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**The Interaction between Parent Perceived Stress and Ethnicity on  
Weight in Adolescents**

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**The Interaction between Parent Perceived Stress and Ethnicity on  
Weight in Adolescents**

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**Report**

Presented to the Faculty of the Graduate School of Educational Psychology

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

**Master of Arts**

**The University of Texas at Austin**

**December 2015**

## **Abstract**

### **The Interaction between Parent Perceived Stress and Ethnicity on Weight in Adolescents**

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Since obesity has a great impact on psychological and physical health, and Latino adolescents have the highest prevalence of obesity compared to adolescents of other ethnicities, there is a need to understand what contributes to this discrepancy (CDC, 2012; Must & Strauss, 1999; Ogden et al., 2014). The purpose of this study is to investigate some of the potential causes of adolescent weight and obesity; specifically how family stress and ethnicity interact to influence adolescent weight, and thus obesity. Other variables that may be involved, such as parent preferred language, parent education level, and the adolescent's sex, are examined as well.

This document proposes recruiting parent and adolescent dyads from a variety of primary care clinics around Austin when the adolescent comes in for a yearly preventive check-up. Data on parent stress, adolescent weight, adolescent ethnicity, adolescent sex, parent education level, and parent language preference are collected. These variables will

be examined to investigate the hypothesis that the weight of Hispanic adolescents is more influenced by family stress (as measured by parent stress level) than the weight of adolescents of other ethnicities.

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## **Introduction**

The United States is currently facing an obesity epidemic. The rate of adolescent obesity has quadrupled in the last 30 years to nearly 21% of the population (Ogden, Carroll, Kit, & Flegal, 2014). Among ethnic groups Hispanic adolescents have the highest prevalence with 22.4% of Hispanic adolescents being obese (Ogden et al., 2014). Childhood overweight (a Body Mass Index or BMI greater than 85% of the population) and obesity (a BMI greater than 95% of the population) are related to a wide variety of illnesses (CDC, 2012). In fact, obesity in childhood affects almost all organ systems in the body (Must & Strauss, 1999). Furthermore, these health conditions are associated with fatigue and daytime sleepiness, as well as psychological correlates such as low self-esteem and stigmatization by peers (Must & Strauss, 1999; Vgontzas, Bixler, & Chrousos, 2006). Must & Strauss (1999) suggested that there are few problems that impact childhood emotional development to the same extent as childhood obesity.

Childhood obesity also has implications for health in adulthood. Obese children and adolescents are more likely to become obese adults, which is more likely to be severe if one was obese as a child (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001; Serdula et al., 1993; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Pediatric obesity may reduce overall life expectancy (Dietz & Robinson, 2008; Kelsey, Zaepfel, Bjornstad, & Nadeau, 2014). Obesity in adults is associated with many of the most common causes of preventable death such as heart disease, stroke, type 2 diabetes, and certain types of cancer (CDC, 2012).

Beyond the great costs to health and wellness, Cawley & Meyerhoefer (2011) estimated the national medical care costs of obesity-related illnesses in adults to be \$209.7 billion, which does not account for any cost associated with lost productivity and reduced life span associated with obesity-related illnesses (Wang, McPherson, Marsh, Gortmaker, & Brown, 2011). President Obama identified obesity as a national health priority due to the health and economic costs associated with it (CDC, 2012; Garasky, Stewart, Gundersen, Lohman, & Eisenmann, 2009).

Because of this national interest, many research efforts are focused on better understanding childhood obesity. The etiology of childhood obesity has proven to be complex, expanding beyond caloric intake and energy expenditure (Eisenmann, 2006). Variables such as environmental factors in utero, reduced sleep, increased psychosocial stress (such as anxiety), and decreased energy expenditure all have implications for increased weight (Eisenmann, 2006). A wide body of literature implicates one of these variables, stress, as having a strong connection to weight gain (Wilson & Sato, 2013). Although the mechanism is not well understood, it is possible that the chronic hypersecretion of cortisol accompanying stress, which is known to increase appetite, may be one explanation (Garasky, Gundersen, Stewart, Eisenmann, & Lohman, 2012). Increased stress may also be related to other variables linked to obesity, such as poor eating habits and lower physical activity levels (Gundersen et al., 2008).

