

An Examination of the Role of Health Behaviors in the Relation between Neighborhood
Disadvantage and Internalizing Symptoms among Latino Adolescents

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Abstract

Although research suggests that Latino adolescents report a high rate of internalizing symptoms, little is known about contextual factors, such as neighborhood disadvantage, that influence the development of these symptoms among this growing population of youth. In addition, research is warranted to examine factors that may buffer the relation between neighborhood disadvantage and internalizing symptoms in order to inform intervention efforts. This study examined the role of neighborhood disadvantage in predicting symptoms of anxiety and depression, and the buffering role of health behaviors, among a sample of 144 Latino youth ($N = 78$ males, Mean age = 16.25, $SD = 1.46$) attending a charter high school in a large, Midwestern city. Findings from path models indicated that neighborhood disadvantage was significantly related to symptoms of anxiety ($B = .26, p = .001$) but not depression ($B = .06, p = .48$). Further, a trend towards significance was found in the interaction between neighborhood disadvantage and sleep problems in predicting symptoms of depression ($B = .13, p = .08$), suggesting that symptoms of depression were highest for those with both high levels of neighborhood disadvantage and high sleep problems. Findings from this study suggest that neighborhood disadvantage is important to consider when identifying Latino adolescents at risk for anxiety symptoms. Further, interventions that address sleep problems, particularly for those residing in disadvantaged neighborhoods, may aid in preventing or reducing depressive symptoms among this population of youth.

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Table of Contents

Abstract.....	iii
Acknowledgements.....	iv
Table of Contents.....	v
List of Tables.....	vii
List of Figures.....	viii
Introduction.....	1
Overview.....	1
Neighborhood Disadvantage and Internalizing Symptoms.....	2
Buffering Effects of Health Behaviors.....	6
Physical Activity.....	7
Sleep.....	9
Diet.....	11
Present Study.....	12
Methods.....	13
Participants.....	13
Procedures.....	15

Measures.....	15
Results.....	19
Descriptive Statistics.....	19
Path Model.....	21
Discussion.....	23
Neighborhood Disadvantage and Internalizing Symptoms among Latino Youth.....	23
Health Behaviors, Neighborhood Disadvantage, and Internalizing Symptoms.....	25
The role of Time in the US.....	28
Limitations and Future Directions.....	29
Conclusions and Future Directions.....	31
References.....	33

List of Tables

Table 1: Descriptive Statistics and Correlations of Study Variables.....	47
Table 2: Experiences of Neighborhood Disadvantage.....	48

List of Figures

Figure 1: Path Model of First Order Effects in Relation with Internalizing Symptoms.....	49
Figure 2: Association between Neighborhood Disadvantage and Depressive Symptoms at High and Low Levels of Sleep Problems.....	50

An Examination of the Role of Health Behaviors in the Relation between Neighborhood Disadvantage and Internalizing Symptoms among Latino Adolescents

The Latino population in the United States is growing rapidly, with census data indicating a 43% growth in this population from 2000 to 2010 (Ennis, Ríos-Vargas, & Albert, 2011). Projections estimate that by 2050, Latino youth will make up 35% of the population of those under the age of 17 living in the United States (Passel & Cohn, 2008). Research has documented that a substantial proportion of Latino youth report internalizing symptoms, and these symptoms may occur more frequently compared to youth from other racial and ethnic groups in the United States (McLaughlin, Hilt, & Nolen-Hoeksema, 2007; U.S. Department of Health and Human Services, 2001). Less evidence is available on factors that may contribute to the development of internalizing symptoms among Latino youth. Examining influences on mental health outcomes among minority youth in general is important to understand the applicability of theories built predominately on research with White, non-Hispanic youth in order to better address the needs of minority youth (Hall & Maramba, 2001). Further, most extant research examining internalizing symptoms among Latinos does not address the language barriers that may exist for Latinos to participate in research nor take into account the heterogeneity that may exist among Latinos, such as the length of time they have lived in the United States, socioeconomic status, and characteristics of the communities in which they reside. As a result, within-group differences may be unaccounted for in understanding mental health outcomes of Latinos (Roosa et al., 2008). With the rising rate of Latinos residing in the United States, research is needed to address this gap in order to better serve Latino youth.

Contextual factors that pose a threat to a sense of safety may contribute to the development of internalizing symptoms within a particular population (Grant et al., 2003).

Neighborhood disadvantage is one contextual factor that has been examined in relation to the development of internalizing symptoms. Research suggests that youth across racial and ethnic backgrounds who reside in disadvantaged neighborhoods are at risk for developing internalizing symptoms (Leventhal & Brooks-Gunn, 2000; Paczkowski & Galea, 2010; Roosa et al., 2010; Santiago, Wadsworth, & Stump, 2011). With 26.6% of Latinos residing in the United States living below the poverty line (DeNavas-Walt, Proctor, & Smith, 2013), many live in disadvantaged neighborhoods (Roosa et al., 2010). The impact of residing in disadvantaged neighborhoods on internalizing symptoms of adolescents may be amplified as their desire for greater autonomy and independence leads to spending increasing amounts of time with peers outside of the home (Leventhal, Dupere, & Brooks-Gunn, 2009). This study examines the influence of neighborhood disadvantage on internalizing symptoms within a sample of Latino adolescents. In order to better address the needs of youth in general, and Latino youth in particular, it is also important to examine factors that may influence the relation between neighborhood disadvantage and internalizing symptoms, particularly those factors that can be addressed through intervention. To this end, this study evaluates health behaviors, such as physical activity, sleep, and diet, as moderators of the relation between neighborhood disadvantage and internalizing symptoms among a sample of Latino adolescents.

Neighborhood Disadvantage and Internalizing Symptoms

Disadvantaged neighborhoods, which consist of areas with high rates of poverty and violence, limited resources, and poor housing, present a range of adverse conditions for youth and adults residing in these areas (Attar, Guerra, & Tolan, 1994). Social ecological theory posits that environmental factors, such as neighborhood disadvantage, can significantly influence

mental health (Paczkowski & Galea, 2010). This may be due to the psychological and biological impact of chronic exposure to adverse environmental conditions experienced by youth in these neighborhoods (Compas, 2006). In particular, exposure to these conditions triggers an *allostatic* response that includes both psychological and biological reactions (McEwen, 1998). Repeated allostatic responses, which can be found among those exposed to chronic adverse conditions such as that experienced in a disadvantaged neighborhood, can contribute to problems with allostatic load, defined as “wear and tear on the body” (McEwen, 1998; McEwen & Seeman, 1999). Allostatic load can impair an adolescent’s ability to cope with the stress associated with these conditions (Compas, 2006). Therefore, youth with prolonged allostatic load may be more vulnerable to developing symptoms of anxiety and depression due to their diminished ability to cope with their environmental conditions (Rogosch, Dackis, & Cicchetti, 2011).

