantageous contexts (e.g., low employment opportunities, poor safety, inadequate transportation; Ooms & Wilson, 2004; Trail & Kerney, 2012). These disadvantages that low-income neighborhoods present come at a cost (e.g., emotions, attention, and energy) and may affect one's responsiveness to marital challenges in a constructive manner, thus increasing marital distress (Neff & Karney, 2016). Similarly, researchers noted negative associations between high neighborhood disadvantage with supportive parenting behavior (e.g., warmth, appropriate and consistent discipline; Pinderhughes, Nix, Foster, & Jones, 2001), which may be mediated by the stress and strain parents are feeling within disadvantaged contexts (Kohen et al., 2008; Liu et al., 2009).

The effects of parental stress and strain on children's sleep and weight health are documented. For example, studies found that marital conflict was associated with increased child sleep problems (Bernier et al., 2013; Dubois-Comtois et al., 2019) as well as weight-related behavior or weight indicators (e.g., BMI; George et al., 2017). Furthermore, marital conflict was associated with the child's emotional insecurity about the family and anxiety, which was then related to disordered eating (e.g., restrained eating, emotional eating, external eating; Bi et al., 2017). Another study found a significant association between increased marital conflict with lower quantity and quality of a child's sleep (ages 8 and 9) and greater reports of sleepiness (El-Sheikh et al., 2006) and later sleep disruptions (two-year follow-up; Kelly & El-Sheikh, 2011).

Fathers' parenting stress and marital satisfaction and mothers' perceived social support were related to sleep consolidation in the expected direction among children two years of age while controlling for sleep consolidation at 18 months (Bernier et al., 2013). Other research examining multiple experiences of parental stress found that parents who experienced at least two of four examined stressors (e.g., parental psychological stress, marital strain, lack of social support, and parental worries about their child) had children who experienced higher odds of obesity, cross-sectionally and longitudinally (Koch, Sepa, & Ludvigsson, 2008). Cross-sectional studies examining maternal stress typically found a positive association between maternal stress and a child's overweight status (for review, see Tate, Wood, & Dunton, 2015), but in one study the association was curvilinear (Stenhammar et al., 2010). Although there are significant associations between parental stress and parenting on children's sleep and weight health, it is not clear if this role mediates the association between neighborhood factors and weight health.

The FSM proposes that economic or environmental disadvantages impact children's outcomes via its effects on parents (e.g., parent's psychological health, interparental relationship problems, disrupted parenting). Therefore, the present dissertation examined these sequential processes or the mediating role of parental stress and disrupted parenting between the associations of neighborhood conditions and children's health outcomes. Neighborhood conditions were examined in two different ways (i.e., perceived neighborhood danger, COI) to further elucidate how neighborhood risks (i.e., perceived danger) and varying levels of opportunities in the neighborhood (i.e., low to high opportunities) may be similar or different in conceptualizing neighborhood economic or environmental stressors.

For the present study, a composite of eight different measures (e.g., daily hassles, spouse strain, perceived stress, interpersonal support; Table 2) was created and called parental stress and strain. The eight measures encompass the various constructs of parental and marital stressors discussed in previous studies cited in this section as predictors of their children's wellbeing. A similar composite was used in a previous study (Miadich et al., 2019). Furthermore, the present dissertation adds to the existing literature by addressing two other limitations noted in previous studies. Previous research examining neighborhood effects or parental stress and strain on sleep and weight health predominantly utilizes subjective reports of sleep and BMI and primarily relies on cross sectional approaches (for reviews, see Masarik & Conger, 2017; Mayne et al., 2021a). The present study uses both objective and subjective sleep assessments and objective measure of body fat percentage as recommended by recent reviews and calls for future research (Mayne et al., 2021a; Oliosa et al., 2019). Furthermore, the present dissertation longitudinally examines the relations between neighborhood context and health outcomes (Mayne et al., 2021a).

The Contextual Relevance Model

The *contextual relevance model* (CRM) describes three relationship types between parental processes and contexts to predict youth externalizing behavior: amplified advantages, family compensatory, and amplified disadvantages (Roche & Leventhal, 2009). The *amplified advantages processes* reflect the benefits of effective parenting in low-risk neighborhoods, whereas the benefits of effective parenting in high-risk neighborhoods is described as *family compensatory processes*. The *amplified disadvantages processes* reflect the harm of ineffective parenting for youth living in high-risk neighborhoods (Roche & Leventhal, 2009). For example, parent-child relationship quality was significantly associated with positive behavioral adjustment in early adolescence for children in neighborhoods with low levels of risk, but not for those in high-risk neighborhoods, demonstrating *amplified advantages processes* (Vanderbilt-Adriance & Shaw, 2006). Greater family risk factors (e.g., parental marital strain, parental depressive symptoms, harsh parenting) were associated with later externalizing behaviors and internalizing symptoms for children living in neighborhoods with greater social disorganization, demonstrating *amplified disadvantages process* (Lima et al., 2010).

Although the CRM was proposed to model the moderating effects of neighborhood on the associations between parental influences on youth externalizing, this model can be extended to understanding children and youth health outcomes. Furthermore, the present dissertation focused on the moderating role of family-level variables on the associations between neighborhood contexts and child health outcomes similar to the process investigated in previous studies by Brody and colleagues (2014). For example, the authors examined the moderating role of parental emotional support between the associations of neighborhood poverty contexts and youth allostatic load levels and found that adolescents whose neighborhood poverty contexts increased across adolescence and who received low protective emotional support exhibited the highest allostatic load levels, illustrating *amplified disadvantages processes* (Brody et al., 2014). Furthermore, allostatic load levels did not significantly increase among adolescents who received high emotional support despite increases in neighborhood poverty, illustrating *family compensatory processes* (Brody et al., 2014). In another study, positive parenting was protective of children's cortisol reactivity, especially for families experiencing greater poverty (*family compensatory processes;* Brown et al., 2021). A study examining the roles of parental support and family stress on adolescent sleep concluded that in contexts of greater family stress, greater parental support was associated with longer sleep duration, less sleep variability, and less time spent awake during the night for youths, modeling *family compensatory processes* (Tsai et al., 2018). There may be empirical reasons to continue applying the CRM to examine the moderating role of parenting when examining the associations between environmental conditions and children's sleep and weight health outcomes.

Traditionally, CRM focuses on the moderating effects of disadvantaged neighborhoods between the associations of family-level variables and child and youth outcomes. In addition to examining the role of perceived neighborhood danger, the present dissertation also incorporated neighborhood opportunities (i.e., COI). This strength-based approach adds to the existing literature and the CRM by noting the possible benefits of living in advantageous neighborhoods. Furthermore, the COI is a new measure so research is scant on how proximal processes (e.g., family) attenuate or strengthen its effects on children and youth health. In the present dissertation, positive and negative parenting were examined as moderators of the associations between neighborhood conditions (i.e., perceived danger, childhood opportunities) and sleep and weight health. Positive parenting is defined as loving, understanding, reasonable, protective, and presenting opportunities (Kulkarni, 2010). Positive parenting is an approach that is sensitive to children's individual needs and well-being through mutual respect, facilitation of developmental opportunities, and the constructive negotiation of parent and child's diverging interests (Daphne, 2009). Examples of positive parenting are praising good behavior, setting clear rules, taking time to listen, working as a team, and using positive disciplining instead of physical punishment (Daphne, 2009). Positive parenting within disadvantaged neighborhoods has been associated with youth brain development (Whittle et al., 2017) and children and youth's psychosocial adjustment (for review, see Cuellar, Jones, & Sterrett, 2015). Whereas negative parenting is characterized as authoritarian control, abusive parenting, and lack of warmth (Gölcük & Berument, 2021; Smokowski et al., 2015). Negative parenting practices include physical punishment, inconsistent discipline, emotional maltreatment, neglect, coercion, and harsh parenting (Gershoff, 2010; Iwaniec et al., 2007; Lotto, Altafim, & Linharres, 2012). Negative parenting may be detrimental to children and youth well-being (e.g., internalizing problems, externalizing behaviors, brain development; Dallaire et al.,2006; Morris et al., 2004; Seay et al., 2014; Whittle et al., 2016).

Few studies have examined the role of positive parenting on children's sleep across distinct developmental stages using objective measures of sleep. Among the existing studies that examined positive parenting on sleep, most have examined the association among infant samples (for reviews, see Sadeh, Tikotzky, & Scher, 2010; Tikotzky, 2017). Studies examining school-aged children have examined the association between positive parent-child interactions on concurrent and later sleep (Cimon-Paquet, Tetreault, & Bernier, 2019; Bordeleau, Bernier, & Carrier, 2012). One study found that positive mother-child interaction at 18-months old predicted greater sleep duration at seven years of age but did not significantly predict sleep efficiency (Cimon-Paquet, Tetreault, & Bernier, 2019). Some evidence suggests significant negative associations between negative parenting and children's sleep. One study that looked at the association among children ages 6 – 12 years old found a significant negative association between coercive parenting, an example of negative parenting, on children's average sleep duration (Philips et al., 2014). Negative parenting predicted poor sleep for children when they were eight years old, and poorer sleep reported at age eight predicted negative parenting characteristics when the children were eleven years old (Bell & Belsky, 2010).

Studies examining associations between parent-related dimensions and child weight health typically have examined parent-child relationships, qualities of parenting, and parenting styles. Among the various assessments, parenting style was most consistent in predicting child BMI (Shloim et al., 2015). Authoritative parenting significantly predicted lower BMI (Berge et al., 2010; Sleddens et al., 2011; Rodenburg et al., 2013) and negligent or permissive parenting were linked with increased risk of higher BMI (Olvera and Power, 2010). Authoritarian parenting during early childhood was associated with increased risk for being overweight during middle childhood (Rhee et al., 2006). However, the impact of the parenting styles on children's weight health were not always significant, especially among studies that examined the relationship with a sample of children of different ethnic and cultural backgrounds (Park & Walton-Moss, 2012). For example, authoritative parenting which predicts healthy weight in most literature was not always supported among a sample of Native American families (Rutledge et al., 2019). In this study, children with mothers who reported high on autonomy granting (subscale of authoritative parenting) predicted lower weight status similar (Rutledge et al., 2019), but the association was not significant among mothers who reported low or average autonomy granting parenting style. Whereas the weight status of European American children was predicted by all levels (i.e., low, average, and high) of their mother's autonomy granting parenting style (Rutledge et al., 2019). As for the impact of parent-child interactions on children's weight health, some studies note how promoting positive parent-child interactions may promote weight health among children (for review, see Skouteris et al., 2012). Results from an intervention highlighted the importance of positive-parent child interactions during feeding and sleep times during early childhood to promote later weight health (March et al., 2019).

Drawing from existing research, the present dissertation takes an innovative approach to examining positive and negative parenting using the CRM framework to examine their potential moderating roles on the links between environmental contexts and children's health. First, the moderating role of positive parenting on associations between perceived danger and children's health outcomes were examined to test *amplified advantages processes* and *family compensatory* processes. Negative parenting was next be examined as a moderator of the relations between perceived danger and children's health outcomes to test *amplified disadvantages processes*. Next, the moderating role of positive parenting was examined on associations between COI and children's health outcomes to test *amplified advantages processes* and *family compensatory processes*. Negative parenting was examined as a moderating variable on the relations between COI and children's health outcomes to test *amplified disadvantages processes*. Lastly, noting the risks associated with parental stress and strain on health outcomes (noted in the FSM section of the introduction) and the benefits of positive parenting (noted in this section), the present dissertation examined if positive parenting moderates the relations between parental stress and strain and health outcomes, demonstrating a form of *family compensatory processes*.

The Integrated Model

The *integrated model* extends the family stress model by integrating the moderating role of parents' cultural values between environmental stressors and parental functioning (White, Roosa, & Zeiders, 2012). Familism is a strong cultural value within Latino communities, which is portrayed through a sense of responsibility, loyalty, and solidarity among family members (Sabogal, Marin, Otero-Sabogal, Marin, & Perez-Stable, 1987). Greater familism values have been associated with positive health outcomes such as mental health (for review see, Valdivieso-Mora et al., 2016) and physical health (for review, see Perez & Cruess, 2010) among Latino/Hispanic samples. Although the familism scale was created to represent the cultural values of Latino families, some suggest the applicability of familism across diverse ethnic groups (Schwartz, 2010).

Studies examining the moderating role of familism on associations between neighborhood contexts and family functioning (e.g., warm/harsh parenting, parental mental health) shed light onto how cultural values may influence how parents respond to perceived contextual threats (e.g., neighborhood danger; Halgunseth et al., 2006). For example, research suggests that Mexican fathers with greater levels of familism values and perceives their neighborhoods to be on the higher level of danger self-reported greater levels of harshness than fathers with average or low levels of familism (White, Roosa, & Zeiders, 2012). This longitudinal study later found that Mexican mothers who expressed feeling higher economic pressure and lower levels of familism were more likely to self-report lower maternal warmth, than mothers with greater levels of familism (White et al., 2015). Interestingly, neighborhood danger was positively associated with harsh parenting, as reported by their teens, among mothers with higher familism values (White et al., 2015; White et al., 2019). The association between neighborhood danger and harsh parenting was negative or not significantly associated among mothers with lower familism values (White et al., 2015; White et al., 2019).

Similarly, another study examined the possible protective role of familism within at-risk contexts (e.g., neighborhood disorder, poorer living conditions) and found no significant interactive effects between neighborhood disorder and familism on Filipino parent's paternal warmth and paternal rejection (Jocson, 2020). However, familism significantly moderated the association between poor living conditions and paternal rejection such that among Filipino fathers who reported high or mean levels of familism, poor living conditions significantly predicted paternal rejection of their child (Jocson, 2020). The results of this study suggest the possible limits of the protective role in high risk living conditions such that as living conditions become poorer, the protective function of familism on rejection is diminished. These findings may suggest how economically strained families living in higher risk contexts are responding to the challenges by adapting how they parent to the conditions while remaining consistent with their cultural values.

The diminishing protective effect of familism on parental functioning in high-risk context is curious and warrants further examination. Therefore, the present study explored if parents' endorsement of familism values moderates the association between perceived neighborhood danger and the parental stress and strain. Furthermore, familism was skewed negatively (i.e., many participants reported high familism values) in many of the studies cited above. There is a need to examine a sample that represents greater variability in endorsement of familism cultural values. Perhaps the heterogeneous sampling, which may represent a wider distribution of the familism cultural values, may shed a different light on the existing knowledge.

The Current Study

Drawing from relational developmental systems theory (Lerner, 2006; Overton, 2013), the present dissertation examined the direct effects of subjective and objective assessment of the neighborhood assessed at age 8 on children's sleep and weight health at age 10, controlling for the sleep and weight health at age 8 using the Arizona Twin Project, an on-going longitudinal study of twins in the states of Arizona. For aim 1a, it was hypothesized that greater parental perceptions of danger in the neighborhood would significantly predict lower weight health (Timperio et al., 2004), shorter sleep duration, lower sleep efficiency, and greater sleep problems (Mayne et al., 2021a). For aim 1b, it was hypothesized that greater COI would significantly predict better weight health (Coughenour, Coker, & Bungum, 2014), lengthier sleep duration (Pabayo et al., 2014; Ruff et al., 2018), greater sleep efficiency (Mayne et al., 2021a), and lower sleep problems (Singh & Kenney, 2013).

Next, drawing from the FSM (Conger & Conger, 2002), the present dissertation examined if parental stress and strain (age 8) and negative parenting (age 8) serially mediates the associations between neighborhood conditions (age 8; i.e., perceived neighborhood danger and COI) and sleep and weight health (age 10; Masarik & Conger, 2017). In addition, the mediating role of parental stress and strain (age 8) between COI (age 8) and later sleep and weight health (age 10) were examined (Masarik & Conger, 2017). For aim 2a, it was hypothesized that greater parental stress and strain and negative parenting would serially mediate the association between greater perceived neighborhood danger and shorter sleep duration, lower sleep efficiency, greater sleep problems, and higher body fat percentage (Mayne et al., 2021a; Oliosa et al., 2019). For aim 2b, it was hypothesized that lower parental stress and strain negative parenting would serially mediate the association between greater COIs and higher sleep duration, better sleep efficiency, lower sleep problems, and lower body fat percentage (Mayne et al., 2021a; Oliosa et al., 2019).

Third, the moderating role of positive parenting between neighborhood contexts and children's health outcome to test *amplified advantages processes* and *family compensatory processes* were examined (CRM; Roche & Leventhal, 2009). For aim 3a, it was hypothesized that the negative association between neighborhood danger and greater health outcomes would be attenuated for children who experience greater positive parenting, as compared to children who experience less positive parenting, reflecting *family compensatory processes* (Brody et al., 2014). For aim 3b, it was hypothesized that that the positive association between neighborhood opportunities and better sleep and weight health outcomes would be strengthened through positive parenting, as compared to children who experience less positive parenting. Importantly, in aims 3a and 3b, it was also hypothesized that positive parenting would have a direct and positive effect on children's health outcomes (Roche & Leventhal, 2009).

Next, the moderating role of negative parenting between neighborhood contexts and children's health outcomes were examined. For aim 3c, it was hypothesized that the negative association between greater perceived neighborhood danger and poorer child sleep and weight health outcomes would be strengthened (or worse) for children who experience greater negative parenting, as compared to children who experience less negative parenting, reflecting the *amplified disadvantages processes* (Brody et al., 2014). For aim 3d, it was hypothesized that the positive association between neighborhood opportunities and child sleep and weight health would be attenuated for children who experience greater negative parenting, as compared to children who experience less negative parenting, a relationship not described in the CRM. An exploratory examination of the moderated-mediation models which tests the broader FSM and CRM was tested. As these were exploratory analyses, hypotheses were not provided.

Lastly, I explored the potential moderating effects of parents' familism values on links between subjective reports of neighborhood contexts or COI and parental stress and strain (path *1bz*; path *2bz*; Figure 1*;* White, Roosa, & Zeiders, 2012). For aim 4a, it was hypothesized that greater endorsement of familism values would buffer the risks associated with greater perceptions of neighborhood danger on increased parental stress and strain (Jocson, 2020). For aim 4b, it was hypothesized that greater endorsement of familism values would amplify the negative links between COI and parental stress and strain (Jocson, 2020). In an exploratory manner, I also examined whether familism moderated the mediation pathways testing the broader FSM and integrated model.

CHAPTER 2

METHOD

Participants

The participants were drawn from the Arizona Twin Project, an ongoing longitudinal study of a large demographically diverse sample of twins (Lemery-Chalfant et al., 2019). Families were recruited at approximately 12 months old using Arizona birth records. The current analytic sample include those that participated at 8 years of age and at 10 years of age. A total of 933 participants were represented in the study with full or partial data. There were 703 participants that participated at the age 8 wave and 550 (78.2%) continued to participate at the age 10 wave. Two-hundred-thirty additional participants were newly recruited at age 9 (assessments not included in this study) and the age 10 wave. A detailed breakdown of the participants' twin status, sex, race and ethnicity, parent education, and income-to-needs ratio as reported by the primary caregivers is in Table 1.

Out of the 703 participants that participated at the age 8 wave, 587 (83.5%) completed home visits, 84 (11.9%) participated out-of-state, 28 (4.0%) participated with surveys only, and 4 (0.6%) declined or aged out but have some data (e.g., teacher surveys). Out of the 780 participants that participated at the age 10 wave, 510 (65.9%) completed in-person home visits, 96 (12.4%) completed virtual home visits due to the COVID-19 pandemic, 96 (12.4%) participated out-of-state with surveys only, 72 (9.3%) were in state and participated with surveys only, and 6 (0.8%) are missing data. Ten individuals were excluded from analyses due to physical or cognitive disabilities (e.g., Down Syndrome, Autism). No other exclusions were made based on extreme scores or missing data. Attrition analyses were conducted to examine if there are any significant differences between those who participated at both age 8 and the age 10 wave and those who only participated at the age 10 wave on any demographic (i.e., gender, race/ethnicity, socioeconomic status [SES]) and outcome parameters.

Procedure

Institutional Review Board approval was obtained for all procedures at both waves of data collection prior to the start of the study. Informed consent and child assent were obtained before each wave of assessment. Families were compensated for all components of the study. At the age 8 wave, families were offered the opportunity to participate in an intensive study of sleep and health which included two home visits (approximately 1 week apart), a study week between the two home visits, and online or paper interviews with primary caregivers and secondary caregivers. Before the first home visit, primary caregivers completed the first survey with demographic questions online. During the first home visit, two trained project staff obtained informed consent from parents and verbal assent from twins, and they trained primary caregivers on study-week procedures. During the study week, the twins wore actigraph watches on their nondominant wrists for 7 consecutive days (removed only for bathing and swimming), and primary caregivers completed an assessment table recording twins' bedtimes and wake times to validate actigraph data. Project staff contacted primary caregivers daily to answer questions and ensure that study protocol was being followed. During the second home visit, study materials were collected, and primary caregivers completed an in-home paper survey asking about the neighborhood environment, familism, child's sleep problem, and parental stressors. In addition, two different interaction tasks between the parent and each twin were recorded during the second home visit. Finally, primary caregivers completed a third online survey primarily regarding the parent's health status.