One type of stress that children are exposed to is family stress, often associated with economic strain and family conflict (Garasky et al., 2009). Parent stress is a specific type of family stress, which some studies have shown to be linked to obesity in children

even when controlling for the child's own individual stress level (Wilson & Sato 2013). Garasky et al. (2009) found that the impact of family stressors on weight has a differential impact according to the child's age, indicating a need to understand how family stress affects obesity at different developmental stages.

Although family stress and ethnicity both have a wide body of literature indicating a relation to obesity, few studies have examined the possibility of an interaction between these two variables when investigating obesity (Shankardass et al., 2014). One such study found that parental stress had a greater effect on BMI in Hispanic children aged 5 to 10 years than in children of other ethnicities (Shankardass et al., 2014). Aspects of Hispanic culture, such as *familismo*, collectivist culture, acculturative stress, and potential increased stress due to immigration or immigration status, may explain this relation (Davila, Reifsnider, & Pecina, 2011; Shankardass et al., 2014). No research, however, has yet examined whether the same relation holds up in adolescents.

Adolescents are exposed to the same family stressors as children, but due to their developmental stage they are likely more aware of the long-term impacts of such stressors and thus more sensitive to the signs of stress in the family (Garasky et al., 2009). Given this context, the differential impact of parent stress on obesity according to ethnicity may be supported and even heightened in adolescents as compared to children.

Since adolescent obesity often leads to adult obesity and adult obesity is implicated in a myriad of unfavorable outcomes including increased mortality, every effort to remove or mitigate the effects of obesity is essential (Kelsey et al., 2014). A greater understanding of the relation, and possible effect of family stress on obesity, and

how this effect may vary by ethnicity in adolescents would provide information to inform interventions as well as to incentivize targeted support through public policy to these populations. The purpose of this study will be to study the possible impact of family stress on obesity in Hispanic adolescents, with a particular focus on whether this impact is greater than that found for adolescents of other ethnicities.

## **Integrative Analysis**

### **THE OBESITY EPIDEMIC IN THE UNITED STATES**

The United States is currently facing an obesity epidemic, which drastically affects the number of preventable deaths and the quality of life of children and adults. 78.6 million adults are obese, more than one-third of the adult population (Ogden et al., 2014). 32% of children and adolescents are considered to be overweight, defined as having a Body Mass Index (BMI) of 85% to 94% according to their sex and age (Barlow & Expert Committee, 2007; Ogden et al., 2014). 17% of children and adolescents are considered to be obese, defined as having a BMI of 95% or greater according to their sex and age (Barlow & Expert Committee, 2007; Ogden et al., 2014). Of great concern, adolescent obesity rates have quadrupled in the last 30 years to nearly 21% of the population (Ogden et al., 2014).

### **NEGATIVE OUTCOMES OF OBESITY**

#### **Implications for health in children and adolescents**

Overweight and obesity are related to a wide variety of illnesses in children and adolescents (CDC, 2012). These include risk factors for cardiovascular disease such as high blood pressure and high cholesterol; an increased risk of diabetes and prediabetes, such as impaired glucose tolerance, insulin resistance, and type 2 diabetes; sleep apnea, asthma, and other breathing problems; joint problems and musculoskeletal discomfort; and other concerns such as increased intracranial pressure, fatty liver disease, gallstones, and heartburn (CDC, 2012; Must & Strauss, 1999). In fact, obesity in childhood affects almost all organ systems in the body (Must & Strauss, 1999). Another correlate of obesity that impacts both physical and psychological health is fatigue and daytime

sleepiness (Vgontzas et al., 2006). Likely related to sleep apnea and sleep disruption resulting from obesity, fatigue is associated with a reduction in physical activity, which is associated with negative physical and mental health outcomes (Vgontzas et al., 2006).