Many studies have established the relation between neighborhood disadvantage and externalizing symptoms (Goodnight et al., 2012; Leventhal & Brooks-Gunn, 2000). Less is known about the relation between neighborhood disadvantage and internalizing symptoms, such as anxiety and depression (Deng et al., 2006), but available evidence suggests that neighborhood disadvantage does have a deleterious effect on internalizing symptoms. For instance, Aneshensel and Sucoff (1996) found that adolescents who perceive their neighborhoods to have more hazardous qualities (e.g., crime, graffiti) were more likely to report symptoms of anxiety and depression. Deng and colleagues (2006) similarly found that poor perceived neighborhood quality was associated with high levels of internalizing symptoms in children ages 9-13 (as reported by both mothers and their children). Furthermore, although symptoms of anxiety and depressive disorders are found to be moderately to highly correlated (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000), prior research provides an understanding of the distinctions between

these disorders among youth. For instance, the tripartite model of negative affect, positive affect, and physiological hyperarousal (Clark & Watson, 1991) provides evidence of differences among youth with symptoms of depression, symptoms of anxiety, and symptoms of both disorders (Laurent & Ettelson, 2001). This model suggests that both anxiety and depression are associated with negative affect, while anxiety is distinguished by the presence of physiological arousal and depression is characterized by low positive affect (Clark & Watson, 1991; Laurent & Ettelson, 2001). Examining risk and protective factors with both anxiety and depression within the same model can assist in furthering our understanding of the differences in these disorders (Gaylord-Harden, Elmore, Campbell, & Wethington, 2011; Gunthert, Cohen, & Armeli, 2002) and improve identification of those at risk for developing these symptoms (Gaylord-Harden et al., 2011). This is particularly important among minority youth, since much of the research examining anxiety and depression has been conducted with White, non-Hispanic samples (Safren et al., 2000).

Little is known about the impact of neighborhood disadvantage on Latino youth in particular (Gonzales et al., 2011; Plunkett, Abarca-Mortensen, Behnke, & Sands, 2007; Roosa et al., 2010), despite the high rate of Latino youth and families residing in inner city communities across the country (Ramirez & de la Cruz, 2003). In general, examining the impact of neighborhood disadvantage across and within racial and ethnic groups is important for understanding cultural variations on the outcomes associated with living in these environments (Roosa et al., 2010). For example, the impact of neighborhood disadvantage on internalizing symptoms may differ among racial and ethnic groups. Many Latino youth living in the United States are immigrants or children of immigrants. Youth who immigrated to the United States may perceive threat and danger within their neighborhood differently than those who were born

in the United States. Those youth who immigrated to the United States may see their current neighborhood in the United States as less dangerous and more prosperous compared to the neighborhood that they lived in before immigrating (Roosa et al., 2010). Latino families also tend to live in low-income neighborhoods primarily consisting of other Latino families (Vigil, 2002). As a result, the neighborhoods in which many Latino families reside adopt social and cultural values common to Latino culture. This may include a collectivist approach within the neighborhood. Collectivism emphasizes the importance of meeting the needs of a group over an individual (Triandis, Bontempo, Villareal, Asai, & Lucca, 1988), and includes behaviors in a neighborhood context such as adult monitoring of children within the neighborhood and support during stressful life events (e.g., economic stress; Roosa et al., 2010). Neighborhoods with high levels of collectivist attitudes have less neighborhood violence than those with low levels of collectivist attitudes (Sampson, Raudenbush, & Earls, 1997). However, research has also demonstrated a relation between associating with a collectivist culture and internalizing symptoms (Varela & Hensley-Maloney, 2009). Several explanations may account for this relation (Varela & Hensley-Maloney, 2009). For instance, a person's emotional expression may reflect cultural models of self-expression (Mesquita & Walker, 2003). Within Latino culture, self-control, compliance, and emotional restraint may be valued as appropriate behaviors; however, this may result in internalized emotional expression (Varela & Hensley-Maloney, 2009). Research is warranted to understand the relation between neighborhood disadvantage and internalizing symptoms in Latino youth given the potential differences this group may experience in the neighborhood environment.

One of the few studies that looked at the relation between neighborhood disadvantage and internalizing symptoms in Latino youth examined a sample of 5th grade students and found

that neighborhood disadvantage was associated with internalizing symptoms through a moderating model of peer deviance, such that those who resided in disadvantaged neighborhoods and associated with deviant peers were more likely to report symptoms of internalizing disorders than those who did not associate with deviant peers (Roosa et al., 2010). Even less is known about the relation between neighborhood disadvantage and internalizing symptoms in Latino adolescents despite the fact that symptoms of internalizing disorders increase during adolescence across ethnic and racial groups (Canino et al., 2004; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Therefore, this study examines the impact of neighborhood disadvantage on symptoms of anxiety and depression among a sample of Latino adolescents living in neighborhoods across a large metropolitan area.

Buffering Effects of Health Behaviors

Researchers who examine neighborhood effects on youth assert that the neighborhood context likely interacts with other factors to influence adolescent outcomes, although limited research has actually tested this assertion (Leventhal et al., 2009). Therefore, in addition to better understanding the relation between neighborhood disadvantage and internalizing symptoms in Latino adolescents, research should examine factors that may buffer this relation in order to inform prevention and intervention efforts. According to the buffering hypothesis, buffering resources may protect a person from the negative influence of stressors by providing mechanisms such as self esteem, problem solving, companionship, and instrumental assistance to address the needs of a person (Cohen & Wills, 1985). Buffering resources may reduce one's initial response to stressful events and limit the level of stress experienced following an event (Cohen & Wills, 1985). Previous research has found that health behaviors buffer the relation

between stressful life events and physical health (Brown & Siegel, 1988). Recently, the literature on buffers has begun to examine the role of health behaviors in the relation between stressful life events and mental health symptoms, including internalizing symptoms (Sund, Larsson, & Wichstrom, 2011). For instance, Sund and colleagues (2011) found that youth who are exposed to stressful life events but who engage in more physical activity may be less likely to report internalizing symptoms (Sund et al., 2011). Health behaviors, such as physical activity, sleep, and diet, are important factors to examine as buffers to neighborhood disadvantage for several reasons. Health behaviors influence allostatic load both as coping mechanisms and through influences on the biological pathways of allostatic responses (Hill, Burdette, & Hale, 2009; McEwen, 1998). It may be that engagement in health behaviors serves to improve one's ability to cope with the chronic adverse conditions associated with residing in a disadvantaged neighborhood through decreasing the allostatic response. Health behaviors can also be targeted through interventions and can have public health implications (e.g., Oddy et al., 2009; U.S. Department of Health and Human Services, 2008). Furthermore, examining these health behaviors together can provide information on adolescent life-styles and provide opportunities to inform an integrated intervention approach (Neumark-Sztainer et al., 1997). The next sections review three health behaviors, physical activity, sleep, and diet, as potential buffers in the relation between neighborhood disadvantage and internalizing symptoms.