The age 10 assessment occurred between 2019 - 2020, therefore two different procedures were applied to safely continue the assessments during COVID-19 pandemic. Before March 16, 2020, primary caregivers were sent an online survey before the first home visit. During the first home visit, two trained project staff obtained informed consent from parents and verbal assent from twins, and they trained primary caregivers on study-week procedures. After March 16, 2020, primary caregivers were sent the online survey and a study packet was mailed to them. The home visit was conducted virtually or over the phone during this time. There were 620 twins that participated before March 16, 2020 (79.49%) and there were 160 seen after March 16, 2020 (20.5%). Procedurally, the training was the same for in-person and online. During the study week, every twin that agreed to provide objective sleep data wore actigraph watches on their nondominant wrists for 7 consecutive days (removed only for bathing and swimming), and primary caregivers completed an assessment table recording twins' bedtimes and wake times to validate actigraph data. Project staff contacted primary caregivers daily to answer questions and ensure that study protocol was being followed. For home visit two, trained research assistants retrieved the study materials and paid the participants. During the pandemic all procedures were completed at a safe distance as recommended by the Center for Disease Control.

Measures

Sleep Duration and Efficiency. At the age 8 wave and the age 10 wave, participants wore a Micro Motion Logger Watch (Ambulatory Monitoring, Inc. Ardsley, NY USA) on their non-dominant wrist for seven consecutive nights. These devices were set to run in zero-crossing mode with a data storage epoch length of 60 seconds. This actiwatch contains an accelerometer, which captures movement throughout the waking day and during sleep periods. Collection of reliable objective sleep data may be challenging due to varying reasons such as illness, technical difficulties, and participant noncompliance. Therefore, the present study followed the guidelines suggested by Acebo and her colleagues (1999) to record at least 1 full week of actigraphy data, aiming to collect at least 5 nights of analyzable data to obtain reliable measures of sleep. Furthermore, the objective data were cross-validated by primary-caregiver report of bed and wake times on a sleep-assessment table. Parents recorded the time their children went to bed, and this parent report of bedtime was used in conjunction with actigraph-detected ambient light in the room and physical activity to determine the time when children first attempted to sleep and first fell asleep. Once the data was retrieved from the watches, the sleep data were scored using the Sadeh algorithm (Sadeh, Hauri, Kripke, & Lavie, 1995; Sadeh et al., 1994) in Action W-2 software version 2.7.1 (Ambulatory Monitoring, Inc.) program.

Considering recommendations to include multiple objective sleep parameters in a study (Gregory & Sadeh, 2012) paired with empirical review of place effects on objective sleep (Mayne et al., 2021a), we used the following parameters: duration and efficiency. Sleep duration is defined as the total time spent asleep between the period of first sleep onset to sleep offset, excluding all bouts of waking and latency prior to first onset. Sleep efficiency is the ratio of time spent asleep to total time in bed, with total time in bed including true sleep, bouts of waking, and latency prior to first sleep onset. Data for each sleep parameter was averaged across the week assessment for analyses. Day-level sleep parameters were winsorized to 3 standard deviations outside the mean prior to analysis.

During the age 8 wave, there were full missing data for 32 twins (8.4% of eligible twins) and at the age 10 wave there were full missing data for 62 (11.5% of eligible) twins because of mechanical failure, a lost or submerged watch, or refusal to wear the watch but continuing to participate in other study procedures. During the age 8 wave, there was excellent compliance with study procedures among children without full missing sleep data: 459 (85.5%) children completed seven or more nights of actigraphy (3% chose to wear the watch more than 7 nights), 54 (10.1%) children completed six, seven (1.3%) children completed five, 11 (2.0%) children completed four, and six (1.1%) children completed three. During the age 10 wave, 393 (76.0%) children completed seven or more nights of actigraphy, 71 (13.7%) had six nights, 26 (5.0%) had five nights, 14 had four nights (2.7%), and 13 (2.5%) had three nights. Previous research suggests actigraphy assessments include an average of at least five nights of sleep; the present dissertation analyzed the aims of the study with participants with five-plus days of sleep data and compare if the results differ if we include participants with three or more nights of sleep.

Sleep Problems. The Child Sleep Habits Questionnaire (CSHQ; Owens et al., 2000a) is a 35-item parent report measure of children's sleep behaviors, intended for children ages 4 - 10 years old. Rather than the 3-point Likert scale of the original measure, we used a modified version with items rated on a 5-point Likert scale where 1 = Never (0 times per week), 2 = Rarely (1-2 times per week), 3 = Sometimes (3-4 times per week), 4 = Usually (5-6 times per week), and 5 = Always (7 times per week). The CSHQ assesses seven domains of sleep: bedtime resistance, sleep onset delay, nighttime wakings, sleep anxiety, parasomnias, sleep disordered breathing, and daytime sleepiness (Owens et al., 2000a). Sample items are "Twin A is restless and moves a lot during their sleep" (parasomnias), "Twin A struggles at bedtime" (bedtime resistance), and "Twin A wakes up more than once during the night" (nighttime wakings). A total sleep disturbance score was calculated by taking the mean of all items across all seven subscales, with higher scores indicating more sleep problems (the age 8 wave $\alpha = .80$, the age 10 wave $\alpha = .80$). The CSHQ has demonstrated reliability and validity in other samples (Owens et al., 2000a, Owens et al., 2000b).

Weight Health. Percent body fat is characterized as the ratio of body fat to total body weight (percentage). In this study, the percent body fat was objectively gathered during the home visits using the Tanita Child Scale (Nystrom et al., 2016), which is a bioelectrical impedance (BIA) device that measures fat mass, fat free mass, and body fatness. The BIA is the gold-standard in measuring body fat (Kettaneh et al., 2005). During the age 8 wave, percent body fat was assessed up to three times per home visit (six possible total measures), and up to three times during the age 10 wave (missing during pandemic procedures; $N = 160$). Percent body fat estimates were averaged across or within visits to provide a single percent body fat score for each twin at each time point.

Perceived Neighborhood Danger. The Neighborhood Danger Scale is a 3-item measure of neighborhood safety modified from the Sense of Safety subscale of the Neighborhood Quality Evaluation Scale (Kim et al., 2009; Roosa et al., 2005). Specifically, one item from the NQES was not used ("I do not feel safe walking to the school, park, or store in this neighborhood"). At the age 8 wave, the primary caregiver was asked to consider how much the following statements were true about their neighborhood: 1) "your neighborhood is safe for children during the daytime", 2) "it is safe in your neighborhood", and 3) "it is safe for your child to play outside your home". The 3-item version has been used successfully in past research (White et al., 2009), and has a high reliability ($\alpha = .93$). The original 1-4 scale was changed to a 5-point scale where 1 = not at all true, 2 = a little true, 3 = somewhat true, 4 = mostly true, and 5 = very true. Scores were reverse scored so that higher scores regard higher perceived danger ($M = 1.47$, $SD = .70$; range 1.00 - 5.00).

The Child Opportunity Index. The Child Opportunities Index (COI) is a composite of 29 objective indicators of neighborhood resources, coded from numerous sources (e.g., U.S. Census Bureau American Community Survey, National Center for Health Statistics, Department of Education, U.S. Environmental Protection Agency) and spanning three broad domains: 1) educational opportunity, 2) health and environmental opportunity, and 3) social and economic opportunity. The indicators were representative of contemporary features of neighborhoods that existing literature has identified as neighborhood dimensions that are affecting children (Noelke et al., 2020). The 2015 census tract-level (i.e., an area covering about 4,000 residents) was used to define neighborhoods for this index. There were 300 different tracts represented in the age 8 wave; eight participants were missing address data. There was a range of 1 to 6 households that were living in each tract level (288 tracts with 1 family, 44 tracts with 2 families, 14 tracts with 3 families, 1 tract with 4 families, 1 tract with 6 families). To combine the 29 indicators measured in different scales into an index, the raw values of each indicator were standardized and given weights that reflect the strength of the association between each indicator and related health and socio-economic outcomes (Noelke et al., 2020). Data is available to compare child opportunities at the federal, state, and metro/local levels; the present dissertation used the opportunity index created to compare children's opportunity at the federal level since participants resided in multiple states.

The child opportunity index categorizes child opportunities into five categories: "1 - very low", "2 - low", "3 - moderate", "4 - high", and "5 - very high". Each of these categories were calculated based on the 2015 distributions of the overall index weighted by the child population within the area. This means that exactly 20% of the U.S. child population is represented in each of the classifications of opportunity. Specifically, census tracts with scores at or below the 2015 20th percentile were given a score of "1, which represents a "very low" opportunity ($N = 72$). Tracts above the 20th percentile and at or below the 40th 2015 percentile were classified as "2 - low" opportunities ($N = 132$). Tracts above the 40th percentile and at or below the 60th 2015 percentile were classified as "3 - moderate" opportunities ($N = 117$). Tracts above the 60th percentile and at or below the 80th 2015 percentile were classified as “4 -high” opportunities (*N* = 160). Tracts with scores at or above the 2015 80th percentile were given a score of “5”, which represents a “very high” opportunity (*N* = 214). There were five households with missing addresses. The average COI score for this sample was *M* = 3.45 (*SD* = 1.37).

Parental Stress and Strain Composite. Eight measures reported by the primary caregiver were combined to create the parental stress and strain (PSS) composite: parenting daily hassles (Crnic & Greenberg, 1990), partner stress and general stress (Cohen et al., 1983; Whalen & Lachman, 2000), low interpersonal support (Cohen et al., 1985), chaos in the home (Matheny et al., 1995), and the primary caregiver’s mental health symptoms (Lovibond & Lovibond, 1995; Radloff, 1977; Table 2). PSS, a latent factor, was composited through confirmatory factor analyses. The Spouse/Partner Strain Scale was missing not-at-random since not all responding parent had partners at the time of the response (82.4% married or in a partnership, 17.6% separated, divorced, widowed, always single, other). However, the missing values were replaced using the full information maximum likelihood estimation method (Enders, 2013). There was a mediocre fair model fit (CFI = .89, TLI = .85, SRMR = .06, RMSEA = .12). Each of the measures that were loaded were all greater than .4, which indicates stability in the term loadings (parenting daily hassles = .50, partner strain = .86, Perceived Stress Scale = .68, chaos in the home = .78, depressive symptoms = .55, anxiety symptoms = .50, stress = .70, inverse of interpersonal support = .55; Guadagnoli & Velicer, 1988). Full information on the measures in the PSS composite is in Table 2.

Parenting. The Parent-Child Discussion task (Eyberg & Robinson, 1981) and the Parent-Child Teaching task (Rubin et al., 2010) were observed and recorded at the age 8 wave and during a home visit. Each of the tasks were completed by the primary caregiver and each twin, separately. The purpose of the Parent-Child Discussion task was to assess the quality of parent-child interaction during a dyadic discussion of both good times and bad times that the parent and child nominate. At the beginning of the home visit, the primary caregiver was asked to recall three bad times when they had an argument or a problem with each of the twins within the recent months and indicated which of the conflicts were the worst. Then the primary caregiver was asked to recall three good times when they had a positive interaction with each of the twins within the recent months and indicated which of the three examples represented the best time. Later in the home visit, the primary caregiver and *each* twin were asked to discuss the worst problem and asked to work on a resolution or solution for 7.5 minutes. Next, the researcher came in and asked the pair to discuss the good times for another 7.5 minutes. These interactions were recorded using two cameras, one to record the parent and the other for the child.

As for the Parent-Child Teaching task, a trained research assistant presented the primary caregiver and child with pieces of a novel construction toy ("Zoobs") and a photo of a building made out of the Zoob pieces. The primary caregiver and the child are asked to recreate the building in the photo with the Zoob pieces within 15 minutes. The parent and child were told that they would be evaluated based on how quickly they completed the task and the accuracy of the final product in comparison to the building in the photo. The research assistant did not help, in fact, they left the room but remained close by with the 15-minute timer. If the dyad were able to finish before the 15 minutes was up, they were given a second photo of a different building. If they completed the second task, within the original 15 minutes, they were given the rest of the time to play freely with the Zoobs. If the pair were not able to complete the first task within the allocated 15 minutes, they were given praise and the task ended.

The interaction tasks between the parent and child were recorded using two cameras to record the parent and child simultaneously. Each of the parent video videos were hand coded by trained research assistants for positive and negative parenting. The presence of positive or negative parenting was coded as 1 and the absence of positive parenting was coded as 0 over 10-second epochs. Both positive and negative parenting behaviors could have been coded within a single 10 second epoch, but single verbalization and behavior could only be coded as either positive or negative parenting, not both. Ten percent of all episodes were double coded by a master coder and all coders reached greater than 90% agreement. Positive parenting domains include encouragement, descriptive comments and questions, praise, reflective statements and questions, facilitation of the conversation, positive physical contact, sensitivity, terms of endearment, agreements with the child, and other miscellaneous positive displays. Negative parenting domains include negative physical contact (e.g., inflicting pain), intrusion into child's space, critical statements or questions, negative commands, warning, withdrawal of attention, and diminishment of child autonomy. Scores from each epoch for the entire task were averaged to calculate the frequency of positive and negative parenting. Higher scores represent more positive or negative parenting (N=567, $M_{positive}$ = .36, *SD* = .12; $M_{negative}$ = .12, *SD* = .09).

Familism Cultural Values. Familism cultural values were assessed using the Mexican American Cultural Value Scale (MACVS; Knight, Gonzales, Saenz, Bonds, German, Deardorff, Roosa, & Updegraff, 2010), a 50-item self-report measure assessing

Mexican American and Mainstream cultural values on a Likert scale ranging from 1 (*not at all*) to 5 (*completely*). In this study, all primary caregivers in the sample were asked to complete the MACVS, whether they identified as Mexican American or not (Schwartz, 2010). The total familism values scale ($N = 644$, $M = 3.77$, $SD = .54$; $\alpha = .87$) is a mean composite of familism support (6-items, e.g., "It is always important to be united as a family"), obligation (5-items, e.g., "Older kids should take care of and be role models for their younger brothers and sisters"), and referent (5-items, e.g., "It is important to work hard and do one's best because this work reflects on the family"). The composite reflects the primary caregiver's familism cultural values.

Covariates. Primary caregivers completed surveys that covered demographic information at the age 8 wave and the age 10 wave (Table 1). Twin specific covariates included: sex (0 = male, 1 = female). Family level covariates included: European descent, Latino descent, vacation status (0 = study week took place during the school year, 1 = study week took place during holiday or summer vacation), pandemic status (0 = the age 10 wave assessment before March 16, 2020, 1 = the age 10 wave assessment after March 16, 2020), and SES (standardized mean composite of family income-to-needs ratio, primary- and secondary- caregiver's education reported at the age 10 wave). The family income to needs ratio was calculated based on the guidance of the U.S. Census Bureau (2022): total family income was divided by the poverty threshold established annually by the Census Bureau (2017 for the age 8 wave, 2019 for the age 10 wave). Families who were considered as living in poverty if they received a score of less than 1, near the poverty line if scored 1 – 2, lower middle class if scored 2-3, and middle to upper class if scored above a 3 (Table 1).

Analytic Plan

Bayesian estimation. Multilevel mediation models were used to adjust for the nesting of twins within families (Preacher et al., 2011). Level 2 predictors (i.e., family-level) were grand mean centered, Level 1 predictors (i.e., individual-level) were individual mean centered, and when simple slopes were examined the Level 1 predictors were group mean centered (Bauer & Curran, 2005). Each of the models were fit separately for each health outcome: sleep duration, sleep efficiency, sleep problems, and body fat percentage. All analyses were conducted in Mplus 8.0 (Muthén & Muthén, 1998-2017) using the Bayesian estimation approach (Asparouhov & Muthén, 2021).

The Bayesian estimation approach is presently noted as conceptually simpler to use for multilevel analysis compared to the maximum likelihood approach or the frequentist approach (Yuan & MacKinnon, 2009, p. 301). One of the conditions of the Bayesian approach is that the true model parameter as unknown and thus treats it as a random variable that has a probability distribution (i.e., posterior distribution; Prati, Pietrantoni, & Albanesi, 2017, p. 6), unlike the maximum likelihood estimation. The Bayesian mediation analysis can construct credible intervals for indirect effects for complex mediation models in a straightforward manner which is necessary to test the family stress model (Gelman & Hill, 2007; Yuan & MacKinnon, 2009). Furthermore, Bayesian estimates do not impose restrictive normality assumptions on sampling distributions of estimates (Robert, 2007), which addresses previous concerns of non-normal sampling distributions when testing indirect effects using the common Sobel Product of Coefficients Approach (MacKinnon & Dwyer, 1993, Stone & Sobel, 1990).

To the present dissertation's benefit, multilevel moderation analyses can also be estimated with the Bayesian estimation method (Zyphur et al., 2019). In fact, Bayesian estimators resolve some the limitations of the maximum likelihood (ML) estimation method (i.e., in the cases where the interactions between a latent variable and observed variable is estimated; Asparouhov & Muthén, 2020). Lastly, using the Bayes estimation improves convergence rate and reduce the sample size requirement when simulations become harsher (i.e., more complicated) compared to ML-based estimations (Zitzmann et al., 2016), thus providing the opportunity to test the multilevel moderated-mediation model (Jedidi & Ansari, 2001; Kim & Hong, 2020).

Computationally, the Markov chain Monte Carlo (MCMC) methods provide a tool that allows researchers to fit almost any complex multilevel model, unlike the conventional multilevel mediation analysis (Kenny, Korchmaros, & Bolger, 2003). The main criterion used in Mplus to determine convergence of the Markov Chain Monte Carlo (MCMC) sequence is the potential scale reduction (PSR). In all the estimated models, PSR was confirmed to be below 1.05 as recommended (Asparouhov & Muthén, 2010, p. 8). To interpret significant findings when using the Bayesian estimation approach, the Bayesian 95% credibility interval (CI) was examined such that if the estimates do not include zero, the significance of the parameters at the .05 level is supported (Asparouhov & Muthén, 2010, p. 7).

Preliminary analyses. Descriptive statistics were reviewed for all study variables, including means, ranges, standard deviations, and estimates of skewness and kurtosis for both the age 8 wave and the age 10 wave. Normality of the variable distributions were visually represented graphically in SPSS. The descriptive statistics and visual inspection of the data aided in the identification of outlier cases that may have undue influence on the trends of the data. Any extreme values were further investigated. Sample *t*-tests were conducted to examine if there is a significant mean difference between health outcomes reported at the age 8 wave and the age 10 wave. One-way analysis of variance was conducted to examine if there were significant demographic differences (i.e., gender, SES, European descent, Latino descent) between children who participated at both time points ($N = 550$) compared to those who only participated during the age 8 wave ($N = 153$) and the age 10 wave ($N = 230$). After decisions were made whether to include outlier cases, bivariate zero-order correlations were used to examine the relationship between the variables of interest. In addition, bivariate correlations between covariates and the independent variables and dependent variables of interest were examined. Non-significant covariances were omitted to increase degrees of freedom. All analyses controlled for gender, SES, European descent, Latino descent, vacation status, and pandemic status. Measurement invariance testing for familism was also conducted to compare if item responses varied between Latino descent and European descent.

Aim 1 direct effects. The first aim tested the direct associations between neighborhood dimensions (e.g., parent perceived neighborhood danger, COI) and changes in sleep duration, sleep efficiency, sleep problems, and weight health from the age 8 wave to the age 10 wave (detrending approach; Wang & Maxwell; 2015; paths 1*a* and 2*a*, Figure 1). Detrending refers to the statical operation of controlling for the effect of time while examining the relation between two variables (Wang & Maxwell; 2015). There are multiple possible detrending options (e.g., detrending only the predictor, detrending only the outcome, detrending both; Wang & Maxwell; 2015). It was determined that the outcome, the time varying variable, needed to be detrended for this dissertation. Therefore, sleep and weight outcomes at age 8 will be included as a covariate in the first level (individual level) as modeled in Curran et al. (2012) and Hoffman and Stawski's (2009) paper. All covariates were included in the models.