Of equal concern to the physical health implications are the psychological correlates often present in children with overweight and obesity. Children who are obese are more likely to experience teasing and discrimination by peers and adults and often suffer from low self-esteem (Must & Strauss, 1999; Office of the Surgeon General, 2010). Obese children are least likely to be desired as friends (Must & Strauss, 1999). Must & Strauss (1999) indicated that there are few problems in childhood that impact childhood emotional development to the same extent as childhood obesity, pointing to studies that have shown that people with overweight are most likely to be described as lazy, lying, cheating, sloppy, dirty, ugly, and stupid by others.

### **Longitudinal implications of childhood obesity for health**

There is still little information on the long-term effects of childhood obesity when controlling for the effects of adult obesity, although some studies indicate that pediatric obesity may reduce overall life expectancy (Dietz & Robinson, 2008; Kelsey et al., 2014). However, the literature has clearly established that children and adolescents who are obese are more likely to become obese as adults and obesity in adulthood is likely to be more severe if one is obese as a child (Freedman et al., 2001; Serdula et al., 1993; Whitaker et al., 1997). Obesity in adults is associated with many of the most common causes of preventable death such as heart disease, stroke, type 2 diabetes, and certain types of cancer (CDC, 2012). Unadjusted for adult BMI, childhood overweight is

associated with diseases in adulthood such as hypertension, coronary artery disease, and type 2 diabetes (Park, Falconer, Viner, & Kinra, 2012). Kelsey et al. (2014) listed other disorders associated with obesity in adults, including metabolic syndrome, obstructive sleep apnea, nonalcoholic fatty liver disease, polycystic ovarian syndrome, infertility, asthma, orthopedic complications, psychiatric disease, and increased rates of cancer, among others. Early-onset of these disorders in childhood is associated with a higher likelihood of early morbidity and mortality (Kelsey et al., 2014).

### **The economic cost of obesity in the United States**

Not only do overweight and obesity have serious health implications, but they also have a large economic cost. Cawley & Meyerhoefer (2011) estimated that the national medical care costs of obesity-related illnesses in adults to be \$209.7 billion. Wang et al. (2011) projected that the combined medical costs associated with the treatment of obesity will increase \$48–66 billion/year in the United States by 2030. These medical care cost estimates do not include any cost associated with lost productivity and reduced life span associated with obesity-related illnesses, which adds further economic burden (Wang et al., 2011). Because of the huge health and economic cost associated with obesity and the increase in childhood obesity in the United States in the previous 30 years, it has been identified as a national health priority by President Obama, resulting in the creation of programs such as *Let's Move* (CDC, 2012; Garasky et al., 2009).

## **DIFFERENCES IN OBESITY RATES AMONG RACIAL/ETHNIC GROUPS IN THE UNITED STATES**

This section begins with a definition of terms. Race refers to the shared biological characteristics of a population, which include skin color, bone structure, and eye color, among others (Caprio et al. 2008). Ethnicity, on the other hand, refers to a shared culture, such as language, ancestry, religious traditions, dietary preferences, and history (Caprio et al., 2008). Although people within the same ethnicity often share similar biological characteristics, the term is intended to emphasize shared cultural and social characteristics rather than shared genes (Caprio et al., 2008). The term “ethnicity” will be used in this study to refer to the Latino/Hispanic population in the United States, to reflect the great genetic diversity of those that identify as Latino/Hispanic. This is evidenced by the fact that Latinos in the United States trace their family origins to more than 20 Spanish-speaking countries around the world (Lopez, Gonzalez-Barrera, & Cuddington, 2013).

Although there is concern for the increasing rates of childhood obesity in all ethnic and racial groups, its prevalence is higher in minority populations (Caprio et al., 2008). Latino and black children, as well as children in low-income families, are at a greater risk than white children of overweight and obesity (Wilson & Sato, 2013). The rate among Hispanic adolescents, in particular, is troubling as the rate of obesity is 22.4%, higher than any other racial or ethnic group of adolescents (Ogden et al., 2014). This high rate of obesity in Latinos is not limited to adolescents; the rate of obesity in Hispanic adults (42.5%) is higher than that of the general population (34.9%) (Ogden et al., 2014).