Physical Activity. Results from a national survey suggest that 13.8% of adolescents have not engaged in 60 minutes of physical activity on any day in the seven days prior to the survey (Eaton, Kann, Kinchen, Shanklin, Flint, Hawkins, et al., 2012), despite recommendations that youth engage in at least 60 minutes of physical activity each day (U.S. Department of Health and Human Services, 2008). Research has shown that participation in physical activity is related to

lower levels of internalizing symptoms among youth (Motl, Birnbaum, Kubik, & Dishman, 2004; Sallis, Prochaska, & Taylor, 2000; Sund et al., 2011). This may be due to biological influences of physical activity, such as increased blood flow, and psychological influences, such as building self esteem, providing a distraction from negative events, as well as establishing an emotional balance (Gore et al., 2001; Rooks, 2010; Camacho, 1991; Sigfusdottir et al., 2011; Taylor, 1985). Sallis and colleagues (2000) conducted a review of the literature and found that high levels of depressive symptoms were correlated with low levels of physical activity. In a longitudinal study of a school-based sample of adolescents, those adolescents who reported a decrease in their level of physical activity reported an increase in depressive symptoms over the course of two years (Motl et al., 2004). These findings suggest that physical activity may be an important prevention and intervention tool for addressing internalizing symptoms in youth.

Despite its importance to mental health outcomes, however, youth residing in disadvantaged neighborhoods may engage in less physical activity than those residing in other neighborhoods (Davison & Lawson, 2006; Franzini et al., 2009; Molnar, Gortmaker, Bull, & Buka, 2004; Singh, Kogan, Siahpush, & van Dyck, 2008). For example, among a sample of youth living in neighborhoods across Chicago, Molnar and colleagues (2004) found that those residing in more disadvantaged neighborhoods reported significantly less engagement in physical activity. Research suggests that neighborhoods are potentially beneficial spaces for physical activity to occur since neighborhoods are free and easily accessible and provide a medium for unstructured activities (as opposed to competitive games; Carver, Timperio, & Crawford, 2008), and time spent outside is an indicator of physical activity involvement (Sallis et al., 2000). Youth who reside in neighborhoods that may not be safe, however, may not utilize their neighborhood as a place to engage in physical activity (Gomez, Johnson, Selva, & Sallis, 2004). Research is

warranted to understand the role physical activity plays in the relation between neighborhood disadvantage and mental health outcomes such as internalizing symptoms to inform the development of prevention and intervention techniques for youth residing in disadvantaged neighborhoods. This may be particularly important to examine in Latino adolescents, as adolescents may be less likely to engage in physical activity than younger children (Singh et al., 2008) and Latino adolescents are less likely to engage in physical activity than white, non-Hispanic adolescents (Eaton et al., 2010).

Sleep. Sleep is an important health behavior that has implications for physical, cognitive, and emotional development in youth (e.g., Fallone, Owens, & Deane, 2002). Sleep is also prone to many disturbances among youth and adults. Sleep disturbance can take several forms, such as difficulty falling or staying asleep, sleep interruptions related to chronic illness, and sleep disorders (Smaldone, Honig, & Byrne, 2007). Further, adolescence is a time marked by poor sleep habits (e.g., Owens & Witmans, 2004). Despite the fact that sleep needs remain consistent between school-age children and adolescents (Owens & Witmans, 2004), sleep tends to decrease during the adolescent period due to pubertal changes, different expectations (e.g., increased amounts of homework, after-school jobs, earlier school start times), and different schedules between the week and weekend (Carskadon, Vieira, & Acebo, 1993; Owens & Witmans, 2004; Szymczak, Jasinska, Pawlak, & Zwierzykowska, 1993). Indeed, national data suggest that only 31.8% of adolescents get eight or more hours of sleep per night even though medical guidelines recommend 8-9 hours of sleep per night for optimal health and development (Eaton et al., 2012). Research has also found that ethnic minority youth have more sleep problems than white, non-Hispanic youth. For example, Roberts, Roberts, and Chen (2000) found that Mexican-American youth were at higher risk for insomnia than white non-Hispanic youth.

Sleep disturbances can negatively influence youth mental health. Sleep acts as a restorative function on physiological and psychological processes, including stress systems activated through exposure to stressors; disturbances in sleep can limit the body's ability to restore itself through the sleep process, thus making individuals more vulnerable to the negative consequences of these stressors (Hamilton, Nelson, Stevens, & Kitzman, 2007; Meerlo, Sgoifo, & Suchecki, 2008). In disadvantaged neighborhoods, sleep disturbances may interfere with the ability to cope with the adverse environmental conditions associated with these neighborhoods, leading to increased susceptibility for developing mental health symptoms (Hill, Burdette, & Hale, 2009). Sleep relates to internalizing symptoms among youth, with research indicating that youth who do not get adequate sleep are more likely to report internalizing symptoms than youth who get adequate sleep (Smaldone et al., 2007). In a sample of Mexican-American youth, findings indicated that variability in one's sleep schedule was significantly related to depressive symptoms (McHale, Kim, Kan, & Updegraff, 2011). Studies have also shown that youth residing in disadvantaged neighborhoods may have worse sleep habits than those residing in other neighborhoods (Moore et al., 2011). Neighborhood disadvantage has also been linked to a diagnosis of sleep apnea in children (Brouillette, Horwood, Constantin, Brown, & Ross, 2011; Spilsbury et al., 2006). This was the case even when controlling for other individual and family risk factors (e.g., caregiver education level, obesity, and race), suggesting that aspects of the neighborhood are uniquely contributing to the risk for sleep problems (Spilsbury et al., 2006). Given the role of sleep in youth mental health and the high risk of sleep disturbances found among youth residing in disadvantaged neighborhoods, examining the role of sleep in the relation between neighborhood disadvantage and internalizing symptoms among a sample of Latino adolescents may provide information on targets for intervention.

Diet. Diet is another health behavior that has been implicated in numerous health benefits. Approximately 62.3% of adolescents nationally report consuming one or more vegetables per day and 64% report consuming one or more fruit per day within a seven-day period (Eaton et al., 2012). Research on dietary habits has shown that youth who eat healthier report lower levels of internalizing symptoms (Brooks, Harris, Thrall, & Woods, 2002; Jacka et al., 2010; Oddy et al., 2009). In a sample of Australian adolescents, those reporting a more balanced, healthy diet were less likely to report symptoms of depression (Jacka et al., 2010). This may have some relation to obesity levels, which have been found to relate to symptoms of depression (for a review, see Bamber, Stokes, & Stephen, 2007). Several mechanisms may account for the role of diet in improving internalizing symptoms, including an increase in essential nutrients, influences on neurotransmitters that play a role in symptoms of anxiety and depression, and influences on functions such as the thyroid, which has been implicated as playing a role in mental health symptoms such as depression (Bamber et al., 2007).

Despite the positive effects of healthy diet on mental health, however, research has found that there is a global shift in dietary habits, with poorer habits (e.g., increase in sugar and fat intake) becoming more common across the world, including the United States (Popkin & Gordon-Larsen, 2004). The neighborhoods in which youth reside are found to influence diet, with those youth residing in more disadvantaged neighborhoods having a worse diet, such as consuming fewer fruits and vegetables and more foods high in fat and sugar (Ellen, Mijanovich, & Dillman, 2001; Lee & Cubbin, 2002). This may relate to availability of local groceries that carry healthy food options such as fruits and vegetables (Lee & Cubbin, 2002). Thus, diet appears to be a particularly important area to investigate to determine ways to mitigate the impact of neighborhood on internalizing symptoms.