Aim 2 multilevel mediation analysis. The second aim, which tests the family stress model, was examined using a series of multilevel mediation models. First, the first-order mediation of PSS was tested (path 1*be* and 2*be*, Figure 1). The purpose of this step was to examine whether PSS mediated the relationship between neighborhood conditions and health outcomes, and to ascertain whether the indirect effect leading from neighborhood effects to health outcomes through PSS is statistically significant. Next, if there was a significant mediation, *negative* parenting was added into the model to fully test the pathway described in the family stress model (path 1*bcd* and 2*bcd*, Figure 1). The second-order mediation or double mediation was tested by including *negative* parenting as the second mediator. The statistical significance of the indirect effects was determined by using the 95% credible intervals (Asparouhov & Muthén, 2010; Yuan & MacKinnon, 2009). If the 95% credible interval does not include zero, the path is statistically significant.

Aim 3 and 4 multilevel moderation analyses. The analysis to test aims 3a – 3d included an examination of the moderating role of *positive* and *negative* parenting on associations between neighborhood effects and health (path 1*ax,* 2*ax,* 1*ay,* 2*ay*, Figure 1). Furthermore, analyses to test aims 4a and 4b examined the moderating role of familism on the associations between neighborhood contexts and PSS (path 1*bz,* 2*bz*, Figure 1).

Multilevel moderation was used to examine all aims. For aims 3a – 3d, random slopes were estimated to test the cross-level interaction, as positive or negative parenting were measured at the individual level and the neighborhood statuses were measured at the family level (Zyphur, Kaplan, & Christian, 2008). Significant interactions were interpreted using the Johnson-Neyman techniques (Carden et al., 2017). The Johnson Neyman (J-N) technique was used to probe significant interactions to determine for which range of values of the moderator the focal predictor is significantly related to the outcomes (Preacher, Curran & Bauer, 2006).

Aim 3 and 4 multilevel moderated mediation analyses. Furthermore, exploratory analyses combining the three frameworks were conducted using multilevel moderated mediation approaches (Zyphur, Zhang, Preacher, & Bird, 2019). There were two different types of moderated-mediation analysis required for this study: the first stage and the second stage (Edwards & Lambert, 2007). The first stage moderated mediation is conducted to test if the mediating process that links an independent variable to an outcome variable varies due to the moderating variable either strengthens or attenuates the relationship between the independent variable and the mediator (Edwards & Lambert, 2007). The second stage moderated mediation is conducted to test if the indirect effect of the independent variable to the dependent variable via the mediator changes (i.e., increased, decreased) based on the effect of the value of the moderator (Edwards & Lambert, 2007). Aims 3e (path 1*bwe*) and 3f (path 2*bwe*) which examined if the effect of neighborhood conditions on health outcomes via the mediating role of PSS varied based on the level of positive parenting required the second stage moderated mediation analysis. Aims 4c (path 1*bze*) and 4d (path 2*bze*) explored if the mediating role of PSS between neighborhood contexts and health outcomes varies based on the moderating role of familism, using the first stage moderation-mediation analysis (Edwards & Lambert, 2007).

To test these multilevel cases with latent interactions, Zyphur and colleagues (2019) outlined a Monte Carlo estimation approach where simulations estimate parameter estimates, and their asymptotic covariance matrix based on 10,000 generated estimates of effects, which are then used to generate 95% credible intervals empirically. The hypotheses testing (i.e., determine whether the *index of moderated mediation* is statistically different from zero) was carried out through credible interval evaluations (Hayes, 2015) such that if the credible interval does not include zero, then the indirect effect is moderated.

CHAPTER 3

RESULTS

Preliminary Analysis

Table 1 displays the means (*M*), standard deviations (*SD*), skewness, and kurtosis of all of the study variables by wave (i.e., age 8 and age 10). There were no cases in which the independent variable, mediating variable, or interaction product were above or below 3 SD from the mean. Table 2 displays the zero order intercorrelations (r) among all study variables; the correlation results were not adjusted for twin nesting. On average at the age 10 wave, children averaged 7.89 hours of sleep (true sleep which excluded wake bouts; *SD* = .71), 90.1% for sleep efficiency (*SD* = 5.47),1.69 for sleep problems (range 1 – 5; *SD* = .34), and 21.57% for body fat percentage (*SD* = 8.14). All sleep and weight indicators were highly correlated over time: sleep duration ($r = .53$, $p < .001$), sleep efficiency (*r* = .52, *p* < .001), sleep problems (*r* = .65, *p* < .001), and body fat percentage (*r* = .85, *p* < .001). Perceived neighborhood danger at age 8 was significantly correlated with body fat percentage at age 10 (*r* = .12, *p* = 04), but was not correlated with sleep duration (*r* = .01, *p* = .86), sleep efficiency (*r* = .08, *p* = .17), and sleep problems (*r* = .08, *p* = .09) at age 10. COI at age 8 was significantly correlated with sleep duration (*r* = .12, *p* = .01) and sleep problems (*r* = -.12, *p* <.001), but not correlated with sleep efficiency (*r* = .05, *p* = .28) and body fat percentage (*r* = -.08, *p* = .08) at age 10. PSS at age 8 was significantly correlated with sleep problems at age 10 (*r* = .25, *p* < .001). Positive parenting at age 8 was positively correlated with sleep duration (*r* = .17, *p* < .001) at age 10. Negative parenting at age 8 was significantly correlated with body fat percentage at age 10 (*r* = .15, *p* = .01). Familism reported by parents during the age 8 wave was significantly correlated with sleep duration (*r* = -.13 *p* = .01) at age 10.

Tests of multicollinearity was examined using the correlation analyses and collinearity diagnostics. First, we note that perceived neighborhood danger measured at the age 8 wave was negatively corelated with SES at both age waves (the age 8 wave: *r* = -.22, p < .001; the age 10 wave: *r* = -.30, p < .001) and COI measured at the age 8 wave (the age 8 wave: *r* = -.31, p < .001). COI measured at the age 8 wave is positively correlated with SES at both age waves (the age 8 wave: *r* = .49, p < .001; the age 10 wave: *r* = .46, p < .001). The collinearity statistics examining only the age 8 wave neighborhood values and SES at age 8 and the age 10 wave did not reveal significant concerns of multicollinearity (VIF range 1.147 – 1.387; Tolerance range .721 - .872). Note that a VIF above 4 or tolerance below 0.25 indicates the possibility of multicollinearity and VIF above 10 and tolerance lower than 0.1 indicates a significant multicollinearity (Miles, 2014). Noting that despite the significant correlations, the collinearity analyses revealed no concerns of multicollinearity.

T-tests and One-Way ANOVA. Independent t-tests were conducted to investigate group differences between participants who participated at the age 8 wave only and those who participated at both waves. Results revealed no significant group differences for the age 8 wave sleep duration (t (535) = -19, p = .23), sleep efficiency (t (535) = -1.32, p = .10), sleep problems (t (658) = 1.51, p = .59), and body fat percentage (t (566) = .87, p = .22). A similar independent t-tests were conducted between participants who participated at the age 10 wave and those who participated at both waves. The results revealed no significant group differences for the age 10 wave sleep duration (t (514) = -5.15, p = .93), sleep efficiency (t (514) = -.41, p = .21), and sleep problems (t (736) = .28, p = .43). However, there was a significant mean difference between the two groups for body fat percentage (t (497) = 2.45, p = .01) such that for those who only participated at the age 10 wave had higher body fat percentage (N = 149, M = 22.93, SD = 9.07) than the participants who participated at both waves (N = 350, M = 20.99, SD = 7.64).

Next, one-way ANOVA analyses were used to compare if there were any mean differences of gender, race, ethnic, and SES among those who only participated at the age 8 wave, only participated at the age 10 wave, and participated in both age 8 and the age 10 wave. There were no significant differences between the three groups on gender (F (2,928) = .10, p = .91), race (European descent; F (2, 908) = .45, p = .64), and ethnicity (F (2, 908) = 1.25, p = .29). However, there was a significant difference between the three groups by SES (F (2, 908) = 7.74, p < .001). Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that the average SES was significantly higher for those who participated at both time points (*M* = .06, *SD* = .79), than those who participated only at the age 8 wave (*M* = -.15, *SD* = .87) and the age 10 wave (*M* = -.16, *SD* = .84). The mean difference between the two groups that participated only at one time point was not significant.

Measurement of invariance. Before hypothesis testing, I first conducted measurement of invariance testing to examine whether the measured construct – familism - had discriminant validity. The configural invariance tested whether the constructs of familism scale had the same pattern across the European descent and Latino descent participants. The procedure is the same as those described in Bialosiewicz, Murphy, & Berry (2013). The results revealed that there was noninvariance at the configural level as there was poor model fit (RMSEA = .133; CFI = .63, SRMR = .09) according to the ideal standards in practice (RMSEA < .06; CFI > .95; SRMR < .08; Kim, 2020). This denotes the possibility for Type I error (i.e., rejection of the null hypothesis by mistake, statistical significance perhaps by chance). The next level of invariance testing (i.e., metric, scalar) was not conducted.

Direct Effects

The main effects models were examined separately for each outcome of interest. The models included perceived neighborhood danger, COI, baseline health or sleep, and the covariates. Sleep duration at age 10 was significantly predicted by European descent (*b* = .29, 95% CI [.07, .45]) and Latino descent (*b* = .25, 95% CI [.03, .41]) and by sleep duration at age 8 (individual level; *b* = .67, 95% CI [.62, .72]). Sleep efficiency at age 8 was positively associated with sleep efficiency at age 10 (individual level; *b* = .67, 95%

CI [.62, .72]). Sleep problems at age 10 was only significantly predicted by sleep problems at age 8 sat the individual-level (*b* = .74, 95% CI [.70, .77]). Body fat percentage was significantly predicted by body fat percentage at age 8 (individual level; *b* = .83, 95% CI [.79, .86]), gender also predicted body fat percentage at age 10 (*b* = .09, 95% CI [.02, .16]). The estimates of all variables were reflected in Table 4.

A post hoc test explored if perceived neighborhood danger and COI predicted concurrent sleep and weight health (Table 5). Again, perceived neighborhood danger and COI measured during the age 8 wave did not significantly predict sleep duration, sleep efficiency, sleep problems, and body fat percentage measured at age 8. Although the Bayesian posterior predictive fit statistics noted a good model fit, the between-level r^2 noted in Table 4 ranged between .73 - .91. As a comparison, the r^2 ranged between .18 - .27 for the recent post hoc cross-sectional analyses (Table 5). This change may be signifying that the stability paths are too strong when controlling for earlier health variables such that other variables cannot contribute to meaningful variance. A second post hoc analysis was conducted to examine if the regression analyses without controlling for the age 8 wave sleep and weight health provided additional insight. Similar to above, perceived neighborhood danger and COI assessed at the age 8 wave did not predict sleep duration, sleep efficiency, sleep problems, and body fat percentage at age 10 (Table 6). A third post hoc analysis was conducted to examine if the regression analyses without controlling for the age 8 wave sleep and weight health and parent SES provided additional insight. Here, COI significantly predicted sleep duration (*b* = .17, 95% CI [.01, .32]), sleep efficiency (*b* = .16, 95% CI [.004, .30]), and sleep problems (*b* = -.15, 95% CI

[-.28, -.01]), but not body fat percentage at the age 10 wave (*b* = .001, 95% CI [-.15, - ,15]; Table 7).

Mediating Effects

Aims 2a and 2b required a multilevel mediation analysis. The primary predictor for aim 2a was perceived neighborhood danger and for aim 2b it was COI. Otherwise, each of the models included the same covariates (i.e., sex, European descent, Latino descent, SES, vacation status, pandemic status) and controlled for the baseline health (age 8). Looking at the results for aim 2a, there were no direct effects between perceived neighborhood danger and sleep duration (*b* = 0.14, 95% CI [-.06, .34]), sleep efficiency (*b* = 0.02, 95% CI [-.13, .17]), sleep problems (*b* = -.18, 95% CI [-.34, .01]), and body fat percentage at age 10 (*b* = -.03, 95% CI [-.14, .09]). However, a significant relationship between perceived neighborhood danger and PSS is found (results from the model predicting sleep duration: *b* = 0.21, 95% CI [.10, .32]; see Table 8). Furthermore, PSS significantly predicted sleep efficiency (*b* = .17, 95% CI [.01, .31]), but not sleep duration (*b* = .10, 95% CI [-.14, .32]), sleep problems (*b* = .08, 95% CI [-.08, .24) and body fat percentage (*b* = -.02, 95% CI [-.14, .10]). The last step in the multilevel mediation model revealed a mediation between perceived neighborhood danger and sleep efficiency (*b* = .29, 95% CI [.003, .63]) via PSS at age 10.

To test the family stress model, a second-order mediation analysis was performed for the two significant complete mediation models using negative parenting as the second mediator. Negative parenting did not significantly predict sleep efficiency (*b* = -.03, 95% CI [-.22, .17]). Moreover, PSS did not significantly predict negative parenting (*b* = .13, 95% CI [-.01, .28]). Last, the second-order mediation pathway was not significant (i.e., danger → PSS → negative parenting → sleep efficiency: *b* = -.003, 95% CI [-.05, .04]). In summary, perceived neighborhood danger did not directly predict sleep efficacy: rather, this pathway was uniquely mediated by PSS (Zhao et al., 2010, Hayes, 2018, p. 119; see Table 8).

Analyses to test the mediating role of PSS between COI and sleep and weight outcomes (aim 2b) revealed no significant direct effects between COI and sleep duration (*b* = -.08, 95% CI [-.27, .11]), sleep efficiency (*b* = .03, 95% CI [-.10, .16]), sleep problems (*b* = -.02, 95% CI [-.12, .08]), and body fat percentage at age 10 (*b* = 0.6, 95% CI [-.05, .17]). Furthermore, COI did not significantly predict PSS across all of analysis ran for aim 2b (results from the model predicting sleep duration: *b* = 0.14, 95% CI [-.01, .38]; see Table 5). Therefore, additional steps to examine the mediating role of PSS between COI and health outcomes were not needed but reported in Table 5.

Moderating Effects

The moderating effects of positive parenting on associations between neighborhood conditions (i.e., perceived neighborhood danger [aim 3a], COI [aim 3b]) and health outcomes were first examined at the family level. Next, moderating effects of negative parenting on associations between neighborhood conditions (i.e., perceived neighborhood danger [aim 3c], COI [aim 3d]) and health outcomes were examined at the family level. The interactive effects of positive and negative parenting (Level-1) with neighborhood conditions (Level-2) were examined in two ways: 1) the interaction between child-specific positive parenting and neighborhood conditions (i.e., cross-level interaction) and 2) the interaction between parent-specific (i.e., average positive parenting within each family) and neighborhood conditions. Last, the moderating effect of familism on associations between neighborhood conditions (i.e., perceived neighborhood danger [aim 4a], COI [aim 4b]) and PSS were examined at the family level. All the results of the multilevel moderation analyses if found on Table 9.

Sleep duration. Adjusting for covariates, negative parenting (*b* = -.32, 95% CI [-.61, -.04]) and European descent (*b* = .43, 95% CI [.04, .69]) at the family level significantly predicted sleep duration at age 10. Perceived neighborhood danger did not significantly predict sleep duration (*b* = .14, 95% CI [-.12, .40]). Furthermore, positive parenting did not significantly moderate any of the between-person (*b* = .05, 95% CI [-.29, .49]) or cross-level associations (*b* = -.27, 95% CI [-.54, .15]) between perceived neighborhood danger and sleep duration at age 10. The interaction between perceived neighborhood danger and *negative* parenting on sleep duration revealed no significant cross-level interaction (*b* = .06, 95% CI [-.31, .46]). However, the between-level interactive effects of *negative* parenting and perceived neighborhood danger (*b* = -.36, 95% CI [-.77, -.05]) on sleep duration at age 10 were statically significant. The J-N plot suggested that in the context of higher positive parenting (values above -.01; about 40.1% of the sample), there was a negative association between perceived neighborhood danger and sleep duration (see Figure 2). In the context of lower positive parenting, there was no statistically significant association between perceived neighborhood danger and sleep duration.

In the next set of analyses, COI was used as the predictor. COI (*b* = -.10, 95% CI [-.30, .09]) and *positive* parenting (*b* = .12, 95% CI [-.17, .39]) at the between level did not significantly predict sleep duration at age 10, but *negative* parenting did predict sleep duration at age 10 (*b* = -.28, 95% CI [-.55, -.001]). At the individual-level, *positive* parenting did have a significant direct effect on sleep duration at age 10 (*b* = -.12, 95% CI [-.22, -.02]), but *negative* parenting did not (*b* = .04, 95% CI [-.04, .11]). As for interactive effects, the interaction between COI and *positive* parenting on sleep duration was not significant at the between-level (*b* = .01, 95% CI [-.27, .31]) or at the cross-level (*b* = .07, 95% CI [-.16, .25]). The interaction between COI and *negative* parenting on sleep duration was also not significant at the between-level (*b* = .25, 95% CI [-.01, .54]) or at the cross-level (*b* = .07, 95% CI [-.14, .24]).

Sleep efficiency. Adjusting for covariates**,** perceived neighborhood danger (*b* = -.02, 95% CI [-.21, .19]) and *positive* parenting (*b* = .42, 95% CI [-.23, .77]) did not significantly predict sleep efficiency at the family level. Furthermore, neither the between-level interactive effects between perceived neighborhood danger and *positive* parenting (*b* = -.18, 95% CI [-.37, .15]) nor cross-level interactive effects (*b* = -.38, 95% CI [-.87, .71]) on sleep efficiency at age 10 were significant. In a separate model which examined the moderating role of *negative* parenting independent of the *positive* parenting, *negative* parenting did not significantly predict sleep efficiency at age 10 at the family level (*b* = -.05, 95% CI [-.32, .23]) or at the individual level (*b* = -.02, 95% CI [-.11, .08]). There was a significant interaction between perceived neighborhood danger and *negative* parenting on sleep efficiency at age 10 (*b* = -.37, 95% CI [-.79, -.09]), but no significant cross-level interaction (*b* = .34, 95% CI [-.96, .97]). A J-N plot suggested that in the contexts of higher negative parenting greater than 0.4 (37.2% of the sample), perceived neighborhood danger was *negatively* associated with sleep efficiency. Conversely, in the contexts of lower negative parenting lower than -.1.15 (0% of the sample; lowest negative parenting value was -1.01), perceived neighborhood danger was *positively* associated with sleep efficiency (see Figure 3). However, in the contexts of average negative parenting (ranging between -1.15 to .04; 62.6% of the sample), there was no significant association between the perceived neighborhood danger context and sleep efficiency.

In the next set of analyses, COI was used as the predictor. At the family level, COI (*b* = -.002, 95% CI [-.18, .19]), *positive* parenting (*b* = -.08, 95% CI [-.19, .34]), and *negative* parenting (*b* = -.12, 95% CI [-.39, .15]) did not significantly predict sleep efficiency at age 10. At the individual-level, *positive* parenting also did not have a significant direct effect on sleep efficiency (*b* = -.09, 95% CI [-.16, -.003]). The interaction between COI and *positive* parenting on sleep efficiency at age 10 was not significant at the between-level (*b* = .15, 95% CI [-.12, .42]) or at the cross-level (*b* = .24, 95% CI [-.78, .90]). The interaction between COI and *negative* parenting on sleep efficiency at age 10 was not significant at the between-level (*b* = .12, 95% CI [-.11, .41]) and at the cross-level (*b* = .29, 95% CI [-.82, .87]).

Sleep problems. Perceived neighborhood danger (*b* = -.03, 95% CI [-.20, .15]), COI (*b* = -.04, 95% CI [-.19, .12]), *positive* parenting (*b* = -.05, 95% CI [-.26, .16]), and *negative* parenting (*b* = -.20, 95% CI [-.52, .24]) did not predict age 10 sleep problems at the between-level (Table 6). *Positive* parenting at the individual level significantly predicted sleep problems when perceived neighborhood danger was the predictor (*b* = .10, 95% CI [.04, .17]), but not when COI was the predictor (*b* = -.05, 95% CI [-.25, .13]). *Negative* parenting was not significantly associated with sleep problems at the individual level in either model (perceived neighborhood danger as the predictor: *b* = -.04, 95% CI [-.10, .03]; COI as the predictor: -.01, 95% CI [-.26, .14]). There were no significant interactive effects at the between-level (danger * *positive* parenting: *b* = -.02, 95% CI [-.35, .30]; COI * *positive* parenting: *b* = -.03, 95% CI [-.20, .14]; danger * *negative* parenting: *b* = .15, 95% CI [-.14, .44]; COI * *negative* parenting: *b* = -.04, 95% CI [-.26, .14]; see Table 6). There were also no significant cross-level interactions (danger * *positive* parenting: *b* = -.06, 95% CI [-.17, .07]; COI * *positive* parenting: *b* = -.02, 95% CI [-.07, .04]; danger * *negative* parenting: *b* = -.08, 95% CI [-.21, .08]; COI * *negative* parenting: *b* = .04, 95% CI [-.03, .10]; see Table 6).