As the etiology of obesity is complex, the reasons for the different rates of obesity among different racial and ethnic groups are not easily explained and still not fully understood (Caprio et al., 2008). Potential explanations include genetics, physiology, culture, socioeconomic status (SES), environment, and potential interactions between these variables (Caprio et al., 2008). Another potential explanation is the increased stressors within particular racial and ethnic groups, which may be related to increased overweight and obesity, as indicated above.

### **THE COMPLEX ETIOLOGY OF OBESITY**

With a national focus on childhood obesity, researchers continue to gain understanding of the etiology of obesity, realizing that it is far more complex than a subtraction of caloric intake from energy expenditure (Eisenmann, 2006). Although total caloric intake is unchanged since the 1960s, there has been increased simple sugar consumption and decreased calcium intake, which are both related to adiposity (Eisenmann, 2006). Variables such as environmental factors in utero, reduced sleep, increased psychosocial stress (such as anxiety), genes, community resources, and decreased energy expenditure all have implications for increased weight (Eisenmann, 2006).

### **Measuring obesity in children and adolescents**

BMI is calculated from a child or adolescent's weight and height (CDC, 2014). Although it is not a direct measure of body fat, BMI is correlated to direct measures of body fat in multiple studies, indicating its validity as a measure of body fat in the majority of children and adolescents (CDC, 2014). Since it requires little time and few

resources, such as a scale and height measure, to obtain, it is an ideal measure to use as an indicator of obesity in children and adolescents. However, what are healthy and unhealthy BMIs change throughout childhood and adolescence due to changes in the healthy level of body fat over this time of development; thus BMI itself is not necessarily an accurate representation of adiposity in children and adolescents (CDC, 2014). There is also a difference in healthy levels of body fat between male and female children and adolescents (CDC, 2014). For these reasons, an age- and sex-adjusted measure of adiposity is needed to accurately indicate healthy and unhealthy levels of body fat.

There are two typical ways to measure age- and sex-adjusted adiposity in children and adolescents: BMI percentile and BMI z-score (Cole, Faith, Pietrobelli, & Heo, 2005). These both are determined by data from the 1970s, before the obesity epidemic, to compare a child or adolescent's BMI to those of the same age and sex in order to indicate if it is within healthy limits or not (Han et al., 2008). Cole et al. (2008) found that BMI z-score is the best measure of adiposity on a single occasion.

### **Stress and obesity**

Stress is defined as the physical, emotional, and behavioral response to threatening stimuli (Wilson & Sato, 2013). Although it is not yet well understood, current research implicates stress as one variable that contributes to weight gain (Wilson & Sato, 2013). When one continually experiences stressful situations, chronic stress or stress pile-up can occur (Garasky et al., 2009). This type of stress is commonly seen with financial, job-related, or family relationship strain (Wilson & Sato, 2013). In adults, a substantial body of literature has shown a connection between chronic stress and obesity

(Wilson & Sato, 2013), but there is much less evidence of the connection in children and adolescents, although that research body is growing (van Jaarsveld, Fidler, Steptoe, Boniface, & Wardle, 2009; Wilson & Sato, 2013). What research that has been done in this area links higher levels of stress to adiposity in both children and adolescents (Wilson & Sato, 2013).

One explanation for the relation between increased stress and increased rates of obesity is the chronic hypersecretion of cortisol that accompanies chronic stress (Garasky et al., 2012). These increased cortisol levels are known to enhance appetite and decrease leptin resistance (both associated with adiposity), which may be a mechanism for triggering overeating (Garasky et al., 2012). Furthermore, increased stress may be related to other variables linked to obesity such as poor eating habits and lower physical activity levels (Gundersen, Lohman, Garasky, Stewart, & Eisenmann, 2008).