Present Study

Research indicates that, although neighborhood disadvantage puts youth at risk for developing internalizing disorders, health behaviors may buffer this relation. Despite the growing population of Latino youth in the United States, limited research has been conducted on the relation of neighborhood disadvantage and internalizing symptoms in primarily Latino samples, including the role of health behaviors in this relation. Research with Latino youth, particularly those without legal immigration documentation, may be more challenging than with youth from other racial or ethnic groups due to potential language barriers and concerns with protecting undocumented immigrants' confidentiality (APA Task Force on Immigration, 2012). With the growing population of Latino youth in the United States, the risk of internalizing symptoms among this population, and the paucity of research examining contextual factors associated with mental health outcomes among this population, research is warranted that examines factors influencing mental health outcomes within this population. The current study sought to address these barriers by sampling Latino adolescents attending a school system that primarily serves Latino youth. Thus, this study examined the relation between neighborhood disadvantage and internalizing symptoms, as well as the moderating role of health behaviors, among a sample of low-income Latino adolescents attending a charter high school.

This study had two aims: 1) to examine the relation between neighborhood disadvantage and anxiety and depressive symptoms among a sample of predominantly low-income Latino adolescents; and 2) to examine whether health behaviors, including physical activity, sleep, and diet, buffer the relation between neighborhood disadvantage and internalizing symptoms among this same sample. It was expected that high levels of neighborhood disadvantage and low levels

of health behaviors would be related to high levels of anxiety and depressive symptoms. It was also expected that participation in physical activity, quality sleep, and consumption of fruits and vegetables would buffer the impact of neighborhood disadvantage on anxiety and depressive symptoms, such that youth residing in more disadvantaged neighborhoods but who engage in high levels of health behaviors would report fewer symptoms of internalizing symptoms than those residing in more disadvantaged neighborhoods but who engage in low levels of health behaviors. Youth who reside in less disadvantaged neighborhoods but who engaged in high levels of health behaviors were also expected to have lower levels of internalizing symptoms than youth in these neighborhoods who engaged in low levels of health behaviors. Since older adolescents are more likely to report internalizing symptoms than younger adolescents, and since females are more likely to report these symptoms than males, age and gender were controlled for in the analysis (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Analyses also controlled for proportion of time spent living in the United States to account for heterogeneity within the sample that may exist due to varying time participants have spent in the United States (Roosa et al., 2008).

Methods

Participants

Participants for this study included 144 adolescents recruited from a charter high school located in a large, Midwestern city. Charter schools receive some funding from state and local governments, however, they are managed by a private board through their charter organization rather than through the public school board. The board that managed this particular charter school is affiliated with a community center for Latino families in this city. The school was

originally developed as an alternative school. Given the high rate of school dropout found among Latino youth (Aud, Fox, M., & KewalRamani, 2010), this school now focuses on academic success and college readiness for a predominantly Latino student body. Charter schools draw students from neighborhoods across the city, which in this study was expected to increase variability in the neighborhood disadvantage measure compared to a public school, which draws from a smaller number of neighborhoods. School data indicate that students at this school reside across fifteen different zip codes in the city in which it is located. Despite drawing from diverse neighborhoods, the students primarily live in low-income households, and 95.4% of students at this school qualified for free or reduced lunch fees. To recruit participants, we set up a table in the school's main hallway during parent-teacher conferences, which allowed us to give information about the study to parents and caregivers who attended conferences. Those interested in enrolling their adolescents signed a statement of informed consent giving permission for their adolescent to participate. Since the majority of parents at this school speak Spanish as their primary language, consent forms were provided in both English and Spanish, and school-sanctioned translators assisted the researchers in providing families with information and answering families' questions about the study. For those parents who did not attend parent-teacher conferences, consent forms were sent home with their children who could then return the signed forms to the school, and then the school provided the forms to the research team. Students who were 18 years old or older were allowed to consent for their own participation.

Out of the 207 students enrolled in the school, 155 (77%) received consent to participate in the study; 142 received parental consent and 13 were old enough to provide consent for themselves. Approximately two-thirds of the returned consent forms were the Spanish version. Of the 155 students with permission to participate, 152 (98%) completed the survey. Assent was

obtained from participants before completing the survey. For the purposes of the current study the 144 participants who self-identified as Latino/Hispanic when completing the survey's demographics form were included in the analysis. This includes 78 males and 66 females with an age range of 14-19 ($M = 16.25$, $SD = 1.46$). This study was approved by the researchers' institutional review board and the charter school administrators prior to data collection.

Procedures

Participants completed survey measures during their writing class, which all students in the school are required to take. The classes range in size from 9-24 students. One member of the research team was in each writing class and read each question aloud while participants completed their own survey. Most students finished the survey in 30 minutes. To increase participants' comfort in answering the questions, no school personnel were present in the room while surveys were administered. School personnel provided names of students who might prefer to take the survey in Spanish. These students were given the option of completing the survey in Spanish; 3 completed the Spanish version. Participants were given a \$5.00 debit card for their time. All documents were translated by a school-sanctioned translator.

Measures

Demographics. Participants completed a series of demographic questions, including age, gender, ethnicity, and time spent living in the United States. Diverse methods across studies are used to measure time in the US. For instance, some studies measure time in the US as a dichotomous variable, such as categorizing participants based on age at entry into the US, nativity, or generation, or as a continuous variable, such as length of residence in the US (Thomson & Hoffman-Goetz, 2009; Vega, Sribney, Aguilar-Gaxiola, & Kolody, 2004; Warheit,

Vega, Khoury, Gil, & Elfenbein, 1996). In the current study, a continuous variable was calculated that took into account the variability in participant ages within this sample by calculating time in the US as a proportion, dividing the number of years spent living in the United States by age.

Depression. Depressive symptoms were measured using the Withdrawn/Depressed subscale of the Youth Self Report (Achenbach & Rescorla, 2001) which consists of eight items (e.g., “There is very little that I enjoy.”). The Youth Self Report uses a three-point likert scale (0 = Not at all true, 1 = somewhat or sometimes true, 2 = very or often true). Research has found this measure to be reliable and valid (Achenbach & Rescorla 2001). A sum of the scores on the items was calculated for analyses, with higher scores indicating more depressive symptoms. Internal consistency for this subscale in the current sample was good ($\alpha = .79$). Findings from the nonreferred normative sample of 11-18 year olds (8% Latino) suggest that a summed score of 7 or higher for males and 8 or higher for females is considered to be in the at-risk or clinically significant range (Achenbach & Rescorla, 2001).

Anxiety. Symptoms of anxiety were assessed using the short form of the Revised Children’s Manifest Anxiety Scale – Second Edition (RCMAS-2; Reynolds & Richmond, 2008). This measure includes ten items assessing the presence or absence (i.e., yes = 1/no = 0) of anxiety symptoms (e.g., “I often worry about something happening to me.”). A sum of the scores in the ten items was calculated for analyses, with higher scores indicating more symptoms of anxiety. Because the response options for this measure are dichotomous, there is a restricted range of possible scores on this measure; therefore, internal consistency was not calculated (Cohen, Cohen, West, & Aiken, 2003). Findings from the normative sample of adolescents

suggest that a summed score of 6 or higher for those ages 15-19 and a score of 7 or higher for those ages 9-14 is in the At-Risk or Clinically Significant range (Reynolds & Richmond, 2008). Although no known studies have examined the cultural validity of the RCMAS-2 among Latino youth, studies examining a previous version of this measure (RCMAS) found this to be a valid measure of anxiety among Latino youth (Varela & Biggs, 2006; Varela, Sanchez-Sosa, Biggs, & Luis, 2008).