Body fat percentage. Adjusting for covariates, perceived neighborhood danger (*b* = -.04, 95% CI [-.24, .19]) and COI (*b* = .04, 95% CI [-.14, .21]) did not significantly predict body fat percentage at age 10. *Positive* parenting did not significantly predict body fat percentage (model with COI: *b* = -.12, 95% CI [-.37, .09]); model with perceived neighborhood danger: *b* = -.03, 95% CI [-.29, .25]). There was a significant interaction between COI and *positive* parenting (*b* = .32, 95% CI [.10, .54]). The J-N plot suggested that in the context of lower positive parenting lower than -1.2 (4.8% of the sample), there was a negative association between COI and BFP (see Figure 4). In the context of average and higher positive parenting (greater than -1.2; 95.2% of the sample) , no significant association between COI and BFP were observed.

Negative parenting at the family level did not significantly predict body fat percentage at the between level in the model with perceived neighborhood danger (*b* = .17, 95% CI [-.13, .46]), but was a significant predictor in the model with COI (*b* = .31, 95% CI [.02, .53]). *Negative* parenting at the individual level did not significantly predict body fat percentage in either model (perceived danger: *b* = .11, 95% CI [-.02, .25]; COI: *b* = .10, 95% CI [-.06, .25], Table 6). There were no other significant interactive effects at the between-level (danger * positive parenting: *b* = .02, 95% CI [-.29, .43]; danger * negative parenting: *b* = .23, 95% CI [-.06, .56]; COI * negative parenting: *b* = .10, 95% CI [-.11, .32]). There were no significant cross-level interactions (danger * positive parenting: *b* = .33, 95% CI [-.92, .95]; COI* positive parenting: *b* = -.84, 95% CI [-.96, .33]; danger * negative parenting: *b* = -.88, 95% CI [-.99, .94]; COI * *negative* parenting: *b* = .91, 95% CI [-.09, .97]; see Table 6).

Parental stress and strain. To test the integrated model, the moderating effect of familism on associations between neighborhood conditions (i.e., perceived neighborhood danger [aim 4a], COI [aim 4b]) and PSS were examined at the family level. The results of the measurement invariance revealed that there was non-invariance at the configural level (i.e., poor model fit) therefore, the integrated model was tested only among the Latino-descent sample (*N* = 287). Participants who were missing perceived family danger, familism, *and* PSS were deleted from the analyses. The final sample size was *N* = 193. In the first test, the moderating role of familism between the associations of perceived neighborhood danger and PSS was examined. Perceived neighborhood danger (*b* = -0.05, C.I. [-.25, .14]) did not have a main effect on PSS, but familism did significantly predict PSS (*b* = 0.26, C.I. [.03, .46]). The interaction between familism and perceived neighborhood danger on PSS was not significant (*b* = -0.07, C.I. [-.27, .13]).

The second analyses of the integrated model examined the moderating role of familism between the associations of COI and PSS. COI (*b* = -0.14, C.I. [-.32, .06]) and familism (*b* = -0.07, C.I. [-.27, .14]) did not significantly predict PSS. The interaction between familism and COI was significant (*b* = .21, C.I. [.01, .39]). The J-N plot suggested that in the context of higher primary caregiver endorsement of familism as a cultural value (value greater than 3.9; 54.1% of the sample), there was a significant positive association between COI and PSS (Figure 5). In the context of average to lower levels of familism (values lower than 3.9; 45.9% of the sample) there were no significant associations between COI and PSS.

Moderated Mediation Effects

The aims 3e and 3f required a second stage moderated-mediation analysis (mediated effect is thought to be moderated by some variable; Edwards & Lambert, 2007). The aims 3e and 3f were only tested if there was a significant mediating effect of PSS between neighborhood factors and health outcomes during the initial mediation analysis reported above (see Table 5). Therefore, the second-stage moderation-mediation analysis was only tested for aim 3e (i.e., perceived neighborhood danger as predictor) and only for sleep efficiency (see Table 7). The results of aim 3e analysis revealed that the association between perceived neighborhood danger and sleep efficiency via PSS did not differ by varying levels of *positive* parenting (b = .08, 95% CI [-.61, .83]).

Lastly, aims 4c and 4d examined if familism was a significant moderator of the mediational pathway from neighborhood contexts to PSS and then health outcomes (first stage moderated mediation analysis; Edwards & Lambert, 2007). Only the interaction between COI and familism was significant, so the exploratory first stage moderated mediation analysis was conducted for aim 4b. Similar to the multilevel moderation analyses, a subsample was used. The sample criterion included being Latino-descent and having perceived neighborhood danger, familism, and PSS (N = 193). In addition, for this multilevel moderated mediation analysis required the participants to have sleep or weight health outcomes. This requirement further limited the sample size (N = 148). Adjusting for covariates, COI, familism, and PSS did not predict sleep or weight health (Table 7). Furthermore, the interaction between COI and familism was not significant in this model (using sleep duration at age 10 as an example: b = .08, C.I. [-.16, .32]). Lastly, the indirect effect of PSS on the associations between COI on sleep and weight health was not influenced by familism (no first stage moderated mediation; Table 7).

CHAPTER 4

DISCUSSION

Presently, many studies examine direct effects of neighborhood conditions or family level factors independent of each other (Burton & Jerrett, 2000; Entwisle, 2007; Noah, 2015). The relational developmental systems and the bioecological systems models highlight the importance of conceptualizing human development as the interactions of individuals and their environments as opposed to these entities acting separately (Bronfenbrenner & Morris, 2006; Lerner & Benson, 2013). Therefore, the present study examined the interactions between neighborhood contexts and family-level mechanisms in predicting children's subsequent sleep and weight health. There were four broad aims in this dissertation. The FSM, the CRM, and the integrated model helped guide the aims and hypotheses (Conger & Conger, 2002; Roche & Leventhal, 2009; White, Roosa, & Zeiders, 2012).

First, aims 1a and 1b examined if perceived neighborhood danger and COI were directly associated with subsequent sleep and weight health. It was hypothesized that more beneficial neighborhood conditions would be positively associated with better sleep and weight health. However, the hypotheses were not supported. Post hoc analyses were conducted to explore alternative conditions and further discussed in the next portion of the discussion section. Aims 2a and 2b examined if PSS and negative parenting serially mediated the associations between neighborhood contexts and subsequent sleep and weight health. It was hypothesized that higher PSS would significantly mediate the associations between neighborhood conditions and subsequent sleep and weight health. The results indicated that higher PSS mediated the associations between greater perceived neighborhood danger and greater sleep efficiency but did not mediate any other associations. Negative parenting did not further serially mediate any of the associations examined. The non-significant and the unique findings are further discussed in the later section.

Aims 3a and 3b examined if *positive* parenting moderated the associations between neighborhood conditions and sleep and weight health. For aim 3a, it was hypothesized that the negative association between perceived neighborhood danger and greater health outcomes would be attenuated for children who experienced greater positive parenting, as compared to children who experienced less positive parenting (*family compensatory processes*; Brody et al., 2014). The results did not support this hypothesis. For aim 3b, it was hypothesized that that the positive association between neighborhood opportunities and better sleep and weight health outcomes would be strengthened through positive parenting, as compared to children who experienced less positive parenting. In the context of lower positive parenting, lower neighborhood opportunities at the age 8 wave predicted higher BFP at the age 10 wave. However, positive parenting did not moderate the association between COI and sleep duration, sleep efficiency, and sleep problems. These results are further discussed in the later section of this discussion.

Aims 3c and 3d examined if *negative* parenting moderated the associations between neighborhood conditions and sleep and weight health. For aim 3c, it was hypothesized that the negative association between greater perceived neighborhood danger and poorer child sleep and weight health outcomes would be strengthened (or worse) for children who experienced greater negative parenting, as compared to children who experienced less negative parenting (*amplified disadvantaged processes*; Brody et al., 2014). The results indicated that in the context of average and higher levels of negative parenting, there was a significant negative association between perceived neighborhood danger and sleep duration, but the association was not significant in the context of lower levels of negative parenting. This result supported the hypothesis for aim 3c. For aim 3d, it was hypothesized that the positive association between neighborhood opportunities and child sleep and weight health would be attenuated for children who experienced greater negative parenting, as compared to children who experienced less negative parenting. Negative parenting did not significantly moderate the association between COI and later sleep and weight health, thus not supporting the hypotheses of this aim. These results are further discussed in the later section of this discussion.

Aims 4a and 4b examined if parent's familism values moderated the associations between neighborhood conditions and sleep and weight health. For aim 4a, it was hypothesized that greater endorsement of familism values would buffer the risks associated with greater perceptions of neighborhood danger on increased parental stress and strain. For aim 4b, it was hypothesized that greater endorsement of familism values will amplify the negative links between COI and parental stress and strain. However, measurement invariance testing of the familism between Latino and European American primary caregivers noted measurement non-invariance at the configural level. Therefore, the examination was conducted with only the families who had a Latino primary caregiver. The results for aim 4a were not significant. As for aim 4b testing, the multilevel moderation analyses indicated the inverse of what was hypothesized. In the context of higher endorsement of familism values, the positive association between COI and PSS was statistically significant, but in the context of average and lower endorsements of familism, the associations between COI and PSS were not statistically significant.

There were four exploratory aims. Aims 3e and 3f used second stage moderated mediation analysis to explore if the effect of neighborhood conditions on health outcomes via the mediating role of PSS varied based on the level of positive parenting. The aims 3e and 3f were only tested if there was a significant mediating effect of PSS between neighborhood factors and health outcomes during the initial mediation analysis. The results of aim 3e analysis noted that the association between perceived neighborhood danger and sleep efficiency via PSS did not differ by varying levels of *positive* parenting. Aims 4c and 4d used first stage moderated mediation analysis to explore if familism was a significant moderator of the mediational pathway from neighborhood contexts to PSS and then health outcomes. Only the interaction between COI and familism was significant, so the exploratory first stage moderated mediation analysis was only conducted for aim 4b. The results indicated no significant first stage moderation-mediation. The results of the exploratory aims and its contribution to the existing literature is discussed in the later section of this discussion.

Aim 1: Direct Effects of Neighborhood Contexts on Sleep and Weight Health

As presented above, the first part of the study, which estimated the direct effects of perceived neighborhood danger (age 8) and COI (age 8) on sleep and weight health at the age 10 wave, was not statistically significant. These results did not support the hypotheses and are inconsistent with existing literature that have found significant, positive associations between favorable neighborhood conditions (e.g., perceived danger, neighborhood SES, social cohesion) and better sleep health (see Mayne et al., 2021 for review). Although, there are some studies that have found no significant association between neighborhood safety and youth sleep (e.g., Troxel et al., 2017), the association is often observed across neighborhood studies (see Tomfohr-Madsen et al., 2020 for review). As for weight health, the association between neighborhood conditions and weight health are less consistent (see Daniels et al., 2021 for review). The study adds to the existing literature by assessing weight health using a bioelectrical impedance (BIA) device (e.g., Tanita Child Scale) which is presently the gold-standard in measuring body fat (Kettaneh et al., 2005). Moreover, neighborhood contexts were assessed using both objective and subjective measures of neighborhood risks and opportunities, as recommended by Daniels and colleagues (2021). This study contributes to building a body of evidence concerning neighborhood effects on weight health by using measurement techniques aligned with most recent recommendations.

Despite efforts to apply best practices, the study still had limitations. First, in the evaluation of the longitudinal model there was the possibility that the stability paths were too strong when controlling for earlier health variables such that other variables could not contribute meaningful variance or that there was not enough change in the outcomes over the two-year period. Therefore, the post hoc analyses explored associations between neighborhood conditions (the age 8 wave) and sleep and weight health (the age 10 wave) *without* controlling for age 8 health outcomes. The results were similar to primary findings; perceived neighborhood danger and COI did not significantly predict sleep and weight health at the age 10 wave. Although wide range of neighborhoods were represented in this study, most primary caregivers reported low perceptions of neighborhood danger. It is possible that the 3-item Neighborhood Quality Evaluation Scale (NQES) that was used to assess perceived neighborhood danger may not have detected important variability in the neighborhood contexts, which explains this incongruous finding between previous studies examining neighborhood effects on sleep health and the present study. The success of previous research using the NQES scale (e.g., White et al., 2009) may have been due to the better distribution of perceived neighborhood danger in the samples examined. In addition, there is a need to examine which conditions in the neighborhood are of concern to parents. Moreover, further investigation is needed to determine whether general concerns about neighborhood safety are associated with all health outcomes or whether particular concerns about safety are associated with specific health outcomes (e.g., traffic concerns may be directly associated with weight health but not sleep health). These efforts may promote the translation of research evidence into practice to reduce health disparities.

Many of the existing studies that have examined the cross-sectional links between neighborhood conditions and sleep health (see Mayne et al, 2021 for review). Therefore, another post hoc analysis was conducted to examine whether neighborhood conditions (i.e., perceived neighborhood danger, COI) during the age 8 wave predicted concurrent sleep and weight health during. Surprisingly, in contrast to the existing studies, the results of the post hoc cross-sectional analyses noted no significant links perceived neighborhood danger and sleep duration, efficiency, and problems. The lack of cross-sectional associations between perceived neighborhood danger and sleep health was further unexpected, given the evidence in a recent systematic review (i.e., 18 of 21 studies found links between primary caregiver reports of perceived neighborhood safety and various domains of sleep health for children and youth; see Mayne et al., 2021 for review). The discrepancy between the present result and the existing studies may be attributed to the limitation noted above (i.e., lack of variability of perceived neighborhood danger in the present sample). Another possible explanation for the differences in finding may be that many of the studies are using parent or teen reported sleep health as opposed to objective assessments of sleep (19 of the 21 studies in the literature review; see Mayne et al., 2021 for review). The present study adds to the literature by using objective and subjective assessments of sleep. Furthermore, neighborhood safety or danger are assessed differently across studies (e.g., objective measure of crime, perceived safety, exposure to violence in the neighborhood, concerns of violence exposures; see Mayne et al., 2021 for review). Lastly, it may be worth noting that only two of the 21 studies sample 6 to 12-year-old and additional eight of the 21 studies examine 6 to 17-year-old (see Mayne et al., 2021 for review). It is possible that neighborhood effects on sleep may significantly differ throughout life. For example, youth are more likely to independently explore the neighborhood context (Colburn et al., 2020) and children may be differently experiencing the neighborhood context through their home environment (Leventhal & Brooks-Gunn, 2003). There is a need to consider how neighborhood conditions differently effect sleep across the development.

The results of the post hoc cross-sectional analyses noted no significant links perceived neighborhood and body fat percentage. The lack of cross-sectional associations between perceived neighborhood danger and weight health was surprising as studies have noted that children living in the lowest quartile of neighborhood safety rating were more likely to be at risk for overweight status (Lumeng et al., 2006) and that maternal perceptions of neighborhood safety were directly associated with child weight status (Bacha et al., 2010). Furthermore, empirical evidence suggests that neighborhood safety or danger plays a significant role in middle childhood weight (Bacha et al., 2010; Timperio et al., 2005). However, the comparability of these studies is low since neighborhood safety has been measured differently in the various studies (e.g., child report, parent report, number of 911 calls, safe place to play, road safety; Burdette & Whitaker, 2004; Burdette & Whitaker, 2005; Evenson et al., 2007; Timperio et al., 2005; Veugelers et al., 2008). There is a need to further clarify how perceived neighborhood conditions affect objectively measured weight health.

The post hoc examination of the cross-sectional association between COI and sleep and weight health revealed no significant findings. However, one study examined if sleep sufficiency from the “500 Cities” data collected by the CDC was associated with the national COI and found a significant negative association (Phan et al., 2022). The differences in findings may suggest the need to better understand the spatial scale of COI's effects, future neighborhood studies should examine the COI more closely. COI has not been used to predict weight health in previous studies. When developing the present research, it was hypothesized that COI would be significantly associated with sleep and weight health as neighborhood (dis)advantages were previously associated with sleep and weight health (see Mayne et al., 2020 for review; see Carter & Dubois, 2010 for review). Furthermore, COI, or what COI conceptually represents (i.e., index of neighborhood economic, social, and educational opportunities within the block group), is similar to neighborhood SES and social disadvantage. Indeed, existing studies have noted significant cross-sectional associations between neighborhood SES and social disadvantage on sleep and body mass index (Grow et al., 2010; see Mayne et al., 2020 for review; see Mohammed et al., 2019 for review). The lack of significant cross-sectional associations between COI and children's sleep and weight health warrants further consideration. Unlike neighborhood perceived danger, COI was more normally distributed across the present sample. It is interesting to consider that COI may be capturing a different form of opportunities distinct from neighborhood SES. In which case, such findings should encourage future studies to use COI in their assessment of neighborhood conditions. More use of the COI is needed to address its benefits in neighborhood research.

The third set of post hoc analyses eliminated family level SES from the models to help in consideration of the potential selection bias (i.e., low-income families are more likely to move into low opportunity neighborhoods than high-income families, especially in urban areas; Xie et al., 2020). In this set of analyses, perceived neighborhood danger was not associated with sleep duration, efficiency, problems, and BFP at age 8. However, COI did significantly predict sleep duration, efficiency, and problems, but not BFP at age 8. It is plausible that family level SES, which precedes the decision to live in a certain neighborhood, may significantly predict concurrent sleep health to a greater degree than the neighborhood effects. Simultaneously, parental SES was having an effect on the neighborhood SES which may be contributing to later sleep health (e.g., neighborhood SES mediating the association between earlier parental SES and later sleep health). Perhaps this explains why studies that have examined children and youth health (e.g., BMI, healthy eating habits, self-reported overall health, asthma) under conditions of neighborhood change (e.g., new health grocery stores in a food desert, moving to a more opportune neighborhoods) find no associations (Cummins et al., 2014) or small effects (Fortson & Sambonmatsu, 2010; Gennetian et al., 2012). There is a need to further investigate the nuances of the interplay between family and neighborhood effects as well as the timing of its effects on concurrent and later sleep and weight health.

Hypothesis 2: Family Stress Model

The FSM (Conger & Conger, 2002) guided models that serially tested the mediating effects of PSS (age 8) and negative parenting (age 8) between the neighborhood contexts (age 8) and sleep and health outcomes (age 10), while controlling for covariates and sleep and health at age 8 (aims 2a and 2b). It was hypothesized that greater parental stress and strain and greater negative parenting would serially mediate the association between greater perceived neighborhood danger and shorter sleep duration, lower sleep efficiency, greater sleep problems, and higher body fat percentage (aim 2a). Furthermore, it hypothesized that greater parental stress and strain and greater negative parenting would serially mediate the association between lower COI and shorter sleep duration, lower sleep efficiency, greater sleep problems, and higher body fat percentage (aim 2b). Results from the multilevel mediation analyses partially supported aim 2a; PSS did not mediate the associations between perceived neighborhood danger and sleep duration, sleep problems, and BFP. Interestingly, PSS *did* mediate the association between perceived neighborhood danger and objectively measured sleep efficiency, such that greater perceived neighborhood danger predicted higher sleep efficiency at age 10, via higher parental stress and strain. Negative parenting did not serially mediate the association. For aim 2b testing, PSS did not mediate the associations between COI and sleep duration, sleep efficiency, sleep problems, and BFP.

These results are divergent from the existing literature (for reviews, see Barnett, 2008; Conger & Conger, 2002; Conger et al., 2010; Masarik & Conger, 2017). However, the present study differs from the previous studies that have examined the serial mediation of parental stress and disrupted parenting as it incorporated the recommendations from the two most recent literature reviews (Conger et al., 2010; Masarik & Conger, 2017). Conger and colleagues (2010) encouraged testing the FSM using longitudinal designs and Masarik and Conger (2017) expanded on the FSM by noting the need to examine the effects of neighborhood-level poverty and economic pressure as opposed to just family-level economic stressors. The present dissertation incorporated a longitudinal design and neighborhood economic strain into the hypotheses testing based on these recommendations.

Although the preliminary results of the present study were not significant, there is value in examining neighborhood effects on health. Indeed, there is little doubt that neighborhood effects on health and well-being exist. There is a need to reflect on the past neighborhood research and its limitations in order to meaningfully incorporate neighborhood effects to assess children and youth outcomes. One of the important considerations is the relative importance of neighborhood characteristics compared to individual and family characteristics on children and youth health and well-being (Jokela, 2014; Oakes, 2014). In fact, disciplines examining family-level effects on health (e.g., developmental psychology) call for incorporating neighborhood effects (Entwisle, 2007; Noah, 2015), while disciplines that examine neighborhood effects on health (e.g., sociology, public health) call for incorporating family-level effects (Burton & Jerrett, 2000). In order to bridge the gap, interdisciplinary efforts are needed to understand the complex nature of the multilevel bioecological systems described in the RDS, developmental systems theory, and the bioecological systems (Bronfenbrenner & Morris, 2006; Lerner, 2006; Lerner & Benson, 2013; Overton, 2013).