This complex relation between stress and weight may be considered within the theoretical framework of the ecological systems theory (Bronfenbrenner, 1979). This theory conceptualizes human development as being the result of continual interaction between children and their environment, not only the immediate environment but also the greater context within which children and their immediate environment are embedded (Bronfenbrenner, 1979). Ecological systems theory describes five nested systems, which are continually interacting with each other: the individual, microsystems, mesosystems, exosystems, and macrosystems. The microsystems are the immediate environment of the child, such as home, family, and church; the mesosystems are the interactions between the microsystems, such as a parent's involvement in the child's school; the exosystems

are the environments that do not immediately interact with the child, but interact with the child's microsystems, such as a parent's job; and the macrosystems are the greater context within which all of these systems are embedded such as society, culture, laws, and government (Bronfenbrenner, 1979). This theory provides a basis for understanding the adolescent's complex interaction with the surrounding environment, including the myriad of ways that family stress could be implicated in the adolescent's daily life. From the scarcity of healthy food to the increased cortisol response in the adolescent when concerned about a parent's job, the ecological systems theory creates a context for understanding how far-reaching family stressors can potentially influence adolescent adiposity. This theory suggests stress to be the influencing variable in the relation between weight and stress.

### **Family stress and obesity**

One specific type of stress that children are unable to avoid is the level of family stress in their home, or microsystem (Bronfenbrenner, 1979). This type of chronic stress is often associated with economic strain and family conflict (Garasky et al., 2009). In Latino families, this may include intergenerational cultural differences and family separations associated with immigration (Cervantes & Cordova, 2011). Although chronic stressors and obesity in adults have been strongly linked in the literature, as mentioned above, insufficient research has been done to show the linkages between chronic stress and obesity in children (Garasky et al., 2009; van Jaarsveld et al., 2009; Wilson & Sato, 2013). Since stress associated with the family is the most likely source of chronic stress in children, the relation between family stress and obesity merits further study.

Research that has been done on the relation between stress and obesity in children has indicated a likely increased risk of obesity in children due to family stress, beyond the risk of obesity created by a child's individual stress level (Wilson & Sato 2013). One specific type of family stress is the parent's level of stress, which some studies have shown to be linked to obesity in children (Lohman, Stewart, Gunderson, Garasky, & Eisenmann, 2009 ; Shankardass et al., 2014). Shankardass et al. (2014) found increased parent stress to be associated with increased BMI in children at age ten and with an increased trajectory of weight gain in following years. Lohman et al. (2009) found that the likelihood of adolescents who are food insecure to be overweight or obese increased with an increase in maternal stressors. Furthermore, the higher level of family stress experienced by low SES families might help to partly explain the long-established connection between socio-economic status (SES) and obesity (Barlow & the Expert Committee, 2007; Singh, Kogan, Van Dyck, & Siahpush, 2008). These data provide support for a positive relation between parent stress and childhood obesity.

There are many potential explanations for the connection between family stress and childhood obesity. As noted previously, increased cortisol levels in children are associated with family stress, which has a strongly established link to obesity in the literature (Garasky et al., 2009). Another potential explanation is that high levels of stress in families may result in consumption of cheap and easy but unhealthy food, and lower levels of physical activity, both of which are associated with a greater risk for overweight and obesity (Garasky et al., 2009). Furthermore, chronic stress in adolescents may stimulate visceral fat accumulation, increasing abdominal obesity (De Vriendt,

Moreno, & Henauw, 2009). For these reasons, and possibly others, family stress may increase the likelihood of overweight and obesity in children and adolescents.

Garasky et al. (2009) found that the impact of family stressors on weight has a differential impact according to the child's age. Specifically, the family stress variables Garasky et al., (2009) found to be associated with overweight and obesity in young children were a lack of cognitive stimulation and emotional support, and among older children the greater risk factors were financial strain in the household or living in the same household as people with mental or physical health problems (Garasky et al., 2009). Garasky et al. (2009) postulated that the association may be due to the older children's more advanced cognitive capacities which allow for them to be more cognizant of the implications of financial and health stressors, thus leading to increased stress in the child (Garasky et al., 2009). These differential impacts of family stress, as well as the child's and adolescent's developmental differences, indicate a need to understand how family stress may affect obesity at different developmental stages.