Neighborhood Disadvantage. Neighborhood disadvantage was measured using a nine-item measure that combined items from two established measures of neighborhood qualities in order to measure a diverse range of adverse neighborhood experiences. Four items were drawn from the Institutional Control Scale (Elliott et al., 1996) and five items came from the Neighborhood Disorder Scale (Fauth, Leventhal, & Brooks-Gunn, 2004). Items used for this study were phrased in terms of whether each neighborhood quality was perceived as a problem by the respondent (e.g., “People using drugs in public places is a problem in my neighborhood”). Participants responded on a 5-point Likert scale ranging from 1 = “Strongly Disagree” to 5 = “Strongly Agree.” For this analysis, a sum of the scores was computed. The internal consistency in the current sample was good ($\alpha = .87$). Higher scores indicate that participants perceive more problems in their neighborhood, which represents neighborhood disadvantage. Findings from a study of 315 low-income Black and Latino adults in Yonkers, New York using 5 of the 9 items from this measure (i.e., people drinking in public places, graffiti, run-down buildings, people using drugs, and people saying insulting things or bothering people as they walk by) found a mean of 0.72 (SD = 0.74), which is between “no problem” and “some problem” based on a 0-2 rating scale (Fauth et al., 2004). Previous research with the same 9-items used in the current study using a community sample of 147 socioeconomically at-risk youth ages 5-13 year old

residing in a mid-sized city reported a mean of 3.37 (SD = 1.20) when using a likert scale where 1 = “strongly agree” and 5 = “strongly disagree” (Fite, Vitulano, & Preddy, 2011). In the current sample, when recoding the variables to match the Fite et al. (2011) coding, the mean across the 9 items was 3.12 (SD = 1.06), falling between “disagree” and “neither agree nor disagree,” as in the Fite et al. (2011) study.

Physical Activity. Physical activity was measured with a single item drawn from a primary care screening measure (Prochaska, Sallis, & Long, 2001). The item asks on how many days an adolescent is physically active for at least 60 minutes during a typical week and responses can range from 0-7. Previous research tested the validity between this measure and physical activity measured by an accelerometer and found a significant correlation ($r = .40, p < .001$) among a diverse sample of adolescents (Prochaska, Sallis, & Long, 2001).

Sleep Problems. Sleep problems were measured using a Sleep/Wake Problem Behavior scale from the Sleep Habits Survey (Wolfson & Carskadon, 1998). The scale includes fourteen items assessing sleep problems in the past two weeks (e.g., “In the last two weeks, how often have you awakened too early in the morning and couldn’t get back to sleep?”). Previous research on over 3,000 youth in Rhode Island using a 10-item version of this measure found the measure to have adequate internal consistency ($\alpha = .75$; Wolfson & Carskadon, 1998). Items were measured on a five-point likert scale (1 = “Never” – 5 = “Every day/night”) and were summed for a total score, with higher scores indicating more sleep problems. Two items (“felt satisfied with your sleep” and “had a good night’s sleep”) were reverse coded to be consistent with scoring. Internal consistency in the current sample was adequate ($\alpha = .73$).

Diet. Diet was measured with a two item screening measure that asked about how many

servings of fruits and vegetables that participants ate on a typical day (Prochaska & Sallis, 2004). The measure provides examples of a serving size using a variety of preparation methods (e.g., one medium piece of fresh fruit, ½ cup of fruit salad, ¼ cup of dried fruit, or six ounces of 100% juice each counted as one fruit serving). Restrictions were also provided on the measure for items that should not be included in the servings count (e.g., French fries should not be included as a vegetable). In previous research (Prochaska & Sallis, 2004), tests of validity showed a significant correlation between this measure and a food diary ($r = .23, p = .008$). A sum of the number of servings endorsed was computed, with higher numbers indicating more servings of fruits and vegetables consumed during a typical day.

Results

Descriptive Statistics

Descriptive statistics were calculated to describe the current sample's exposure to neighborhood disadvantage, engagement in physical activity, sleep problems, intake of fruits and vegetables, symptoms of anxiety, symptoms of depression, proportion of time participants lived in the United States, age, and gender (Table 1). Most participants reported exposure to neighborhood disadvantage, with only 3 participants (2%) reporting no neighborhood disadvantage. Table 2 lists the individual aspects of neighborhood disadvantage endorsed by participants in this study. When examining mental health outcomes, 73% of participants reported experiencing at least one anxiety symptom and 12% reported a sum of 6 or more anxiety symptoms. A total of 92% of participants endorsed "somewhat or sometimes true" for at least one depressive symptom and 18% reported a sum of 7 or higher for depressive symptoms. Participants also reported spending an average of 76% of their life in the United States, with 44%

reporting having spent their entire life in the US and 19.9% reporting that they spent less than half of their life in the United States. With regards to health behaviors, 91% of participants endorsed that they were physically active for at least 60 minutes per day at least one day during a typical week and 11% endorsed this level of activity 7 days per week during a typical week. The majority of participants also reported that they experience sleep problems, with only one participant (0.7%) reporting no experience of any sleep problems in the last two weeks. Finally, 90% of participants reported consuming at least one serving of fruit or vegetable in a typical day.

Correlation analyses were calculated to examine the bivariate associations between study variables (Table 1). To understand the size of the effect, r-values of .10 are considered small, r-values of .30 are considered medium, and r-values of .50 or greater are considered large effects (Cohen, 1988). Findings indicated that neighborhood disadvantage was moderately positively associated with anxiety symptoms but was not related to depressive symptoms. Neighborhood disadvantage was also positively associated with the proportion of their life spent in the US and sleep problems, although these relations were small. Physical activity was moderately related to gender, with boys reporting that they engaged in physical activity on more days than girls. Physical activity was positively related to diet, with those engaging in more days of physical activity also reporting that they consumed more fruits and vegetables on a typical day. Physical activity was also negatively related to depressive symptoms; those who reported engaging in more days of physical activity reported fewer depressive symptoms. No relation was evident between physical activity and anxiety symptoms. Sleep problems were moderately positively related to both anxiety and depressive symptoms. No other significant correlations were found for gender, time in the US, or diet, and none of the variables were significantly associated with age.

Path Model

Path models within a structural equation modeling framework were estimated through an iterative approach to evaluate study hypotheses using Mplus statistical software. A path model evaluates relations between observed variables, as opposed to CFA and hybrid models, which model latent variables (Kline, 2011). Use of path analyses allowed both outcomes (i.e., symptoms of depression and symptoms of anxiety) in the model to be evaluated simultaneously. All variables were standardized, with a mean of 0 and a standard deviation of 1, prior to creating interaction terms to aid in the interpretation of the hypothesized interactions.

Skewness and kurtosis were calculated to assess for normality of the variable distributions and results indicated that non-normality was not a concern (skewness < 3, kurtosis < 13). Therefore, Full Information Maximum Likelihood Estimation (FIMLE) was used (Kline, 2011). Five participants were missing data on the independent variables, and therefore were unable to be used in this analysis (Muthen & Muthen, 2006). Therefore, the path model was estimated with a sample size of 139 participants. The sample size of this study was sufficient for detecting medium to large effect sizes (Aiken & West, 1991).