The limitations of the present study and recommendations for future research may contribute to the ongoing discussions on incorporating neighborhood-level influence into developmental studies. One of the limitations of the present study is not creating a third level in the multilevel analysis to reflect neighborhood conditions. Instead, the present study used family-level variable that reflects neighborhood conditions since many of the participants in the sample resided in their tract level alone and thus lacked clustering within neighborhoods across the broad sample (288 out of 348 had only one family living in each tract). Since the study's primary purpose was to compare family-level mechanisms rather than neighborhoods, a third level was not included in the multilevel model analyses. It is possible that the analytic approach or the study design and measurement did not appropriately capture neighborhood-level economic stress and strain, thus leading to the lack of associations between neighborhood variables and health outcomes. There is a need to critically consider the analytical differences between using a family-level variable that reflects neighborhood conditions versus creating a neighborhood-level (e.g., a third level) in multilevel modeling and apply the analytical methods that best fit the research question.

In addition to the consideration of neighborhood effects within the FSM (Masarik & Conger, 2017), there was a call to examine the mechanisms using a longitudinal model (Conger et al., 2010). The challenge of examining the underlying processes, mechanisms, or pathways through which neighborhoods influence individual health longitudinally continues to be an ongoing endeavor. The results of the study (or rather the lack of significant findings) suggest that emphasizing statistical techniques (e.g., three-level multilevel models; Diez-Roux, 2001; Geldhof et al., 2014; Noah, 2015) in conjunction with theory-driven research methods (Ham & 2011) may be needed to further investigate the neighborhood effects on children and youth health and well-being, independent of family level SES. In addition, research designs or sampling methods can be used as a strategy to further the understanding neighborhood effects (e.g., changes in residential contexts, comparing health status of high-income versus low-income families within the same neighborhood, comparing health status of low-income families living in high-opportunity versus low-opportunity neighborhoods). Lastly, the emphasis of utilizing both subjective and objective assessments of neighborhood conditions seem invaluable to the understanding of how the neighborhood space is benefiting residents.

In addition to addressing the non-significant findings, there is need to revisit the unexpected finding which noted that *greater* perceived neighborhood danger was associated with *greater* sleep efficiency via *higher* PSS. The direction of association between perceived neighborhood danger and sleep efficiency was inconsistent with hypotheses and unexpected. This result may be explained by the compensatory mechanisms in sleep – a process that was theorized by Sadeh and colleagues (2003) and hypothesized that sleep quality or efficiency increases as a regulatory response to lower levels of sleep minutes or overall duration (Sadeh et al., 2003; Mentink et al., 2020). Experimental sleep restriction studies have found that that on nights following experimental sleep restriction, sleep quality (e.g., sleep efficiency) increased (Devoto et al., 1999; Sadeh et al., 2003; Webb & Agnew, 1975). Existing empirical studies have noted that dangerous or disadvantaged neighborhoods have been linked with lower sleep durations, often via later sleep onset (for review, see Mayne et al., 2021). For example, in one study, seventh graders who perceived greater danger or threat within their neighborhood were more likely to have delayed or later bedtimes (Dowdell, 2003). It is possible that in neighborhoods with greater perceived danger children experience later sleep onset or shorter sleep durations which may be subsequently followed by increased sleep efficiency as a result of body compensating for the sleep deficit or disruption. Furthermore, the use of compensatory mechanisms in sleep to explain the significant mediation found in this study can be challenged as we did not see any significant main effects of perceived neighborhood danger on sleep duration.

Majority of the studies that examined family-level variables (e.g., home environment, parenting practices, parental mental health, availability of social networks) were found to explain all or part of the association between neighborhood conditions and developmental outcomes of children (e.g., emotional, behavioral, language; see Minh et al., 2017 for review). There is also some limited evidence of family-level variable (e.g., bedtime parenting practices, feed practices, parent-child interactions, parent stress) mediating the association between home environment and child sleep (Dubois-Comtois et al., 2019; El-Sheikh & Sadeh, 2015) and weight health (Frontini et al., 2015; Gouveia et al., 2019). The results of the present dissertation build on the scant literature and encourage the consideration of family process within the neighborhood context in the prediction of sleep later parameters. The counterintuitive result should be tested again in future studies, perhaps by extending the current research on sleep as a resource to facilitate coping. Wang and Yip (2019) found that after a stressful experience (e.g., discrimination), better sleep and a longer sleep duration promoted greater active coping among youth. However, the authors of this study examined stress that the youth experienced, whereas the present dissertation is noting that the stress experienced by the parents is mediating the association between context and sleep. There is a need to examine if sleep is being used as a biological-regulatory mechanism as a response to stress conditions (e.g., high perceived neighborhood danger, higher PSS) so that children are able to facilitate a more adaptive or active coping strategy the following days.

Lastly, the exploratory second stage moderated-mediation analysis results indicated that the association between perceived neighborhood danger and sleep efficiency via PSS did not differ by varying levels of *positive* parenting. Currently, there is little research that uses moderated mediation analysis to explore to relationship between neighborhood conditions with child health outcome via PSS and the moderating effects of positive parenting, so the results of the second stage moderated-mediation analysis cannot be compared to previous studies. A multilevel longitudinal moderated mediation analysis is relatively new, which may explain the scant research (Zyphur et al., 2019). A possible explanation of the nonsignificant finding in the present dissertation is the small sample size. Despite the Bayes estimation method and the use of Monte Carlo simulation providing the opportunity to model complex pathways using a smaller sample size, the existing studies that have conducted a multilevel longitudinal moderated mediation using Monte Carlo simulation had a larger sample (e.g., Dendup et al., 2021; Laroque et al., 2022). As a final point, many of the studies have utilized the FSM framework to predict children and youth outcomes, broadly: externalizing (Neppl et al., 2015; Shaw & Shelleby, 2014), academic performance (Iruka, 2012), internalizing symptoms (Landers-Potts et al., 2015) and poor physical health (McCurdy et al., 2010) in early- and middle- childhood. In light of the results of this study, perhaps it is necessary to review which aspects of development (e.g., physiological, psychological, behavioral) FSM helps illustrate rather than applying it broadly to children and youth outcomes. Future work should be conducted to review both published and unpublished studies to provide specificity on which outcomes are most supported by the theorized pathways from the FSM.

Hypothesis 3: Contextual Relevance Model

Aims 3a – 3b examined if *positive* parenting moderated the associations between neighborhood conditions and sleep and weight health. Aims 3c – 3d examined if *negative* parenting moderated the associations between neighborhood conditions and sleep and weight health. The aims were developed using the three relationship types between parental processes and ecological contexts described in the CRM: amplified advantages, family compensatory, and amplified disadvantages (Roche & Leventhal, 2009). For aim 3a, it was hypothesized that the negative association between neighborhood danger and greater health outcomes would be attenuated for children who experienced greater positive parenting, as compared to children who experienced less positive parenting (*family compensatory processes*; Brody et al., 2014). Positive parenting did not significantly moderate the associations between perceived neighborhood danger and sleep and weight health. Results did not support hypotheses. This study is the first to examine the moderating effects of positive parenting on associations between neighborhood conditions and sleep and weight health. However, previous studies have found supportive evidence of positive parenting as a compensatory process for child and youth development within high-risk contexts. For example, a longitudinal study of 166 adolescents in Australia showed that positive parenting mitigated the risks of neighborhood socioeconomic disadvantages on frontal lobe development (Whittle et al., 2017). Among a sample of preschool children, positive parenting attenuated the link between peer victimization and insomnia, behaviors of parents can protect youth facing peer victimization risks (Bilodeau et al., 2018). Furthermore, nurturing home environments buffered the risks of high-poverty neighborhoods and promoted child health (Komro et al., 2011). These studies support continued examination of modifiable family level variables that may moderate the association between neighborhood disadvantages on health. It is possible that the results of the aim 3a hypotheses testing may have been due to the lack of variability of perceived neighborhood danger. There is a need to examine the moderating role of positive parenting on associations between perceived danger and children's sleep and weight health among a sample with a better distribution of perceived neighborhood danger to inform prevention and intervention strategies for children at greater risk for poor health outcomes.

For aim 3b, it was hypothesized that that the positive association between neighborhood opportunities and better sleep and weight health outcomes would be strengthened through positive parenting, as compared to children who experienced less positive parenting. Positive parenting did not moderate the association between COI and sleep duration, sleep efficiency, or sleep problems, but it moderated the association between COI and body fat percentage. In other words, in contexts of lower positive parenting, COI was negatively associated with later BFP, but the association was not significant in average and higher positive contexts. As mentioned in the above paragraph, this study is the first to examine the moderating effects of positive parenting on the associations of neighborhood conditions and sleep and weight health. Previous studies have more commonly examined the moderating role of parental SES on the associations between neighborhood disadvantages and health (Bader et al., 2013; Roubinov et al., 2018; Zhou et al., 2019). The present dissertation aimed to add onto the existing literature by examining if other family-level factors moderated the associations between neighborhood context and health outcomes beyond family-level SES.

The non-significant findings in the aim 3b hypotheses testing highlights the need for further consideration the processes by which neighborhood opportunities benefit sleep health. As for weight health, this result may be indicating that positive parenting is buffering the risk of living in a low-opportunity context. Alternatively, results may suggest how a neighborhood with greater opportunities can benefit children even in the absence of positive parenting (e.g., the neighborhood is actively compensating for the risks at home). Existing studies more commonly find the risks of residing in non-supportive or at-risk neighborhoods on weight health (Borrell et al., 2016). The present findings add to the CRM and the existing neighborhood studies that more often examine the direct effects of neighborhood disadvantages on wellbeing (i.e., deficit focused) by noting this neighborhood compensatory process. The examination of the neighborhood as a compensatory process is important as it encourages future considerations of modifiable neighborhood conditions that may attenuate more proximal developmental risks (e.g., peer relations, home life). For aim 3c, it was hypothesized that the negative association between greater perceived neighborhood danger and poorer child sleep and weight health outcomes would be worse for children who experienced greater negative parenting, as compared to children who experienced less negative parenting (*amplified disadvantaged processes*; Brody et al., 2014). The association between perceived neighborhood danger and sleep duration and sleep efficiency was significantly moderated by negative parenting. Whereas, the association between perceived neighborhood danger and sleep problems and body fat percentage was not significantly moderated by negative parenting. As hypothesized, in the contexts of higher levels of negative parenting there was a significant negative association between perceived neighborhood danger and sleep duration. This pattern reflected *amplified disadvantages processes* which describes contexts where the harm of ineffective parenting is most significant for youth living in high-risk neighborhoods (CRM; Roche & Leventhal, 2009). Existing studies indicate that family environments (El-Sheikh & Kelly, 2017; see Tikotzky, 2017 for review) and neighborhood environments (for reviews, see Newton et al., 2020; Mayne et al., 2021) factors play independent roles in sleep duration. The result of the study adds to the existing literature by considering how neighborhood- and family- level factors may be interdependent.

In the investigation of the moderating role of negative parenting on the associations between perceived neighborhood danger and sleep efficiency, the study found that in the contexts of higher negative parenting, the perceived neighborhood danger was negatively associated with sleep efficiency. Conversely, in the context of lower negative parenting, the assocaition perceived neighborhood danger and sleep efficiency was positively significant; these associations reflect conditions outside of the three conditions outlined in the CRM (Roche & Leventhal, 2009). The inverse relationship between perceived neighborhood danger and sleep efficiency which varied based on the level of negative parenting may represent the extent to which sleep efficiency can be used as a compensatory mechanism in sleep. Under higher perceived neighborhood danger and lower negative parenting conditions, sleep efficiency may be used as a compensatory mechanism (Dahl & Lewin, 2002; Sadeh & Gruber, 2002). However, under higher perceived neighborhood danger *and* higher negative parenting conditions, sleep efficiency may not be able to compensate for such dual-risk or high stress context. There is some evidence to suggest that sleep efficiency as a compensatory mechanism is only present at moderate (but not high) levels of stress (Astill et al., 2013). Astill and colleagues (2013) found that during a regular school week, decreased sleep duration was accompanied by an increase in sleep efficiency (e.g., compensatory mechanism of sleep), but during weeks with school examinations (i.e., period of prolonged stress) decreased sleep duration was accompanied by a decrease in sleep efficiency (e.g., undermining the compensatory mechanism of sleep). These nuances further contribute to our understanding of the connections or the interactions between family-level mechanisms and neighborhood-level conditions that influence sleep. There is a need to further test compensatory mechanisms of sleep as well as the conditions under which such compensatory mechanism may be undermined.

One of the limitations of this study is not considering how children may be differentially susceptible to environmental influences depending on their individual *psychobiological reactivity to stress* (biological sensitivity to context [BSC]; Ellis & Boyce, 2008). Within adolescent research, there is evidence that youth that scored higher on a mental toughness questionnaire had higher sleep efficiency, lower number of awakenings after sleep onset, less light sleep, and more deep sleep compared to youth with who reported low on the mental toughness questionnaire (Brand et al., 2014). Among undergraduate students, changes in sleep duration and sleep quality during high-stress periods were significantly moderated by the coping style (Sadeh et al., 2004). Such studies suggest that some individuals (i.e., those with greater mental toughness, more adaptive coping styles) may be less sensitive to their contexts thus encouraging the incorporation of individual-level factors to future studies.

For aim 3d, it was hypothesized that the positive association between COI (assessed during the age 8 wave) and child sleep and weight health (assessed during the age 10 wave) would be attenuated by greater negative parenting assessed during the age 8 wave. The results did not support the hypothesis; findings suggested that negative parenting did not moderate the associations between COI and later sleep and weight health. Presently, studies examining neighborhood effects (e.g., neighborhood SES, community violence) on child and youth sleep health have more commonly used demographic variables (e.g., gender, age, ethnicity, parental education, family SES) to conduct moderation analyses (Philbrook et al., 2019; see Tomfohr-Madsen et al., 2020 for review). In addition to the existing understanding of the individual differences in response to neighborhood conditions, the present study investigated if there were modifiable family-level factors that moderated the associations between neighborhood and health. The investigation was in response to a recent literature review examining obesogenic neighborhood environment which noted the need to further examine how proximal processes (e.g., parents, siblings, friends, schools) interact with the neighborhood social, socioeconomic, and built environments and affect childhood obesity (see An et al., 2017 for review; see Newton et al., 2020 for review). It may be necessary to examine both proximal processes and individual differences or examine whether proximal processes buffer the risks among groups deemed more at risk.

Aim 3e and 3f explored if the effect of neighborhood conditions on health outcomes via the mediating role of PSS varied based on the level of positive parenting. Hypotheses were not provided as these were exploratory analyses. Aims 3e and 3f were only tested if there was a significant mediating effect of PSS between neighborhood factors and health outcomes during the initial mediation analysis (aims 2a and 2b). Since PSS only significantly mediated the association between perceived neighborhood danger and sleep efficiency, one second stage moderated mediation analysis was conducted. The results of aim 3e analysis noted that the association between perceived neighborhood danger and sleep efficiency via PSS did not differ by varying levels of *positive* parenting. There have been very few studies that examined the interactions across multiple contexts and levels of influence on children across developmental stages. Most that have conducted this level of analysis have focused on the family context (as opposed to the neighborhood context (Dubois-Comtois et al., 2019). One study that set out to examine whether supportive parenting moderated the associations between neighborhood contexts (e.g., social disadvantages, physical environment) and child self-regulation (first stage moderated mediation) and self-regulation and BMI (second stage moderated mediation) was unable to conduct any moderated mediation analyses as child's self-regulation did not significantly mediate the association between neighborhood conditions (assessed at age 5) and child BMI at age 10 (Hails, 2021). There is a lack of clarity regarding how multiple contexts and levels interact and mediate the connection between neighborhood and child wellbeing based on the findings of this dissertation and this previous study. More research is needed to understand the complex nature of multilevel bioecological systems described in RDS, developmental systems theory, and bioecological systems (Bronfenbrenner & Morris, 2006; Lerner, 2006; Lerner & Benson, 2013; Overton, 2013).

Hypothesis 4: Integrated Model

The original goal of this study was to examine the moderating role of familism cultural values (the age 8 wave) on associations between neighborhood context (the age 8 wave) and PSS (the age 8 wave), as illustrated by the Integrated Model (White, Roosa, & Zeiders, 2012). However, the measurement invariance testing of the familism between Latino and European American primary caregivers noted measurement non-invariance. Therefore, analyses for aim 4a and 4b were only conducted among families where the primary caregiver self-identified as Latino. For aim 4a, it was hypothesized that greater endorsement of familism values would buffer the risks associated with greater perceptions of neighborhood danger on increased parental stress and strain. For aim 4b, it was hypothesized that greater endorsement of familism values would amplify the negative links between COI and parental stress and strain. Further, in an exploratory manner, it was also examined whether familism moderated the mediation pathways testing the broader FSM and integrated model. The results from the multilevel moderation model using the subsample indicated no significant direct effects of perceived neighborhood danger and COI on PSS. Further, familism did not significantly moderate the associations between perceived neighborhood danger and PSS. However, familism *did* significantly moderate the associations between COI and PSS such that among primary caregivers who reported high levels of familism. In the context of greater familism values, the association between COI and PSS was more significantly *positive* which was the opposite of what was hypothesized.

Studies that have examined direct effects of familism often note it as a promotive factor as opposed to a risk factor (see Cahill et al., 2021 for review). However, among studies that have examined the *moderating* role of familism on links between the neighborhood context and parenting among Mexican American families identified that high levels of familism within disadvantageous neighborhoods (e.g., high perceived neighborhood danger) predicted more harsh parenting (White, Roosa, & Zeiders, 2012; White et al., 2015; White et al., 2019). Similarly, Filipino fathers who reported high or average levels of familism and lived in poorer living conditions were more likely to report higher paternal rejection of their child (Jocson, 2020). While this study examined the moderating role of familism in the relationship between COI and PSS rather than the moderating role of familism in neighborhood context and parenting styles, the findings across the studies suggest an interesting, unexpected moderating role of familism. There is a need to replicate the present results. Furthermore, there is a need to investigate the interactive effects of familism and neighborhood contexts on parenting and parent stress.

One explanation is offered by a qualitative study of 23 Latina mothers who suggested that familism, specifically behavioral components of familism, may be a risk factor for families (Calzada et al., 2012). There is a need to further evaluate how this concern varies within the neighborhood context. Another possible speculative consideration may be the incongruity between individual level status (e.g., SES status) and their place of residence. For example, one study found that among low-income participants who had higher levels of education that were living in higher SES neighborhoods were more likely to have social problems and internalizing symptoms compared to other low-income participants living in lower SES neighborhoods (Santiago et al., 2011). The authors speculated that this result may be due to incongruous individual level of education and occupational status and their income (e.g., able to live in higher SES neighborhoods, but categorized as low-income; Santiago et al., 2011). Alternatively, the results may reflect the distribution of neighborhood opportunities and for whom these resources most benefit (Levy, 2022). Studies in the past have noted that low sense of belonging in the neighborhood is associated with low use of neighborhood resources — even if they are health-promoting (Eriksson & Emmelin, 2013; Mujahid et al., 2007; Triguero-Mas et al., 2021). Indeed, scholars noted the need to include the history of space (e.g., segregation, discrimination, inequality) and the existing social stratifications (e.g., race/ethnicity, social class, and gender; McLeod, 2013) in order to fully contextualize place effects on health (Braveman, 2014; Diez-Roux & Mair, 2010). All of these possible explanations illustrate how the nuances of individual life (e.g., expectations, experiences, cultural values) and environmental conditions interact and produce different outcomes and invite further examination of the mechanisms that are culture and community specific.

Lastly, the results of the exploratory multilevel first stage moderated mediation models tested if familism was a significant moderator of the mediational pathway from neighborhood contexts to PSS and then health outcomes. The first stage moderated mediation analysis was only conducted for aim 4b and not 4a, since only the interaction between COI and familism was significant. The results indicated no significant first stage moderation-mediation. Despite this, there is a need to continue investigating the mechanisms behind culturally defined adaptations to neighborhood environments by replicating the study among a larger sample. There is some evidence of adaptive cultural responses to environmental contexts. For example, one study found that parent perceived economic pressures (family-level) positively predicted externalizing symptoms via disruptions to maternal warmth, but only when mothers were lowest on familism values (White et al., 2015). There is a need to examine how adaptive cultural responses to environmental contexts differently affect well-being (e.g., health, externalizing behavior, internalizing symptoms) across the lifespan (e.g., early-childhood, adolescence; García Coll et al., 1996).