### ***Measuring Family Stress***

Stress is a difficult variable to measure. Research assessing chronic stress is generally non-experimental, as inducing chronic stress would violate ethical concerns (De Vriendt et al., 2009). Researchers use both objective and subjective measures to assess a person's level of stress (Garasky et al., 2012). Objective stress measures include measuring cortisol levels and other physiological stress indicators as well as observing stressors in the individual's environment (Garasky et al., 2012). Subjective measures of stress include directly asking the individuals to indicate or rate their level of stress or

their response to a stressor (Garasky et al., 2012). Objective measures have the advantage of being a more direct measure of stress, with fewer concerns for social desirability bias impacting the participants' responses and therefore the accuracy of the data (van de Mortel, 2008). However, these measures are more expensive and sometimes are even stress-inducing themselves, affecting their validity as an accurate measure of stress (van de Mortel, 2008). Cortisol levels are also subject to circadian rhythms with normal fluctuations throughout the day, making them difficult to interpret (De Vriendt et al., 2009). Subjective measures such as questionnaires and checklists are easy to administer, require little time from the participant or researcher, and are generally less costly to administer to a large sample (De Vriendt et al., 2009). However, they do have the disadvantage associated with self-report measures of social desirability response bias (De Vriendt et al., 2009). Validity of stress scales is variable, depending on the scale. Many scales have strongly established validity, such as life events, coping abilities, and personality being predictive of perceived stress scores (Cohen & Williamson, 1988).

## **OTHER VARIABLES IMPLICATED IN THE RELATION OF STRESS AND ADOLESCENT OBESITY**

### **The sex of the adolescent**

Among adolescents, boys and girls have the same rates of overweight and obesity (Garasky et al., 2012). However, there has been little research done on the interaction between stress and sex on weight in adolescents (Garasky et al., 2012). Van Jaarsveld et al. (2009) have investigated this relation and found that there were no differences in the effect of perceived stress on weight gain. Pastor and Reuben (2011) found that there was a connection between emotional/behavioral difficulties and the weight of males and

females, but only when also considering race and ethnicity. Furthermore, the literature on differential coping with stress according to sex has been inconclusive, with some studies showing gender differences with coping and others showing no gender differences (Garasky et al, 2012). Research does show some gender differences in eating-related responses to stress: adolescent girls are more likely to respond to stress with disordered eating compared to adolescent boys and women have higher levels of “emotional eating” compared to men (Garasky et al, 2012). The contradictory and incomplete literature in this area provides no substantial indication of sex playing a role in the relation between chronic stress and obesity in adolescents.

### **The parent’s primary language**

A preference for Spanish over English is likely an indicator of immigration status and potentially an indicator of a person’s level of acculturation. A lack of comfort in English is also likely associated with increased challenges in navigating everyday life and consequently increased levels of stress (Cervantes & Cordova, 2011). A study of Latino adolescents, 60% of whom endorsed Spanish as their primary language, indicated having language-related stress, including not knowing the English language, challenges in learning a new language, and feeling isolated because of their limited knowledge of the dominant language (Cervantes & Cordova, 2011). The Spanish-speakers in this study indicated feelings of hopelessness and insecurity as well as endorsing English language learning to be difficult and stressful (Cervantes & Cordova, 2011). Although this study was specific to adolescents, other studies have found similar results for adult Spanish language speakers.

Torres (2010) found that the challenge faced by immigrants of adopting the cultural values of the United States, as well as the difficulty of learning a new language and being able to communicate oneself effectively, significantly increased the likelihood of stress, depression, and other psychological correlates (Torres, 2010). Furthermore, with many Latino immigrants having low educational attainment, including illiteracy, the task of learning a new language may be particularly intimidating (Torres, 2010; Vega & Sribney, 2003). Overall, the challenge of being a non-English speaker in a primarily English-speaking society, and the pressures to learn the English language, may be an increased source of stress for primarily Spanish-speaking parents.

The English-language competence of parents may also affect the stress level of their children. English-speaking children who translate for their non-English speaking parents endorse stressors related to the task (Cervantes & Cordova, 2011). This responsibility places these children in roles that are not typical of family dynamics, with the child becoming the interface between the family and the outside world. Also, children with monolingual Spanish parents are more likely to report acculturation conflict with their parents, due to their parents desiring that the child retain the family's Hispanic cultural values (Cervantes & Cordova, 2011). Cervantes and Cordova (2011) also found, in their study of Hispanic adolescents, that those who spoke Spanish were more likely to have substance abuse within their family. These data suggest that not only does parent language affect the stress of the parent, but also it has implications for overall family stress and for adolescent stress, as well as a relation to other variables with implications for family stress.