This model was fully saturated, meaning it had 0 degrees of freedom, because the model had the same number of parameters as the data (Little, 2013). When a model is fully saturated, it is considered to have perfect fit (Little, 2013). As a result, model fit indices are not reported.

To evaluate the first aim of the study examining the relation between neighborhood disadvantage and anxiety and depressive symptoms, an initial model, whereby symptoms of anxiety and depression were regressed onto neighborhood disadvantage, physical activity, sleep and diet, was first estimated (Figure 1). Age, gender, and time spent living in the United States

were included as covariates given their potential influence on the presence of internalizing symptoms (Costello et al., 2003; Roosa et al., 2008). Findings indicated that physical activity ($B = -.21, p = .02$) and sleep ($B = .20, p = .02$) were significantly associated with depressive symptoms, suggesting that those who reported engaging in fewer days of physical activity and those who reported elevated levels of sleep problems also reported elevated levels of depressive symptoms. Neighborhood disadvantage was not associated with depressive symptoms ($B = .06, p = .48$). Findings also indicated that neighborhood disadvantage ($B = .27, p = .001$) and sleep ($B = .29, p < .001$) were significantly positively associated with anxiety symptoms, meaning that those who reported elevated levels of neighborhood disadvantage and those who reported elevated levels of sleep problems also reported elevated levels of anxiety symptoms.

To evaluate the second aim of the study examining the buffering effect of health behaviors in the relation between neighborhood disadvantage and anxiety and depressive symptoms, three, two-way interactions (i.e., neighborhood disadvantage x physical activity, neighborhood disadvantage x sleep, and neighborhood disadvantage x diet) were added to the initial model to determine if the association between neighborhood disadvantage and symptoms of anxiety and depression depended on the health behaviors. No significant interactions were found in relation to anxiety symptoms ($Bs = -.08 - .11, ps > .12$). Findings revealed a trend towards statistical significance in the interaction between neighborhood disadvantage and sleep in association with depressive symptoms ($B = .13, p = .08$). This interaction was probed at high and low levels (+1 SD and -1 SD from the standardized values) of sleep problems to determine the nature of the effects (Aiken & West, 1991). Results indicated that for those who reported high levels of sleep problems, a trend towards significance was found between neighborhood disadvantage and depressive symptoms ($B = .20, p = .09$; Figure 2), suggesting that youth who

reported elevated levels of both neighborhood disadvantage and sleep problems reported the highest levels of depressive symptoms. In contrast, neighborhood disadvantage was not significantly related to depressive symptoms at low levels of sleep problems ($B = -.07, p = .55$; Figure 2), suggesting that neighborhood disadvantage appears to only be associated with depressive symptoms when sleep problems are evident.

Discussion

This study examined the relation between neighborhood disadvantage and symptoms of anxiety and depression among a sample of Latino adolescents, as well as the role of health behaviors, including physical activity, sleep, and diet, in this relation. This is the first known study to simultaneously examine multiple health behaviors as potential buffers in the relation between neighborhood disadvantage and internalizing symptoms. In this study, differences were found among factors associated with anxiety and depressive symptoms in this sample, which is consistent with the understanding that these are related but distinct disorders (Clark & Watson, 1991). With the high rate of internalizing symptoms reported among Latino youth in the US, and given the increasing number of Latino youth residing in the US, understanding factors that influence anxiety and depressive symptoms is essential in order to inform culturally sensitive prevention and intervention efforts.

Neighborhood Disadvantage and Internalizing Symptoms among Latino Youth

Among this sample of low-income Latino youth, neighborhood disadvantage was associated with symptoms of anxiety but not depression. This relation held even when accounting for the other independent variables in the path analysis. Previous research has found differences in the effects of neighborhood problems, including community violence exposure and

poverty, on anxiety and depressive symptoms (Aneshensel & Sucoff, 1996; Mazza & Reynolds, 1999). For instance, Mazza and Reynolds (1999) found that community violence exposure was significantly related to posttraumatic stress disorder when taking into account depression and suicidal ideation, but it was not associated with depression when taking into account posttraumatic stress disorder and suicidal ideation. Aneshensel and Sucoff (1996) found that, although Latino youth reported more depressive symptoms than youth from other racial or ethnic backgrounds, those Latino youth who lived in impoverished neighborhoods with a large number of Latino residents reported lower rates of depressive symptoms than other youth. In addition, as described in the tripartite model (Clark & Watson, 1991), physiological arousal can distinguish anxiety from depression. It may be that neighborhood disadvantage was related to symptoms of anxiety and not depression in the current study due to the physiological arousal that may result from residing in such neighborhoods. Symptom expression may also explain the differences found between symptoms of anxiety and depression in relation to neighborhood disadvantage. As noted by Reynolds and colleagues (2001), heightened somatic symptoms among urban youth, such as headaches or stomachaches, may be an adaptive expression of distress related to neighborhood disadvantage as opposed to other symptoms consistent with depression that may suggest weakness, such as crying. Somatic complaints, which were captured through the measure of anxiety in the current study, may provide an acceptable excuse for avoiding otherwise dangerous situations or may be a more acceptable form of emotional expression than other psychological symptoms (Reynolds et al., 2001). As discussed below, it might be that neighborhood disadvantage is only related to depressive symptoms when other risks are evident, such as sleep problems. Examining factors that may account for the relation between neighborhood disadvantage and symptoms of anxiety and depression, particularly factors salient

to Latino youth, is important for understanding the relation between neighborhood disadvantage and internalizing symptoms among Latino youth.

Health Behaviors, Neighborhood Disadvantage, and Internalizing Symptoms

Health behaviors appear to be related to anxiety and depressive symptoms differently within this sample. Consistent with previous research (Sallis et al., 2000), physical activity was related to depressive symptoms, with youth who engaged in more days of physical activity reporting lower levels of depressive symptoms. However, physical activity was not associated with anxiety symptoms. Physical activity can provide both physiological and psychological benefits, such as increased self-esteem, increased blood flow, and distraction from negative events (Gore et al., 2001; Rooks, 2010; Camacho, 1991; Sigfusdottir et al., 2011; Taylor, 1985). The tripartite model suggests that depression is associated with low positive affect (i.e., anhedonia) while anxiety is not associated with levels of positive affect. It may be that engagement in physical activity results in higher positive affect through the benefits noted above. This may explain the findings in the current study showing lower depressive symptoms, but not anxiety symptoms, for those engaging in physical activity. Future research should examine factors that may account for differences in the relation between physical activity and symptoms of anxiety and depression among Latino youth. Two recent meta-analyses found that engaging in physical activity interventions is associated with lower levels of depression and anxiety among youth (Ahn & Fedewa, 2011; Larun, Nordheim, Ekeland, Hagens, & Heian, 2006). Race and ethnicity, however, was not considered in either of these analyses due to the low number of studies reporting on participant race or ethnicity (Ahn & Fedewa, 2011). Examining physical activity interventions among Latino adolescents appears to be an important next step to assist in

developing prevention and intervention efforts for internalizing symptoms, particularly depressive symptoms, among Latino youth.