Limitations and Future Research Directions

There are some noteworthy strengths in the current dissertation, but some limitations should also be considered. One of the important strengths is the study design. The Arizona Twin Project is a large, state-wide sample of children and recent assessments included a wide range of subjective and objective data collection methods which is deal for the examination of complex developmental questions. However, the study required multiple stages of involvement from the participants and their parents. There is some evidence of primary caregiver burnout across the three surveys that were sequentially sent to participants during the age 8 wave. Indeed, the third survey, which predominantly assessed parent health and well-being from which the eight PSS measures were drawn had 18.79% full-missing data. Perhaps decreasing the number of assessments or shortening the length of the surveys may help with the missingness. In addition, attrition analyses examining the demographic differences across the study waves noted that the socioeconomic status among those who participated at both time points were higher than those who participated at the age 8 wave only or the age 10 wave only. Indeed, researchers often note lower enrollment rates of minoritized and low-income participants (Walter et al., 2013). Worthy of note, race and gender were consistently represented throughout (no significant mean differences) which is a strength of the dataset (e.g., generalizability). The challenge of increasing the retention of low-income families is an ongoing effort, but for now remains a limitation of the dataset. Despite the possible participant burnout, many participants did return for the age 10 assessment (78.2% retention rate), which may indicate the quality of the community outreach and engagement from the researchers.

Next, the present dissertation was unable to address a broader methodological limitation across the disciplines that examine neighborhood effects on health: the lack of comparability (Bishop et al., 2020; Noah, 2015). Many studies examining associations between perceived neighborhood safety and health (e.g., sleep, weight) have not consistently operationalized perceived neighborhood safety (for reviews, see An et al., 2017; Mayne et al., 2021). For instance, one study examined perceived neighborhood safety using a single question (Chen et al., 2013), others have used questions regarding community violence exposure (Heissel et al., 2018; Rubens et al., 2014) or experiences of traumatic events in the neighborhood (Wamser-Nanney & Chesher, 2018), while another used the Neighborhood Walkability Scale (Bagley et al., 2016). The present study used a 3-item Neighborhood Quality Evaluation Scale (Kim et al., 2009; Roosa et al., 2005). The measurement differences limit the interpretability and applicability of research into policy. Defining and operationalizing neighborhood dimensions is an ongoing challenge across disciplines and requires continued attention (Braveman, 2014; Diez-Roux & Mair, 2010; Galster, 2012; Hipp, 2007; Sharkey & Faber, 2014).

One of the strengths of the study was to use of COI. The COI, created by Noelke and colleagues (2020), was developed with the limitation of comparability in mind. The COI offers a strong overview of education, health, and economic opportunities in all neighborhoods across the United States at two time points 2010 and 2015. The integration of COI into children's and youth's health studies collected during 2010 and 2015 would provide a more comprehensive understanding of how neighborhood opportunities affect health outcomes. One of the limitations of the COI is that it does not assess social opportunities (e.g., social capital, collective efficacy). Considering the benefits of social cohesion and collective efficacy on reducing health disparities (see Butel & Braun, 2019 for review) assessing these social opportunities in the neighborhood along with COI may provide a more comprehensive understanding of neighborhood (dis)advantages. Furthermore, future neighborhood studies consider spatial and temporal uncertainty (Kwan, 2012). The spatial uncertainty notes that the actual areas that influence individual outcomes are unknown. Similarly, temporal uncertainty recognizes the unknown timing and duration of individual experiences with contextual influences. The blurry spatial- and temporal- dimensions make neighborhood research more challenging, especially for developmental psychologists trying to understand these processes occur throughout one's development.

Another limitation of the present study is the lack of consideration bidirectional associations in the transactions between parents and children (e.g., evocative gene-environment correlation [*r*GE]). Indeed, studies have noted that children's characteristics (e.g., temperament, attachment styles, effortful control) influence parenting practices (Hong & Park, 2012; Lemery-Chalfant et al., 2013; Putnam et al., 2002). Furthermore, studies that tested models of polygenic by environment interactions noted that early childhood family instability and polygenic risks predicted developmental trajectories of externalizing behaviors (Elam et al., 2017; Elam et al., 2022) and internalizing symptoms (Lemery-Chalfant et al., 2018). Presently, parenting styles appear to moderate genetic and environmental influences on early childhood body weight (5 years of age) but not among children ages 11 and 17 years (Ji & An, 2022). These findings support the need to model evocative gene-environment interplay to elucidate the role of individual characteristics and genetics in human development.

Implications for Policy and Practice

This multi-part study focused on sleep and weight health using the FSM, CRM, and the integrated model (Conger & Conger, 2002; Roche & Leventhal, 2009; White, Roosa, & Zeiders, 2012). Findings suggest that research on the effects of neighborhood conditions on children's sleep and weight health may benefit from incorporating specific elements of the FSM and CRMs. Specifically, examining the mediating and moderating role of parental stress and strain, (positive and negative) parenting, and parental cultural values has provided some unexpected, yet meaningful understanding of how neighborhood contexts influence children's sleep and weight. The results of the present study encourage policymakers to consider the more nuanced systems between the individual and the environment that is illustrated in the relational developmental systems and bioecological systems models (Bronfenbrenner & Morris, 2006; Lerner & Benson, 2013). Research should continue to test the mechanisms described in the FSM, CRM, and the integrated model independently and in combination (Conger & Conger, 2002; Roche & Leventhal, 2009; White, Roosa, & Zeiders, 2012).

Several significant findings of this study were unexpected and requires further testing. The mediating role of higher PSS between neighborhoods with greater perceived danger and increased sleep efficiency should be further examined in future studies and the moderating role of negative parenting to the associations between perceived negative parenting and sleep duration and sleep efficiency seem to somewhat align with what was proposed in the compensatory mechanism for sleep disruption (Sadeh et al., 2003). There is a need to replicate the findings and further establish if the combination of neighborhood and family level risks increase children's hypervigilance and hypersensitivity, lead to shorter sleep duration, and subsequently increase sleep efficiency.

As for understanding weight health, the present study found that living in areas with lower opportunities predicted higher BFP for youth with low positive parenting, but not among families with average and high positive parenting. There is a need to further investigate if positive parenting is buffering the risk of living in a low-opportunity context or if greater neighborhood opportunities are benefiting children even if there is an absence of positive parenting at home (e.g., the neighborhood is actively compensating for the risks at home). Neighborhood physical and social conditions were more consistently associated with children and youth weight health in the existing literature (Borrell et al., 2016). Understanding that healthy behaviors established during early- and middle- childhood benefit later health (for review, see Jones et al., 2013), there is a need to further investigate if neighborhoods can serve as a beneficial resource for children who may have high-risk or high stress lives at home.

CHAPTER 5

CONCLUSION

Findings from the present study highlight the dynamic relationships between neighborhood contexts, family stress, parenting, and children's sleep and weight health. The study attempted to utilize best research practices and the current recommendations of quantitative analyses to reflect the complex relations noted in the RDS theory and the multilevel bioecological systems model (Bronfenbrenner & Morris, 2006; Lerner, 2006; Overton, 2013). These results join a growing initiative to explore the science of ecological context, culture, and family interplay (Burton & Jerrett, 2000; Entwisle, 2007; García Coll et al., 1996; Noah, 2015; Pasco, White, & Seaton, 2021; Romero et al., 2020; Velez-Agosto et al., 2017). The study findings also suggest the need for further evaluation of the effects of positive parenting, negative parenting, parental stress, and cultural values within the ecological/neighborhood context. Furthermore, to improve upon the study, there is a need to evaluate the spatial- and temporal- effects of the neighborhood on children's health and well-being across their development (e.g., considering length of residence and change of residence, defining what neighborhood means to the participants).

Poor neighborhood conditions add to the challenge of raising children in low-income homes (Cole, 2019; Triguero-Mas et al., 2021) and disproportionately affect families of color (Bower et al., 2014; McLeod, 2013). Indeed, studies examining neighborhood effects on children and youth health often examine neighborhoods as a risk (for review, see Arcaya et al., 2016). However, there is a possibility that neighborhoods could be assets. There is a need to identify the community and socio-cultural factors within the neighborhood that help encourage health and well-being among the children and youth and socially and financially invest in those spaces (Bailey et al., 2014; García Coll et al., 1996; Velez-Agosto et al., 2017). Investments in neighborhoods should extend beyond addressing single problems at a time (e.g., putting in healthy grocery stores in food deserts; Cummins et al., 2014). Rather, investments in the neighborhood that creates meaningful opportunities (e.g., social, educational, financial) and addresses the needs that are presently limiting low-income families from improving their circumstances (e.g., affordable housing, accessible transportation, public safety, jobs that offer social mobility; Woolf, 2017) is needed to address the existing health disparities (U.S. Department of Health and Human Services [USDHHS],2021).

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APPENDIX A

Table 1. *Participant Demographics and Descriptive Statistics*

Participant Demographics	The age 8 wave		The age 10 wave	
	n	%	*n*	%
Twin Status				
monozygotic twin pairs				
same-sex dizygotic twin pairs	214	30.4	228	29.2
opposite-sex dizygotic twin	268	38.1	282	36.2
pairs	219	31.2	262	33.6
Sex				
Male	343	48.8	375	48.1
Female	360	51.2	403	51.7
Ethnicity				
Non-Hispanic White/Euro				
American	396	56.3	415	56.5
Hispanic/Latino	160	22.8	188	25.6
Asian/Asian American	23	3.3	19	2.4
Black/African American	26	3.7	24	3.1
Native American	18	2.6	22	2.8
Native Hawaiian	6	0.9	4	0.5
Bi-/Multi Racial	41	6.1	50	6.8
Other	4	0.6	12	1.5
Vacation				
Summer/Vacation Participation	497	71.9	539	57.8
Not Summer/ Vacation	194	27.6	229	24.5
Pandemic Status				
Before 03/16/2020	--	--	769	82.4
After 03/16/2020			164	17.6
Income-to-needs Ratio				
Living in Poverty	42	7.4	38	6.6
Near the Poverty Line	126	22.3	124	21.6
Lower Middle Class	90	16.0	130	22.6
Middle to Upper Class	304	54.0	282	49.1
Primary Caregiver Education				
Less than high school				
High school or equivalent	4	.6	8	1.1
Some college	62	8.8	52	6.7
College degree	181	25.7	206	26.4
Two or more years of graduate	247	35.1	279	35.8
school	24	3.4	31	4.0
Graduate or professional degree	156	22.2	158	20.3

Descriptive Statistics	*n*	*M*	*SD*	*Skew*	*Kurtosis*	*n*	*M*	*SD*	*Skew*	*Kurtosis*
Age	695	8.43	0.68	-0.17	-0.39	742	10.88	1.15	0.57	1.24
Sleep Duration	537	8.12	0.71	-0.38	0.14	516	7.89	0.71	-0.41	0.20
Sleep Efficiency	537	90.1	5.47	-0.87	0.54	516	91.2	5.60	-1.06	0.74
Sleep Problems	660	1.74	0.35	0.71	0.89	742	1.69	0.34	1.08	2.04
Body Fat Percentage	568	20.1	6.50	1.42	2.71	499	21.57	8.14	0.97	0.71
Perceived Neighborhood Danger	533	1.47	0.70	1.88	4.10	--	--	--	--	--
Overall COI	695	3.45	1.36	-0.38	-1.17	--	--	--	--	--
Parental Stress and Strain	475	0.00	1.00	0.94	0.73	--	--	--	--	--
Positive Parenting	567	0.36	0.12	0.38	-0.17	--	--	--	--	--
Negative Parenting	567	0.12	0.09	1.41	2.54	--	--	--	--	--
Parental Familism	643	3.91	.56	-0.80	1.04	--	--	--	--	--

Note. The age 8 wave $N = 703$. The age 10 wave $N = 780$. Sleep Problems = Child Sleep Habits Questionnaire. Sleep Duration = Time (in hours) first sleep onset to sleep offset, excluding all bouts of waking and latency prior to first onset. Sleep Efficiency = ratio of time spent asleep to total time in bed, with total time in bed including true sleep, bouts of waking, and latency prior to first sleep onset. Perceived Neighborhood Danger: Neighborhood Quality Evaluation Scale. Overall COI = Child Opportunities Index 2.0. Parental Stress and Strain: Composite of eight measures (Table 2). Positive and Negative Parenting: Parent-Child Interaction Task coded. Parental Familism: Mexican American Cultural Value Scale.

Table 2. *Measures included in the Parental Stress and Strain Composite (8-year assessments)*

Construct	**Measure**	**Sample Items**	**Alpha (8 year)**	**N**
Daily hassles	Parenting Daily Hassles Frequency Scale (Crnic & Greenberg, 1990)	15 items; Continually cleaning up kids' messes; Kids don't listen, won't do what they are asked without being nagged	.85	529
Spouse/ Partner Strain	Spouse/Partner Strain Scale (adapted from Schuster et al., 1990; Whalen & Lachman, 2000)	6 items; How often does your spouse or partner make too many demands on you?; How often is he or she critical of your behavior?	.89	481
Perceived Stress	Perceived Stress Scale (Cohen et al., 1983)	4 items; How often have you felt that you were unable to control the important things in your life?; How often have you felt that things were going your way?	.74	527
Interpersona l Support	Interpersonal Support Evaluation List (reverse scored; Cohen et al., 1985)	12 items; There is someone I can turn to for advice about handling problems with my family; If I were sick, I could easily find someone to help me with daily chores	.91	529
Chaos in the home	Confusion, Hubbub, and Order Scale (Matheny, Wachs, Ludwig, & Phillips, 1995)	10 items; No matter how hard we try we always seem to be running late; It's a real "zoo" at our home	.72	643
Depressive symptoms	Center for Epidemiological Studies – Depression Scale (Radloff, 1977)	20 items; I felt that I could not shake off the blues even with the help of my family/friends; I felt lonely	.88	545
Anxiety Symptoms	Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995)	14 items; I experienced trembling (e.g., in the hands); I was worried about situations in which I might panic and make a fool of myself	.84	545
Stress Symptoms	Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995)	14 items; I found myself getting upset by quite trivial things; I tended to over-react to situations	.90	545

Note. $N_{\text{total cases}}$= 645. Parental Stress and Strain is a composite was created using confirmatory factor analysis.

Table 3. *Bivariate Correlations and Descriptive Statistics*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Sleep duration (age 10)	--																			
2. Sleep efficiency (age 10)	.50***	--																		
3. Sleep problems (age 10)	-.18***	-.09	--																	
4. Body fat percentage (age 10)	-.21***	-.12*	.10*	--																
5. Sleep duration (age 8)	.53***	.32***	-.05	-.15**	--															
6. Sleep efficiency (age 8)	.24***	.52***	-.00	-.11*	.65***	--														
7. Sleep problems (age 8)	-.16**	-.08	.65***	.13*	-.13**	-.01	--													
8. Body fat percentage (age 8)	-.13*	-.15**	.07	.85***	-.15***	-.13**	.10*	--												
9. Perceived neighborhood danger	.01	.08	.08	.12*	-.08	.04	.10*	.17***	--											
10. Child opportunities index	.12**	.05	-.12**	-.08	.15***	.06	-.15***	-.15***	-.31***	--										
11. Parental stress and strain	-.08	-.01	.20***	.05	-.10*	.00	.19***	.07	.22***	-.09*	--									
12. Positive parenting	.17**	.04	-.02	-.06	.14**	.02	-.08	-.13**	-.07	.12**	-.03	--								
13. Negative parenting	-.08	-.08	.08	.15**	-.07	-.07	.10*	.10*	.12**	-.06	.12*	-.10	--							
14. Familism *total* values	-.13*	-.06	-.00	.10	-.17***	-.01	.10*	.05	-.10*	-.03	-.05	-.05	.02	--						
15. Male	.06	.07	.00	.20***	.17***	.15***	.03	.19***	.03	-.03	-.09*	-.06	-.17***	-.00	--					
16. European descent	.16**	-.12**	-.05	-.15**	.11**	-.04	-.04	-.20***	-.23***	.28***	.06	.08*	-.02	-.07	-.05	--				
17. Latino descent	-.07	.11*	.05	.16***	-.07	.05	.08*	.19***	.17***	-.33***	-.05	-.07	.04	.09*	.03	-.77***	--			
18. Socioeconomic Status	.12**	.04	-.12**	-.14**	.10*	.03	-.15**	-.19***	-.30***	.46***	-.19**	.16**	-.20***	-.06	.06	.21***	-.26***	--		
19. Vacation status	.04	-.02	-.04	-.10*	-.02	.00	.09*	-.11*	.05	.08*	.00	-.09	.00	.05	.01	.02	-.03	.05	--	
20. Pandemic status	.11*	.05	-.03	.03	.02	.00	.00	-.04	-.06	.04	.04	.20***	.03	-.06	-.01	.09**	-.04	-.03	-.08*	--

Note. Age 8 wave $N = 703$. Age 10 wave $N = 780$. Positive and negative parenting were standardized mean composite of the parent-child challenge task and the parent-child discussion task. Male: 0 = male ($n = 451$), 1 = female ($N = 480$). European descent: 1 = White ($N = 513$), 0 = Non-White ($N = 398$); Latino descent: 1 = Latino and biracial child with Latino heritage ($N = 287$), 0 = non-Latino ($N = 624$). Socioeconomic status was standardized mean composite of family income-to-needs ratio, primary caregiver's education, and alternate caregiver's education. Vacation status during age 10 assessment: 1 = study week or first survey completed during vacation ($N = 229$), 0 = study week or first survey not completed during vacation ($N = 539$). Pandemic status during age 10 assessment: 1 = study week or first survey completed before March 16, 2020 ($N = 769$), 0 = study week or first survey completed after March 16, 2020 ($N = 164$).
*$p < .05$; **$p < .01$; ***$p < .001$.

Table 4. *Bayesian Estimates from Multilevel Models Predicting Health Outcomes*

	Sleep Duration (The age 10 wave)		**Sleep Efficiency (The age 10 wave)**	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	95% CI (L, U)
Family Level				
Intercept	**-0.376 (0.087)**	(-0.557, -0.216)	**0.193 (0.083)**	(0.028, 0.359)
r^2	**0.907 (0.073)**	(0.726, 0.989)	**0.731 (0.085)**	(0.578, 0.902)
Outcomes at age 8	**0.817 (0.048)**	(0.717, 0.902)	**0.791 (0.046)**	(0.697, 0.878)
Danger	0.111 (0.071)	(-0.027, 0.249)	0.085 (0.075)	(-0.063, 0.231)
COI	-0.015 (0.066)	(-0.137, 0.118)	0.040 (0.067)	(-0.091, 0.175)
European descent	**0.304 (0.090)**	(0.108, 0.458)	-0.010 (0.119)	(-0.246, 0.225)
Latino descent	**0.236 (0.099)**	(0.008, 0.400)	0.147 (0.123)	(-0.098, 0.384)
Socioeconomic status	0.086 (0.068)	(-0.047, 0.223)	0.075 (0.068)	(-0.059, 0.209)
Vacation status	0.081 (0.070)	(-0.059, 0.214)	0.011 (0.074)	(-0.140, 0.151)
Pandemic status	0.121 (0.090)	(-0.051, 0.294)	0.120 (0.095)	(-0.067, 0.308)
Individual level				
r^2	**0.111 (0.045)**	(0.038, 0.214)	**0.731 (0.085)**	(0.578, 0.902)
Outcomes at age 8	**0.329 (0.070)**	(0.183, 0.459)	**0.279 (0.080)**	(0.113, 0.424)
Gender	0.020 (0.052)	(-0.081, 0.121)	0.031 (0.055)	(-0.077, 0.137)

	Sleep Problems (The age 10 wave)		**Body Fat Percentage (The age 10 wave)**	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	Estimate (Post. SD)
Family Level				
Intercept	**-0.137 (0.055)**	(-0.246, -0.03)	0.160 (0.092)	(-0.038, 0.321)
r^2	**0.672 (0.041)**	(0.591, 0.754)	**0.795 (0.066)**	(0.674, 0.933)
Outcomes at age 8	**0.797 (0.026)**	(0.745, 0.845)	**0.832 (0.032)**	(0.761, 0.889)
Danger	-0.026 (0.054)	(-0.131, 0.080)	-0.021 (0.057)	(-0.131, 0.092)
COI	-0.029 (0.050)	(-0.127, 0.071)	0.051 (0.054)	(-0.054, 0.158)
European descent	-0.017 (0.078)	(-0.169, 0.137)	-0.056 (0.084)	(-0.226, 0.104)
Latino descent	-0.047 (0.081)	(-0.203, 0.113)	0.069 (0.087)	(-0.099, 0.244)
Socioeconomic status	-0.001 (0.048)	(-0.097, 0.092)	-0.040 (0.056)	(-0.150, 0.069)
Vacation status	-0.039 (0.053)	(-0.143, 0.067)	-0.013 (0.058)	(-0.129, 0.100)
Pandemic status	-0.072 (0.054)	(-0.176, 0.033)	0.175 (0.220)	(-0.337, 0.479)
Individual level				
r^2	**0.311 (0.051)**	(0.211, 0.409)	**0.685 (0.037)**	(0.605, 0.750)
Outcomes at age 8	**0.555 (0.046)**	(0.456, 0.637)	**0.821 (0.024)**	(0.768, 0.862)
Gender	-0.022 (0.046)	(-0.111, 0.068)	**0.099 (0.040)**	(0.022, 0.177)

Note. N = 933. Presented are standardized model coefficients. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter. 95% CI (L, U) = 95% credible interval (lower, upper). Bayesian 95% credibility interval (CI) was examined such that if the estimates do not include zero (Asparouhov & Muthén, 2010, p. 7).