### **The parent's education level**

Parent education level is often used as an indication of SES (Singh et al., 2008). A wide body of research not only indicates a negative correlation between social status and obesity, but more broadly that people of a lower social status have worse health and higher mortality rates (Moore, Solveig, & Cunningham, 2012). In a review of fourteen articles on psychological stress, obesity, and social position (which they measure using education, income, and occupational prestige), Moore et al. (2012) found that lower stress levels, healthier eating patterns, and lower body weight were all more likely in those of higher status positions. Possible explanations for this relation include the access to more resources such as medical care and nutritious food that are enjoyed by people of high SES, and the lower amounts of reported stress among that same population due to fewer chronic psychosocial stressors in their environment (Moore et al., 2012). Moore et al. (2012) proposed the status syndrome hypothesis as another explanation, which posits that for wherever one is on the SES spectrum, the psychological and social pressures of social position will cause people to be of better health than those below them in SES and of worse health than those above them. Regardless of the reason, the relation between SES and health, specifically obesity, is firmly established in the literature.

### **OBESITY, ETHNICITY, AND PARENT STRESS**

As discussed, obesity's etiology is likely a complex interplay between biological, behavioral, and environmental factors. The literature has established a relation between family stress, including parent stress, and obesity (Garasky et al., 2009; Koch, Sepa, & Ludvigsson, 2008; Moens, Braet, Bosmans, & Rosseel, 2009). Furthermore, there are discrepancies in the prevalence of obesity among different racial and ethnic groups, with

nonwhite populations experiencing higher rates of overweight and obesity (Caprio et al., 2008). Recent research indicated an interaction between ethnicity and parent stress in overweight and obesity rates; Shankardass et al. (2014) found that parental stress had a greater effect on BMI in Hispanic children aged 5 to 10 years old than in children of other ethnicities. The interaction between parent stress and ethnicity on obesity may serve as an explanation for these discrepant obesity rates.

Hispanic populations in particular seem to have a strong link between family stress and obesity, a connection that needs to be investigated further due to the high rates of obesity in this population. Aspects of Hispanic culture, such as *familismo*, collectivist culture, and potential increased stress due to immigration or immigration status, may help explain this relation (Davila, Reifsnider, & Pecina, 2011; Shankardass et al., 2014).

Collectivist cultures emphasize family solidarity, interdependence among family members, group activities, and preference given to group rather than individual interests (Guo, Li, Liu, & Sun, 2015). *Familismo*, defined as the importance of family and which describes the cultural sense of responsibility to support the well-being and unity of one's family, is an example of the collectivist nature of Latino culture (Davila et al., 2011).

Davila et al. (2011) indicate three facets of *familismo*: an obligation to the family to provide financial and emotional support, a reciprocal reliance on family for support, and the use of family members as a reference point for attitudes and behaviors. These values have implications for health behavior in Latinos, in that their health behaviors will be driven by family needs, with all decisions being made in the context of the family (Davila et al., 2011).

Other variables that may help to explain the differential impact of family stress on obesity according to ethnicity is the experience of immigration and acculturative stress by many in the Latino community. These stressors include experiences of loss from having to leave family members behind in the old country, experiences of isolation from being without family and friends in the new country, experiences of discrimination, and challenges experienced during the process of emigrating to the United States (Cervantes & Cordova, 2011). As mentioned above, recent immigrants and their families face higher levels of acculturation differences in cultural values and beliefs between children and parents (Cervantes & Cordova, 2011). Acculturation stress often leads to increased conflict in families, as those parents are more likely to want their children to maintain their cultural values than Latino parents who are not recent immigrants (Cervantes & Cordova, 2011). Some research has found acculturative stress to be implicated in poor mental health, but the research is inconsistent due to the varying ways that acculturative stress is measured (Torres, 2010). However, there is enough research to support the idea that the stressors of being an immigrant in the United States – including the inherent pressures, experiences of loss and isolation, experiences of discrimination, and experience of devaluation of one’s ethnic group – increase the likelihood of mental health problems (Torres, 2010). The prevalence of these stressors in the Latino community serves as a potential explanation for its high rate of obesity (Shankardass et al., 2014).