In the current study, physical activity did not significantly moderate the relation between neighborhood disadvantage and either anxiety or depressive symptoms. Within the few studies examining the role of physical activity in the relation between exposure to adverse events and conditions and mental health outcomes, findings have been mixed. Some studies have found a buffering effect of physical activity (Rubens & Fite, 2013; Sund et al., 2011) while others did not find a significant interaction (Moksnes, Molijord, Espnes, & Byrne, 2010). Several reasons may account for these differences. For instance, the two studies that did find a buffering effect for physical activity sampled school-aged children and early adolescents, whereas both the current study and the study conducted by Moksnes and colleagues (2010) sampled older adolescents. It may be that as youth get older, other factors may have a stronger influence on the relation between exposure to adverse events and conditions and mental health than physical activity (Moksnes et al., 2010), such as social support and peer environments (Grant et al., 2006). Research is warranted to examine factors related to adolescent involvement in physical activity that may help further understand this relation. Indeed, in a review of the literature, Sallis and colleagues (2000) found that studies examining correlates of physical activity were inconsistent in their findings, and suggest that more research is needed in this area in order to effectively inform intervention efforts. Another reason that may account for why differences are found across studies examining the buffering effect of physical activity is how these studies measured physical activity. For instance, Sund et al. (2011) measured the number of hours of vigorous physical activity participants engaged in per week while Moksnes et al. (2010) looked at the average amount of time youth engaged in leisure physical activity over a month. Future research

should consider using more objective measures of physical activity (e.g., accelerometers; Trost, 2001) and measures examining different types and intensity levels of physical activity to improve our understanding of these relations. In addition, understanding cultural variation in measurement tools for physical activity, such as the types of physical activity and the interpretation of measurement wording, is important to consider when examining physical activity among minority populations (Kriska, 2000).

As expected, sleep problems were positively associated with symptoms of anxiety and depression in the current study. No significant moderation effect was found between sleep problems and neighborhood problems in association with anxiety symptoms, indicating that neighborhood disadvantage is a significant concern for adolescent anxiety regardless of sleep problems. A trend towards significance was found which indicated that sleep problems moderated neighborhood disadvantage in association with depressive symptoms, suggesting that youth with high levels of both neighborhood disadvantage and sleep problems had the highest levels of depressive symptoms. This finding suggests that sleep may buffer the relation between neighborhood disadvantage and symptoms of depression. Previous research has found that sleep quality buffered the relation between neighborhood disorder and psychological distress but did not examine specific mental health disorders (Hill et al., 2009). It may be that differences in depression and anxiety, such as physiological hyperarousal (Clark & Watson, 1991) may account for the differing findings in the current study. As noted earlier, it may also be that other factors, such as peers, play a stronger role in coping with neighborhood disadvantage among adolescents. Thus, future research should examine other factors that may buffer the relation between neighborhood disadvantage and anxiety symptoms, such as peer influences (e.g., Grant et al., 2006). Overall, interventions aimed at sleep among Latino adolescents are an important area for

further investigation, particularly for those experiencing depressive symptoms and who reside in disadvantaged neighborhoods.

Contrary to study hypotheses, diet was not related to either anxiety or depressive symptoms nor did it interact with neighborhood disadvantage in association with anxiety or depressive symptoms. This study only examined fruit and vegetable intake when measuring diet, without considering other foods and nutrients that have been implicated in mitigating or exacerbating internalizing symptoms. For instance, evidence suggests that increasing intake of omega-3 fatty acids may help to reduce depressive symptoms (Nemets, Nemets, Apter, Bracha, & Belmaker, 2006). Oddy and colleagues (2009) found that adolescents who consumed more fast foods, red meat, and sweets also reported more internalizing symptoms. Thus, future research with Latino youth may wish to examine a wide range of foods and nutrients to better understand the role of diet in the proposed relation.

The role of Time in the US

Although not a primary focus of the current study, two findings should be noted that are particularly relevant for research among Latino youth. First, youth in this sample who resided in the US for a greater proportion of their life reported experiencing more neighborhood disadvantage. Roosa and colleagues (2010) posit that youth born in the US or residing in the US for a significant amount of time may perceive their neighborhood differently than more recent immigrants. More specifically, families immigrating to the US may perceive their surroundings to be less dangerous or dilapidated compared to their previous neighborhood. These findings suggest that within-group differences may exist for Latino youth residing in disadvantaged neighborhoods based on how long they have resided in the United States, which may be helpful

in identifying Latino youth most at risk for experiencing the deleterious effects of neighborhood disadvantage. Examining factors that influence this relation, such as the ethnic or cultural make-up of the neighborhood, is important to understand how to best address the needs of immigrant and non-immigrant Latino youth.

Second, proportion of time spent in the US was not associated with symptoms of anxiety or depression. This is in contrast to previous research on the “immigration paradox,” which suggests that vulnerability to developing mental health symptoms increases as Latinos spend more time residing in the United States (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 2000; Coll & Marks, 2011; Gfoerer & Tan, 2003; Vega et al., 2004; Warheit et al., 1996). Future research should examine immigration factors, such as acculturation stress (Padilla, Alvarex, & Lindholm, 1986), and cultural factors, such as maintaining a collectivist attitude (Varela & Hensley-Maloney, 2009), to better understand the role of time in the US on mental health outcomes.

Limitations

This study provided the opportunity to study a sample of inner-city Latino adolescents and overcomes several barriers associated with conducting research with this population, such as providing a Spanish version of consent forms and surveys to parents and participants and working with a school to ensure parents and participants were comfortable with the research study regardless of their immigration status. Although time spent in the United States was included in the analyses, future research should consider including other within-group differences among this heterogeneous population, such as country-of-origin and acculturation factors (e.g., attitudes, values, and beliefs; Cabassa, 2003), in order to better understand these relations among Latino youth. Also, the current sample was recruited from a charter high school

that is free to the public, with an emphasis on improving youths' academic, occupational, and social outcomes. While this may have resulted in a more diverse neighborhood sampling from across the city in which this school resides, it is noted that the parents of these students sought out a different school system than that being offered by the public schools. The families sending their children to this particular school may differ from other families in their community by seeking out a school focused on college readiness and academic success. Therefore, future research may wish to examine these relations in Latino youth attending public and private schools, as well as clinical samples, in order to better understand these relations across Latino youth.

In addition, given the cross-sectional study design, causal relationships are unknown. In particular, research should continue to examine the relation between health behaviors and internalizing symptoms to better understand whether one is a more powerful predictor of the other. Sleep problems may be a form of symptom expression among youth with depression and anxiety. This poses challenges to interpreting sleep problems as a separate construct from the outcome variables in this study. Limited research has longitudinally examined sleep in predicting internalizing symptoms (Smedje, Broman, & Hetta, 2001). Further exploring factors influencing sleep within the neighborhood context will aid in interpreting the role of sleep problems among youth residing in disadvantaged neighborhoods. Furthermore, although the measures of physical activity and diet are validated measures of these constructs, future research may wish to use more comprehensive measures of these constructs, such as through examining the diverse physical activities in which youth may engage as well as a range of foods consumed. Research may also wish to examine access to physical activity and nutritional food options in order to inform interventions targeted within inner-city communities.