Table 5. *Post Hoc Analyses: Direct Effects of Neighborhood Conditions on Sleep and Weight Health Without Controlling for The age 8 wave Health*

	Sleep Duration (The age 10 wave)		**Sleep Efficiency (The age 10 wave)**	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	95% CI (L, U)
Family Level				
Intercept	**16.241 (1.563)**	(13.713, 19.775)	**22.576 (1.689)**	(19.658, 26.33)
r^2	**0.543 (0.181)**	(0.210, 0.900)	**0.187 (0.084)**	(0.067, 0.395)
Danger	0.180 (0.097)	(-0.021, 0.357)	0.144 (0.094)	(-0.048, 0.322)
COI	0.110 (0.085)	(-0.059, 0.274)	0.129 (0.084)	(-0.039, 0.289)
European descent	0.153 (0.086)	(-0.018, 0.319)	-0.099 (0.140)	(-0.371, 0.174)
Latino descent	0.486 (0.122)	(0.208, 0.680)	0.161 (0.145)	(-0.129, 0.435)
Socioeconomic status	0.352 (0.127)	(0.078, 0.562)	0.083 (0.083)	(-0.078, 0.249)
Vacation status	0.032 (0.089)	(-0.142, 0.208)	-0.060 (0.092)	(-0.238, 0.122)
Pandemic status	0.246 (0.118)	(0.009, 0.474)	0.170 (0.124)	(-0.082, 0.412)
Individual level				
r^2	**0.009 (0.011)**	(0.000, 0.039)	**0.009 (0.012)**	(0.000, 0.042)
Gender	0.092 (0.054)	(-0.015, 0.197)	0.094 (0.057)	(-0.021, 0.205)
	Sleep Problems (The age 10 wave)		**Body Fat Percentage (The age 10 wave)**	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	Estimate (Post. SD)
Family Level				
Intercept	**6.099 (0.314)**	(5.515, 6.751)	**3.035 (0.315)**	(2.333, 3.578)
r^2	**0.0760 (0.04)**	(0.026, 0.180)	**0.260 (0.255)**	(0.067, 0.936)
Danger	0.022 (0.086)	(-0.145, 0.191)	0.143 (0.101)	(-0.065, 0.328)
COI	-0.103 (0.072)	(-0.244, 0.039)	0.001 (0.077)	(-0.154, 0.147)
European descent	0.007 (0.110)	(-0.207, 0.221)	-0.055 (0.126)	(-0.300, 0.190)
Latino descent	0.015 (0.116)	(-0.212, 0.240)	0.177 (0.126)	(-0.077, 0.413)
Socioeconomic status	-0.104 (0.066)	(-0.234, 0.026)	-0.155 (0.086)	(-0.32, 0.021)
Vacation status	0.070 (0.073)	(-0.073, 0.213)	-0.139 (0.428)	(-0.91, 0.516)
Pandemic status	-0.047 (0.075)	(-0.192, 0.099)	3.035 (0.315)	(2.333, 3.578)
Individual level				
r^2	**0.001 (0.004)**	(0.000, 0.015)	**0.107 (0.037)**	(0.045, 0.186)
Gender	-0.012 (0.053)	(-0.119, 0.09)	**0.327 (0.056)**	(0.212, 0.431)

Note. N = 933. Presented are standardized model coefficients. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter. 95% CI (L, U) = 95% credible interval (lower, upper). Bayesian 95% credibility interval (CI) was examined such that if the estimates do not include zero (Asparouhov & Muthén, 2010, p. 7).

Table 6. *Post Hoc Cross-Sectional Analyses: Direct Effects of Neighborhood Conditions on Sleep and Weight Health.*

	Sleep Duration (The age 8 wave)		Sleep Efficiency (The age 8 wave)	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	95% CI (L, U)
Family Level				
Intercept	**13.538 (2.913)**	(10.823, 21.441)	**21.002 (6.840)**	(16.031, 41.635)
r^2	**0.269 (0.184)**	(0.063, 0.746)	**0.139 (0.133)**	(0.036, 0.531)
Danger	0.020 (0.065)	(-0.108, 0.149)	0.110 (0.077)	(-0.016, 0.293)
COI	0.112 (0.066)	(-0.004, 0.258)	0.082 (0.077)	(-0.048, 0.258)
European descent	**0.383 (0.149)**	(0.098, 0.684)	-0.052 (0.163)	(-0.384, 0.272)
Latino descent	0.220 (0.148)	(-0.080, 0.500)	0.126 (0.181)	(-0.197, 0.517)
Socioeconomic status	**0.161 (0.071)**	(0.037, 0.321)	**0.151 (0.085)**	(0.015, 0.357)
Vacation status	-0.041 (0.099)	(-0.241, 0.152)	-0.136 (0.120)	(-0.416, 0.073)
Individual level				
r^2	**0.091 (0.226)**	(0.020, 0.882)	**0.049 (0.120)**	(0.007, 0.490)
Gender	**0.301 (0.212)**	(0.142, 0.939)	**0.222 (0.148)**	(0.084, 0.700)

	Sleep Problems (The age 8 wave)		Body Fat Percentage (The age 8 wave)	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	Estimate (Post. SD)
Family Level				
Intercept	**6.576 (3.490)**	(4.992, 16.97)	**4.285 (1.915)**	(3.075, 9.888)
r^2	**0.180 (0.243)**	(0.047, 0.956)	**0.246 (0.269)**	(0.074, 0.956)
Danger	0.081 (0.094)	(-0.094, 0.308)	0.145 (0.098)	(-0.009, 0.381)
COI	-0.082 (0.079)	(-0.269, 0.053)	-0.055 (0.098)	(-0.312, 0.097)
European descent	0.163 (0.178)	(-0.127, 0.587)	**-0.366 (0.219)**	(-0.821, -0.008)
Latino descent	0.125 (0.177)	(-0.215, 0.503)	0.115 (0.189)	(-0.283, 0.490)
Socioeconomic status	**-0.200 (0.155)**	(-0.732, -0.070)	-0.120 (0.098)	(-0.384, 0.036)
Vacation status	-0.162 (0.130)	(-0.466, 0.061)	0.071 (0.149)	(-0.172, 0.453)
Individual level				
r^2	**0.091 (0.226)**	(0.020, 0.882)	**0.064 (0.065)**	(0.019, 0.268)
Gender	**0.301 (0.212)**	(0.142, 0.939)	**0.252 (0.098)**	(0.136, 0.518)

Note. N = 697. Presented are standardized model coefficients. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter. 95% CI (L, U) = 95% credible interval (lower, upper). Bayesian 95% credibility interval (CI) was examined such that if the estimates do not include zero (Asparouhov & Muthén, 2010, p. 7). All the variables in this post-hoc analyses were reports from the age 8 wave.

Table 7. *Post Hoc Analyses: Direct Effects of Neighborhood Conditions on Sleep and Weight Health Without Controlling for The age 8 wave Health and Socioeconomic Status*

	Sleep Duration (The age 10 wave)		**Sleep Efficiency (The age 10 wave)**	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	95% CI (L, U)
Family Level				
Intercept	**16.359 (1.555)**	(13.77, 19.821)	**22.759 (1.734)**	(19.839, 26.64)
r^2	**0.600 (0.216)**	(0.203, 0.971)	**0.177 (0.086)**	(0.057, 0.392)
Danger	0.175 (0.098)	(-0.022, 0.348)	0.137 (0.096)	(-0.063, 0.315)
COI	**0.170 (0.078)**	(0.014, 0.323)	**0.160 (0.077)**	(0.004, 0.304)
European descent	**0.536 (0.138)**	(0.229, 0.757)	-0.101 (0.148)	(-0.396, 0.178)
Latino descent	**0.369 (0.140)**	(0.047, 0.584)	0.143 (0.149)	(-0.155, 0.428)
Vacation status	0.027 (0.095)	(-0.167, 0.211)	-0.055 (0.093)	(-0.235, 0.129)
Pandemic status	0.228 (0.131)	(-0.004, 0.498)	0.170 (0.125)	(-0.078, 0.412)
Individual level				
r^2	**0.010 (0.012)**	(0.000, 0.043)	**0.010 (0.012)**	(0.000, 0.044)
Gender	0.100 (0.055)	(-0.008, 0.208)	0.099 (0.057)	(-0.015, 0.209)
	Sleep Problems (The age 10 wave)		**Body Fat Percentage (The age 10 wave)**	
	Estimate (Post. SD)	95% CI (L, U)	Estimate (Post. SD)	Estimate (Post. SD)
Family Level				
Intercept	**6.100 (0.316)**	(5.519, 6.755)	**3.035 (0.315)**	(2.333, 3.578)
r^2	**0.070 (0.042)**	(0.021, 0.183)	**0.260 (0.255)**	(0.067, 0.936)
Danger	0.039 (0.088)	(-0.135, 0.212)	0.143 (0.101)	(-0.065, 0.328)
COI	**-0.147 (0.068)**	(-0.276, -0.011)	0.001 (0.077)	(-0.154, 0.147)
European descent	**0.008 (0.112)**	(-0.208, 0.232)	-0.055 (0.126)	(-0.300, 0.190)
Latino descent	0.029 (0.114)	(-0.194, 0.255)	0.177 (0.126)	(-0.077, 0.413)
Vacation status	0.068 (0.073)	(-0.077, 0.209)	-0.155 (0.086)	(-0.320, 0.021)
Pandemic status	-0.040 (0.074)	(-0.186, 0.105)	-0.139 (0.428)	(-0.910, 0.516)
Individual level				
r^2	**0.001 (0.004)**	(0.000, 0.015)	**0.107 (0.037)**	(0.045, 0.186)
Gender	-0.017 (0.052)	(-0.120, 0.085)	**0.327 (0.056)**	(0.212, 0.431)

Note. N = 933. Presented are standardized model coefficients. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter. 95% CI (L, U) = 95% credible interval (lower, upper). Bayesian 95% credibility interval (CI) was examined such that if the estimates do not include zero (Asparouhov & Muthén, 2010, p. 7).

Table 8. *Results from Bayesian Multilevel Mediation Models*

Model Path				**Estimate (Post SD)**	**95% CI (Lower, Upper)**	**Figure 1 Path**
Aim 2a: Danger → PSS → Health Outcomes						
Family Level						
r^2				**0.505 (0.208)**	(0.121, 0.922)	1be1
Intercept				**-0.438 (0.132)**	(-0.704, -0.184)	
Danger			→ Duration	0.144 (0.103)	(-0.060, 0.342)	
Danger	**→PSS**			**0.208 (0.057)**	(0.097, 0.319)	
PSS			→ Duration	0.094 (0.117)	(-0.138, 0.316)	
Danger	→ PSS		→ Duration	0.01 (0.015)	(-0.018, 0.041)	
r^2				**0.729 (0.078)**	(0.584, 0.887)	1be2
Intercept				**0.188 (0.083)**	(0.019, 0.349)	
Danger			→ Efficiency	0.022 (0.076)	(-0.125, 0.168)	
Danger	**→PSS**			**0.291 (0.060)**	(0.172, 0.406)	
PSS			**→ Efficiency**	**0.166 (0.078)**	(0.007, 0.312)	
Danger	**→ PSS**		**→ Efficiency**	**0.292 (0.161)**	(0.003, 0.634)	
PSS		→NegParent		0.134 (0.075)	(-0.014, 0.281)	1bcd2
NegParent			→ Efficiency	-0.032 (0.100)	(-0.223, 0.172)	
Danger	→ PSS	→NegParent	→ Efficiency	-0.003 (0.021)	(-0.052, 0.038)	
r^2				**0.091 (0.060)**	(0.014, 0.226)	1be3
Intercept				**-0.180 (0.084)**	(-0.342, -0.011)	
Danger			→ Problems	-0.076 (0.085)	(-0.244, 0.087)	
Danger	**→PSS**			**0.207 (0.056)**	(0.094, 0.316)	
PSS			→ Problems	0.080 (0.082)	(-0.078, 0.243)	
Danger	→ PSS		→ Problems	0.005 (0.006)	(-0.005, 0.017)	
r^2				**0.791 (0.07)**	(0.666, 0.938)	1be4
Intercept				0.162 (0.092)	(-0.032, 0.334)	
Danger			→ BFP	-0.027 (0.059)	(-0.144, 0.089)	
Danger	**→PSS**			**0.206 (0.057)**	(0.094, 0.315)	
PSS			→ BFP	-0.018 (0.060)	(-0.138, 0.099)	
Danger	→ PSS		→ BFP	-0.026 (0.103)	(-0.236, 0.18)	
Aim 2b: COI → PSS → Health Outcomes						
Family Level						
r^2				**0.446 (0.207)**	(0.075, 0.847)	2be1
Intercept				**-0.458 (0.129)**	(-0.720, -0.220)	
COI			→ Duration	-0.082 (0.097)	(-0.274, 0.108)	
COI	→PSS			-0.058 (0.060)	(-0.176, 0.058)	
PSS			→ Duration	0.137 (0.123)	(-0.102, 0.383)	
COI	→ PSS		→ Duration	-0.001 (0.004)	(-0.011, 0.004)	
r^2				**0.713 (0.081)**	(0.560, 0.884)	2be2
Intercept				**0.195 (0.085)**	(0.029, 0.362)	
COI			→ Efficiency	0.028 (0.067)	(-0.104, 0.158)	
COI	→PSS			-0.059 (0.061)	(-0.179, 0.058)	
PSS			→ Efficiency	0.043 (0.069)	(-0.097, 0.174)	
COI	→ PSS		→ Efficiency	-0.004 (0.021)	(-0.058, 0.029)	
r^2				**0.674 (0.042)**	(0.591, 0.754)	2be3
Intercept				**-0.140 (0.055)**	(-0.247, -0.032)	
COI			→ Problems	-0.020 (0.050)	(-0.121, 0.075)	
COI	→PSS			-0.061 (0.060)	(-0.178, 0.058)	
PSS			→ Problems	0.062 (0.051)	(-0.038, 0.160)	
COI	→ PSS		→ Problems	-0.001 (0.001)	(-0.004, 0.001)	
r^2				**0.780 (0.070)**	(0.659, 0.938)	2be4
Intercept				0.137 (0.098)	(-0.038, 0.348)	
COI			→ BFP	0.056 (0.055)	(-0.053, 0.167)	
COI	→PSS			-0.060 (0.060)	(-0.181, 0.054)	
PSS			→ BFP	-0.016 (0.057)	(-0.131, 0.090)	
COI	→ PSS		→ BFP	0.002 (0.021)	(-0.035, 0.053)	

Note. N = 933. Presented are standardized model coefficients. All models included the following variables as covariates: gender, European descent, Latino descent, socioeconomic status, vacation status, pandemic status. All models included the baseline health measure to control for the effects of age 8 health. BPF =body fat percentage, COI = childhood opportunity index, PSS = parental stress and strain, NegParent = negative parenting. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter.

Table 9. *Bayesian Multilevel Moderation Models*

	Sleep Duration		Sleep Efficiency		Sleep Problem		Body Fat Percentage		PSS	
	Estimate (Post. SD)	95% CI (Lower, Upper)	Estimate (Post. SD)	95% CI (Lower, Upper)	Estimate (Post. SD)	95% CI (Lower, Upper)	Estimate (Post. SD)	95% CI (Lower, Upper)	Estimate (Post. SD)	95% CI (Lower, Upper)
Aim 3a: path 1ax, Figure 1										
r^2	**0.515 (0.198)**	(0.141, 0.873)	**0.345 (0.169)**	(0.084, 0.709)	**0.130 (0.084)**	(0.033, 0.360)	**0.349 (0.237)**	(0.066, 0.874)	--	--
Intercept	-0.263 (0.145)	(-0.556, 0.018)	0.342 (0.254)	(-0.152, 0.852)	**-0.302 (0.100)**	(-0.505, -0.113)	0.223 (0.205)	(-0.189, 0.592)	--	--
Danger	0.085 (0.113)	(-0.138, 0.308)	-0.016 (0.105)	(-0.210, 0.194)	-0.027 (0.087)	(-0.197, 0.146)	-0.036 (0.110)	(-0.243, 0.189)	--	--
PosParent (between)	0.064 (0.137)	(-0.206, 0.335)	0.42 (0.261)	(-0.225, 0.772)	-0.050 (0.108)	(-0.259, 0.160)	-0.027 (0.135)	(-0.288, 0.245)	--	--
PosParent (within)	-0.038 (0.041)	(-0.124, 0.037)	-0.07 (0.041)	(-0.156, 0.008)	**0.104 (0.033)**	(0.044, 0.169)	0.014 (0.040)	(-0.074, 0.086)	--	--
Danger x PosParent	0.053 (0.191)	(-0.288, 0.486)	-0.179 (0.134)	(-0.369, 0.154)	-0.023 (0.169)	(-0.345, 0.300)	0.024 (0.184)	(-0.293, 0.435)	--	--
Cross-Level x	-0.266 (0.183)	(-0.541, 0.150)	-0.384 (0.481)	(-0.867, 0.711)	-0.058 (0.064)	(-0.172, 0.071)	0.328 (0.657)	(-0.921, 0.956)	--	--
Aim 3b: path 2ax, Figure 1										
r^2	**0.461 (0.196)**	(0.142, 0.87)	**0.176 (0.105)**	(0.046, 0.442)	**0.103 (0.070)**	(0.025, 0.299)	**0.162 (0.071)**	(0.067, 0.339)	--	--
Intercept	**-0.495 (0.144)**	(-0.821, -0.243)	**0.344 (0.122)**	(0.123, 0.613)	-0.184 (0.087)	(-0.351, -0.015)	**3.317 (0.253)**	(2.842, 3.828)	--	--
COI	-0.103 (0.099)	(-0.301, 0.09)	0.002 (0.095)	(-0.178, 0.192)	-0.040 (0.077)	(-0.188, 0.116)	0.039 (0.089)	(-0.137, 0.212)	--	--
PosParent (between)	0.122 (0.143)	(-0.169, 0.387)	0.078 (0.136)	(-0.185, 0.344)	-0.050 (0.099)	(-0.249, 0.133)	-0.119 (0.118)	(-0.374, 0.091)	--	--
PosParent (within)	**-0.117 (0.046)**	(-0.219, -0.02)	-0.088 (0.043)	(-0.164, 0.003)	0.051 (0.032)	(-0.018, 0.107)	0.104 (0.073)	(-0.028, 0.254)	--	--
COI x PosParent	0.007 (0.149)	(-0.271, 0.314)	0.15 (0.138)	(-0.121, 0.423)	-0.029 (0.087)	(-0.197, 0.137)	**0.319 (0.109)**	(0.103, 0.543)	--	--
Cross-Level x	0.072 (0.102)	(-0.158, 0.246)	0.242 (0.536)	(-0.777, 0.895)	-0.017 (0.030)	(-0.074, 0.043)	-0.843 (0.311)	(-0.964, 0.329)	--	--
Aim3c: path 2ay, Figure 1										
r^2	**0.568 (0.196)**	(0.212, 0.935)	**0.184 (0.117)**	(0.047, 0.514)	**0.137 (0.087)**	(0.034, 0.370)	**0.223 (0.109)**	(0.075, 0.495)	--	--
Intercept	-0.293 (0.156)	(-0.616, 0.003)	**0.377 (0.152)**	(0.100, 0.692)	**-0.281 (0.103)**	(-0.492, -0.088)	**3.619 (0.367)**	(2.973, 4.439)	--	--
Danger	0.139 (0.131)	(-0.118, 0.398)	0.091 (0.133)	(-0.156, 0.376)	-0.020 (0.089)	(-0.196, 0.151)	0.057 (0.116)	(-0.162, 0.291)	--	--
NegParent (between)	**-0.316 (0.144)**	(-0.605, -0.04)	-0.049 (0.139)	(-0.320, 0.227)	-0.074 (0.121)	(-0.296, 0.178)	0.174 (0.150)	(-0.129, 0.456)	--	--
NegParent (within)	0.053 (0.050)	(-0.050, 0.152)	-0.015 (0.051)	(-0.112, 0.084)	-0.040 (0.033)	(-0.101, 0.026)	0.110 (0.068)	(-0.024, 0.250)	--	--
Danger x NegParent	**-0.356 (0.178)**	(-0.769, -0.048)	**-0.374 (0.177)**	(-0.786, -0.090)	0.150 (0.148)	(-0.141, 0.438)	0.225 (0.159)	(-0.060, 0.564)	--	--
Cross-Level x	0.061 (0.198)	(-0.306, 0.455)	0.336 (0.717)	(-0.957, 0.971)	-0.081 (0.071)	(-0.205, 0.075)	-0.883 (0.638)	(-0.987, 0.939)	--	--
Aim 3d: path 2ay, Figure 1										
r^2	**0.561 (0.197)**	(0.183, 0.924)	**0.195 (0.123)**	(0.053, 0.534)	**0.112 (0.079)**	(0.028, 0.335)	**0.238 (0.096)**	(0.091, 0.460)	--	--
Intercept	**-0.480 (0.155)**	(-0.825, -0.218)	**0.355 (0.124)**	(0.131, 0.611)	**-0.173 (0.087)**	(-0.345, -0.002)	**3.291 (0.255)**	(2.835, 3.838)	--	--
COI	-0.073 (0.100)	(-0.270, 0.119)	0.008 (0.094)	(-0.177, 0.191)	-0.042 (0.077)	(-0.190, 0.110)	0.044 (0.081)	(-0.119, 0.201)	--	--
NegParent (between)	**-0.283 (0.141)**	(-0.547, -0.001)	-0.116 (0.137)	(-0.391, 0.146)	-0.082 (0.112)	(-0.322, 0.116)	**0.311 (0.129)**	(0.020, 0.529)	--	--
NegParent (within)	0.043 (0.038)	(-0.037, 0.11)	0.015 (0.044)	(-0.073, 0.104)	-0.013 (0.030)	(-0.065, 0.051)	0.096 (0.078)	(-0.057, 0.254)	--	--
COI x NegParent	0.247 (0.141)	(-0.011, 0.542)	0.120 (0.130)	(-0.111, 0.409)	-0.039 (0.101)	(-0.255, 0.136)	0.095 (0.109)	(-0.108, 0.319)	--	--
Cross-Level x	0.067 (0.096)	(-0.136, 0.237)	0.289 (0.496)	(-0.818, 0.866)	0.038 (0.031)	(-0.026, 0.095)	0.906 (0.269)	(-0.090, 0.974)	--	--
Aim 4a: path 1az, Figure 1										
r^2	--	--	--	--	--	--	--	--	**0.181 (0.082)**	(0.066, 0.377)
Intercept	--	--	--	--	--	--	--	--	0.184 (0.463)	(-0.408, 1.165)
Danger	--	--	--	--	--	--	--	--	-0.054 (0.099)	(-0.248, 0.141)
Familism	--	--	--	--	--	--	--	--	**0.257 (0.111)**	(0.032, 0.460)
Danger x Familism	--	--	--	--	--	--	--	--	-0.071 (0.102)	(-0.271, 0.127)
Aim 4b: path 2az, Figure 1										
r^2	--	--	--	--	--	--	--	--	**0.204 (0.128)**	(0.065, 0.588)
Intercept	--	--	--	--	--	--	--	--	0.290 (1.139)	(-0.324, 3.359)
COI	--	--	--	--	--	--	--	--	-0.136 (0.096)	(-0.318, 0.055)
Familism	--	--	--	--	--	--	--	--	-0.067 (0.105)	(-0.271, 0.141)
COI x Familism	--	--	--	--	--	--	--	--	**0.208 (0.096)**	(0.010, 0.387)