Conclusions and Future Directions

Despite these limitations, this study is one of the first studies known to examine the buffering role of health behaviors in the relation between neighborhood disadvantage and internalizing symptoms among Latino adolescents. A number of intervention and policy implications may be considered based on these results in order to meet the needs of this growing population of youth. For instance, findings suggest that neighborhood disadvantage is important to consider when identifying Latino adolescents at risk for anxiety symptoms. Further, addressing sleep problems among Latino adolescents, particularly those residing in disadvantaged neighborhoods, may be an important area to consider for intervention efforts when addressing internalizing symptoms. Several studies have begun to examine the role of sleep in intervention approaches. One study examined an intervention that included cognitive therapy, sleep hygiene education, mindfulness strategies, and light box therapy and found that it improved sleep among a sample of adolescents with a history of substance use (Bootzin & Stevens, 2005). Another study found that a mindfulness intervention implemented among school-age youth residing in an underserved, urban community aided in coping responses (Mendelson et al., 2010). Further examining these and other interventions may aid in protecting youth residing in disadvantaged neighborhoods from the deleterious influences of their neighborhood. In addition, schools and community agencies working with youth may wish to consider these findings when developing programs for adolescents. For instance, schools may be an important venue in which to educate youth and their parents on adolescent sleep habits. Agencies may also wish to work with families to develop home environments that maximize sleep in youth. Since physical activity was found to relate to depressive symptoms in this sample, further research examining this relation, and considering this as a potential intervention

mechanism for Latino youth, regardless of neighborhood disadvantage, is warranted. Providing opportunities for physical activity, either through physical education, after school clubs and sports, and even in-class activities, is important for schools and youth groups to consider when developing programming for Latino adolescents in order to reduce the potential for depressive symptoms and the outcomes associated with those symptoms among this at-risk population. These findings were evident even when controlling for time in the US, however, future research should include an examination of cultural factors in order to better understand within-group differences among this growing population of youth. Considering these findings when developing policy addressing the needs of Latino youth may help promote positive youth development within this population.

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Table 1. Descriptive Statistics and Correlations of Study Variables

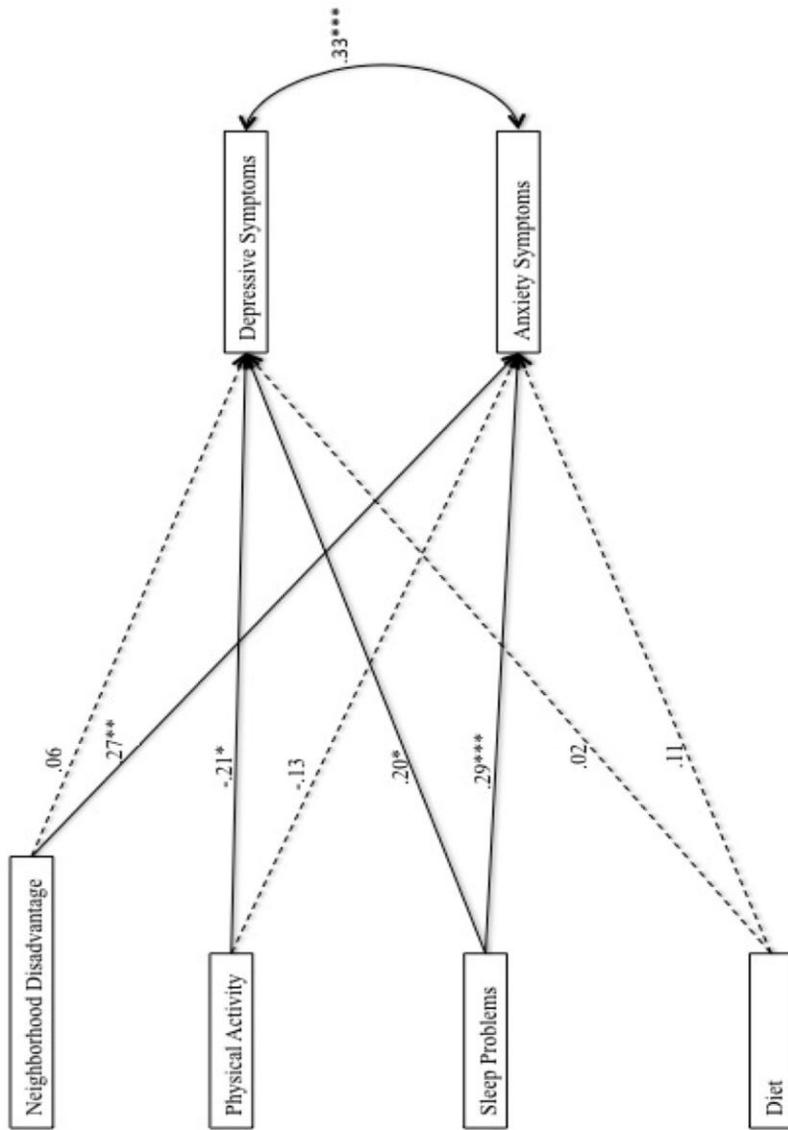
	1	2	3	4	5	6	7	8	9
1. Gender	-								
2. Age	-.10	-							
3. Time in United States	.09	-.08	-						
4. Neighborhood disadvantage	.01	-.002	.18*	-					
5. Physical activity	-.32**	-.11	.03	-.08	-				
6. Sleep problems	.15	.01	.15	.27*	.01	-			
7. Diet	-.10	.16	.05	-.05	.25**	-.05	-		
8. Symptoms of anxiety	.13	-.08	-.04	.33**	-.13	.35**	.02	-	
9. Symptoms of depression	.16	.08	-.07	.13	-.24**	.21*	-.07	.46**	-
Mean	-	16.25	.76	25.71	3.58	30.31	3.00	2.60	4.22
Std. Deviation	-	1.46	.27	7.95	2.07	7.71	1.90	2.44	3.16
Range	-	14-19	.04-1	9-45	0-7	14-55	0-8	0-9	0-13

Note. Gender (1 = males, 2 = females). * $p < .05$, ** $p < .01$

Table 2. Experiences of Neighborhood Disadvantage

Neighborhood Disadvantage Item	% Who Endorsed “Agree” or “Strongly Agree”
It is unsafe to be out after dark.	48.6
Graffiti, that is writing or painting on walls or buildings, is a problem in my neighborhood.	41
Buildings run down, not repaired is a problem in my neighborhood.	38.2
People using drugs in public places is a problem in my neighborhood.	36.8
Poor schools are a problem in my neighborhood.	33.3
People saying insulting things or bothering people as they walk around is a problem in my neighborhood.	30.8
People drinking in public places is a problem in my neighborhood.	29.9
Police not caring about neighborhood problems is a problem in my neighborhood.	24.5
It is unsafe to be on the streets during the day.	14.6

Figure 1. Path Model of First Order Effects in Relation with Internalizing Symptoms



Note. Gender, age, and time in the US were controlled for in the model. Dotted lines indicate non-significant findings and solid lines indicate significant findings. * $p < .05$; ** $p \leq .001$; *** $p < .0001$.

Figure 2. Association between Neighborhood Disadvantage and Depressive Symptoms at High and Low Levels of Sleep Problems