Note. N = 869. The moderation of familism within the association between neighborhood dimensions and parental stress and strain was conducted using a sub-sample (Latino-descent only; N = 287) in response to measurement invariance poor model fit at the configural level. Presented are standardized model coefficients. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter. Cross level x = cross level interaction, PSS = parent stress and strain, PosParent = positive parenting, NegParent = negative parenting, 95% CI (L, U) = 95% credible interval (lower, upper), CLI = cross level interaction, BLI = between level interaction (only in family-level). All models included the following variables as covariates: gender, European descent, Latino descent, socioeconomic status, vacation status, pandemic status.

Table 10. *Bayesian Multilevel Moderated Mediation Models*

	Sleep Efficiency at Age 10	
	Estimate (Post. SD)	95% CI (Lower, Upper)
Aim 3e (exploratory): path 1bwe, Figure 1		
r^2	**0.271 (0.139)**	(0.071, 0.586)
Intercept	**0.394 (0.155)**	(0.096, 0.704)
Danger	-0.106 (0.117)	(-0.331, 0.126)
PSS	**0.261 (0.118)**	(0.033, 0.496)
PosParent (between)	0.075 (0.151)	(-0.231, 0.361)
PosParent (within)	**-0.090 (0.047)**	(-0.194, -0.006)
PSS x PosParent	0.036 (0.150)	(-0.257, 0.328)
Cross-Level x	-0.828 (0.521)	(-0.986, 0.717)
2nd Stage Mod-Med	0.080 (0.360)	(-0.607, 0.825)

Aim 3f (exploratory): path 2bwe, Figure 1. Analysis not conducted as no significant mediation was found (see Table 5, Aims 2b)

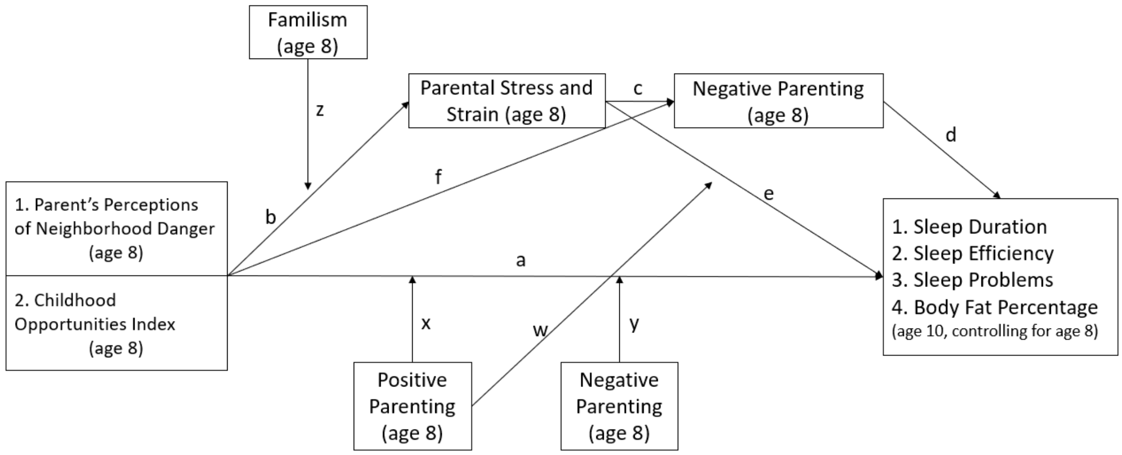
Aim 4c (exploratory): path 1bze, Figure 1. Analysis not conducted since there was not significant moderation found (see Table 6, Aim 4a)

Aim 4d (exploratory): path 2bze, Figure 1.

	Sleep Duration at Age 10		Sleep Efficiency at Age 10	
	Estimate (Post. SD)		95% CI (Lower, Upper)	
r^2	**0.864 (0.085)**	(0.696, 0.992)	**0.708 (0.112)**	(0.510, 0.944)
Intercept	-0.247 (0.135)	(-0.514, 0.014)	0.214 (0.149)	(-0.073, 0.509)
COI	-0.109 (0.103)	(-0.307, 0.097)	-0.085 (0.118)	(-0.309, 0.151)
Familism	0.134 (0.049)	(0.037, 0.228)	0.071 (0.056)	(-0.039, 0.179)
PSS	0.259 (0.095)	(0.069, 0.439)	0.139 (0.108)	(-0.075, 0.345)
COI x Familism → PSS	0.075 (0.123)	(-0.164, 0.315)	0.074 (0.123)	(-0.162, 0.319)
1st stage Mod-Med	0.016 (0.035)	(-0.048, 0.094)	0.042 (0.172)	(-0.249, 0.474)
	Sleep Problems at Age 10		**Body Fat Percentage at Age 10**	
	Estimate (Post. SD)		95% CI (Lower, Upper)	
r^2	**0.740 (0.109)**	(0.533, 0.945)	**0.783 (0.137)**	(0.539, 1.000)
Intercept	-0.118 (0.120)	(-0.354, 0.113)	0.037 (0.165)	(-0.268, 0.377)
COI	0.101 (0.104)	(-0.101, 0.302)	0.009 (0.109)	(-0.205, 0.218)
Familism	-0.049 (0.057)	(-0.163, 0.061)	-0.058 (0.059)	(-0.174, 0.060)
PSS	-0.095 (0.110)	(-0.312, 0.117)	-0.113 (0.114)	(-0.341, 0.110)
COI x Familism → PSS	0.032 (0.128)	(-0.216, 0.280)	0.072 (0.125)	(-0.175, 0.311)
1st stage Mod-Med	0.000 (0.009)	(-0.019, 0.019)	-0.031 (0.175)	(-0.458, 0.258)

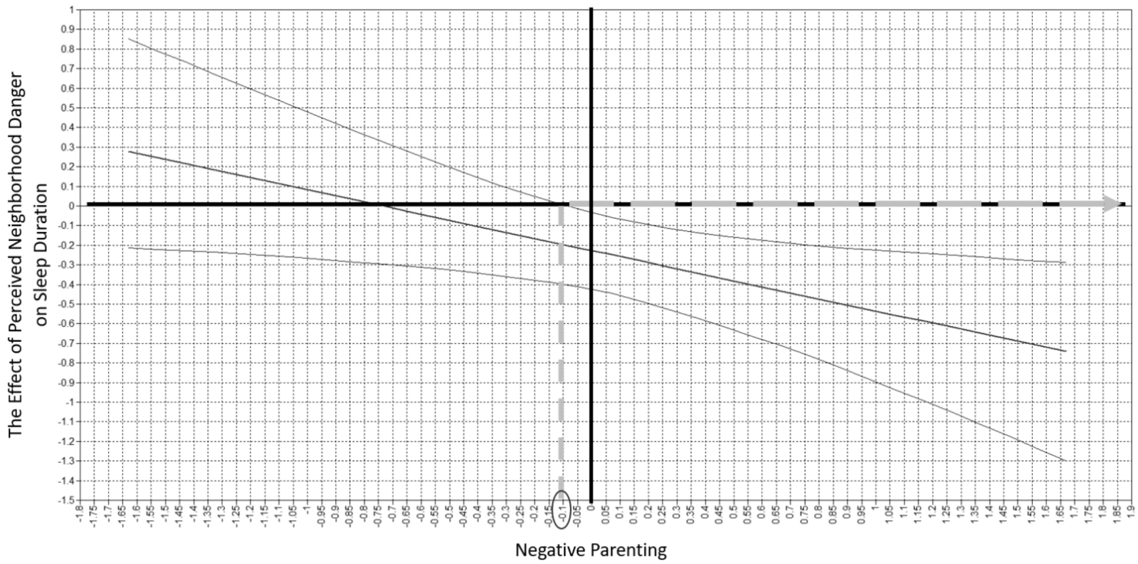
Note. Aim3e N = 740. Aim 4d N = 148. A subsample (Latino-descent only) was used to examine the first stage moderated mediation due to the results of the measurement invariance of familism cultural values scale. Of the 193 Latino-descent only sample, 45 participants were missing all sleep and weight health outcomes at the age 10 wave, these participants were not included in the final analyses. Presented are standardized model coefficients. Post. SD = posterior standard deviation; marginal posterior distribution for a parameter. PSS = parent stress and strain, PosParent = positive parenting, 95% CI (L, U) = 95% credible interval (lower, upper), CLI = cross level interaction, BLI = between level interaction (only in family-level). Aim 4d was conducted with a subsample (Latino-descent only; N = 287) in response to measurement invariance poor model fit at the configural level

Figure 1. *Major Framework for Dissertation*



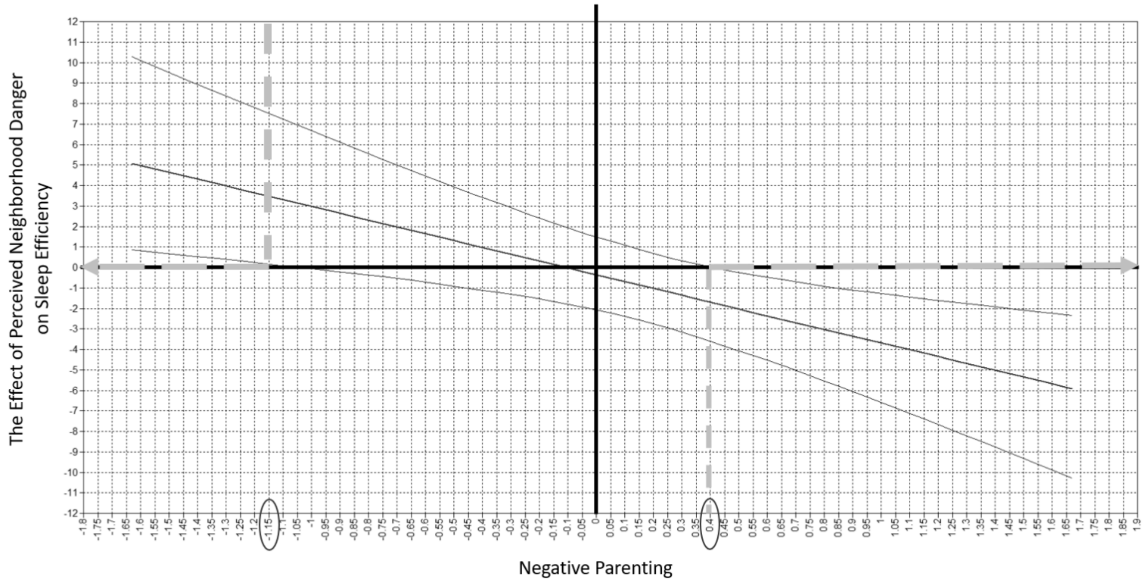
Note. The final dissertation model was framed using the family stress model, contextual relevance model, and the integrated model (Conger & Conger, 2002; Roche & Leventhal, 2009; White, Roosa, & Zeiders, 2012).

Figure 2. *Johnson-Neyman Plot: Regions of Significance of the Perceived Neighborhood Danger x Negative Parenting on Sleep Duration*



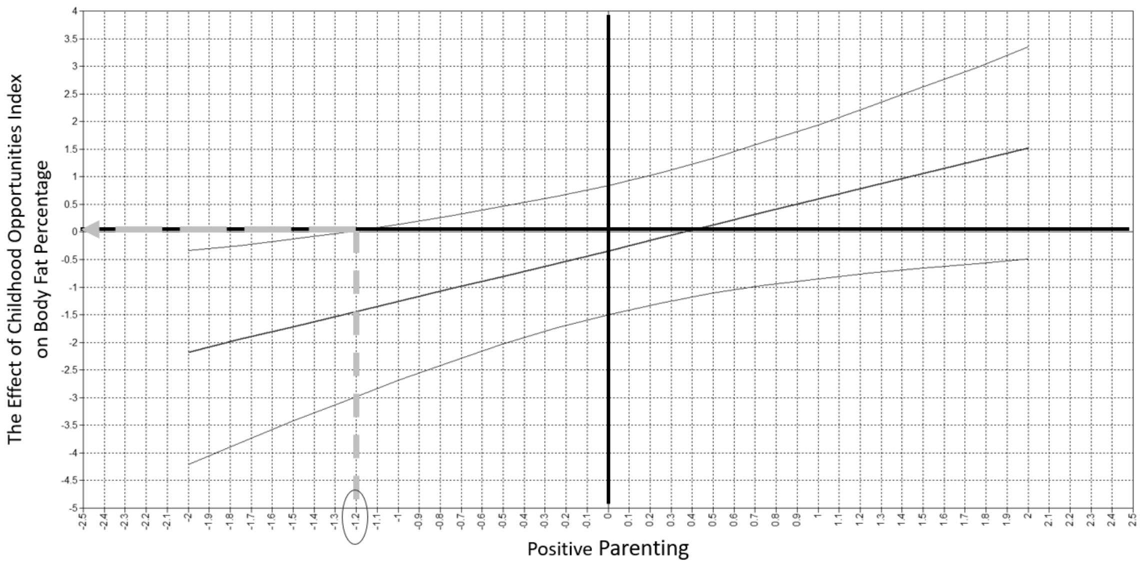
Note. The effect of perceived neighborhood danger on sleep duration was significantly negative for families with average and higher levels of negative parenting. The effect of perceived neighborhood danger on sleep duration was not significantly associated for families with lower levels of negative parenting (.1 standard deviations below the average).

Figure 3. *Johnson-Neyman Plot: Regions of Significance of the Perceived Neighborhood Danger x Negative Parenting on Sleep Efficiency*



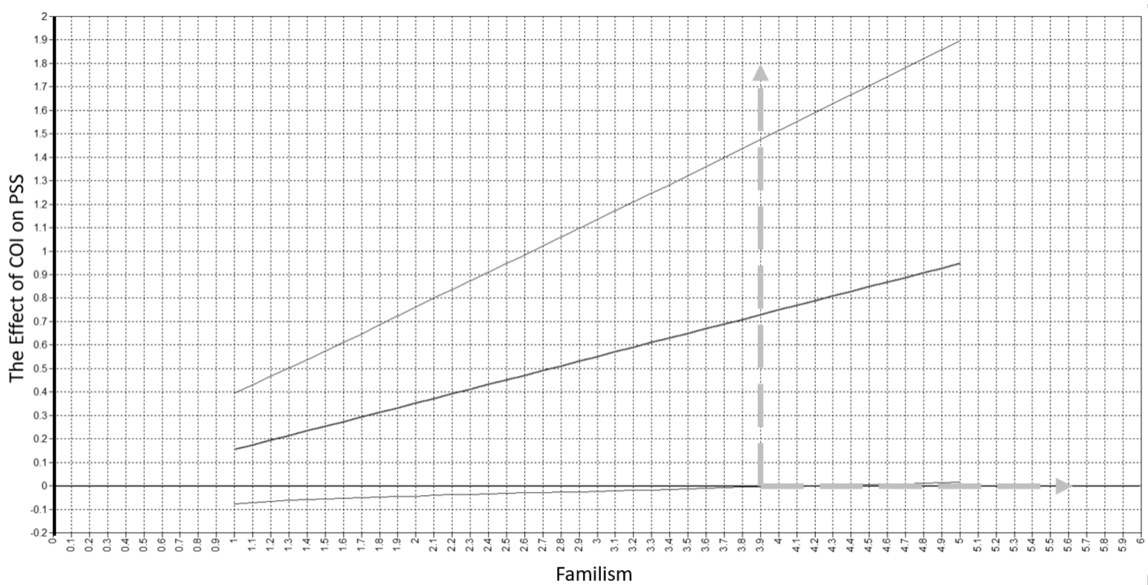
Note. The effect of perceived neighborhood danger on the sleep efficiency was significantly, positively associated among families with lower levels of negative parenting (lower than 1.15 standard deviations below the average). Conversely, families with higher levels of negative parenting (greater than .4 standard deviations above the average) showed significantly more *negative* associations between perceived neighborhood danger and sleep efficiency.

Figure 4. *Johnson-Neyman Plot: Regions of Significance of the COI x Positive Parenting on Body Fat Percentage*



Note. The effect of childhood opportunities on the body fat percentage was not associated in families with average to high levels of positive parenting. Whereas the effect of childhood opportunities on the body fat percentage was negatively associated among families with lower levels of positive parenting (lower than 1.2 standard deviations below the average).

Figure 5. *Johnson-Neyman Plot: Regions of Significance of the COI x Familism on Parental Stress and Strain*



Note. The effect of childhood opportunities on parental stress and strain was tested only among the Latino-descent sample due to the results of the measurement invariance. (*N* = 287). Participants who were missing all three of the key variables (i.e., perceived family danger, familism, PSS) were deleted from the analyses. The final sample size was *N* = 193