No research, however, has yet been done to see if the same relation holds in adolescents. Adolescents are exposed to the same family stressors as children, and because of their developmental stage they may, in fact, be more aware of the long-term

impacts of such stressors and more sensitive to the signs of stress in the family (Garasky et al., 2009). Given this context, the differential impact of parent stress on obesity according to ethnicity may be supported and even heightened in adolescents as compared to children. Multiple studies call for further understanding of how stressors within the family environment relate to weight status in children and adolescents, and the relation between this stress and the multiple variables implicated in obesity, including SES and race and ethnicity (Garasky et al., 2009; Shankardass et al., 2014; Wilson & Sato, 2013).

Since adolescent obesity is a predictor of adult obesity and adult obesity is implicated in a myriad of unfavorable outcomes including increased mortality, every effort to reduce obesity and mitigate its effects is essential (Kelsey et al., 2014). A better understanding of the relation between family stress, obesity, and ethnicity in adolescents would provide information to inform interventions in the populations as well as to incentivize targeted support through public policy to these populations.

## **Proposed Study**

### **PROBLEM STATEMENT**

The present study is designed to further understand the complex etiology of overweight and obesity. Stress has been shown to influence weight in adults and children. Furthermore, overweight and obesity have different levels of prevalence in different ethnic and racial groups. Parent perceived stress has been shown to influence weight more in Hispanic children than in other racial/ethnic groups, but no research has been conducting with adolescents to investigate whether parent perceived stress influences weight differentially according to ethnic group. A greater understanding of the possible influence of parent perceived stress and ethnicity on adolescent weight would likely improve treatment of adolescent overweight and obesity.

It is important to note that the data used in this research will be nonexperimental in nature; there will be no experimental manipulation of family stress to determine its effect on adolescent weight. As a result, it should be understood that all research questions that follow and statements that discuss the “effect” or “influence” of one variable on another, or that focus on variables that “explain” an outcome are dependent on the validity of the model. In other words, if the model is a reasonable representation of reality, the estimates resulting from the model indeed show the extent of the influence of one variable on another. If the model is not a reasonable representation of reality, the estimates are not accurate estimates of those effects (adapted from Keith, 2015, p 172).

### **RESEARCH QUESTIONS AND HYPOTHESES**

**Research Question #1.** Is parent perceived stress related to adolescent weight?

***Hypothesis for question #1.*** Parent perceived stress is positively related to adolescent weight.

***Rationale.*** Multiple studies show a positive relation between stress and weight (Koch et al., 2008; Shankardass et al., 2014; Sominsky & Spencer, 2014). Family stress, including perceived parental stress, is no exception, with strong support in the literature for a connection between family stress and increased weight in the child (Garasky et al., 2009; Shankardass et al., 2014).

**Research Question #2.** Do parent language preference and parent education level influence adolescent weight? Does parent perceived stress mediate any effect between these variables and adolescent weight?

***Subhypothesis 1 for question #2.*** Parent preference for Spanish over English will result in an increase in adolescent weight. Parent perceived stress partially mediates this effect.

***Rationale.*** Learning a new language is challenging and associated with increased psychological correlates, especially since many recent immigration groups have low educational attainment (Torres, 2010; Vega & Sribney, 2003). In one study of self-identified Latino/a participants, English language concerns were endorsed most on a measure of acculturative stress, indicating that those language concerns are the greatest source of acculturative stress in the Latino population (Torres, 2010). This finding suggests that non-English-speaking parents are more likely to have higher levels of stress. Furthermore, non-English-speaking parents are more likely to be an immigrant to the United States, which means that the family likely faces immigration and acculturative

stress. Children of immigrants face greater exposure to stressors and are at a greater risk of depression, anxiety disorders, substance abuse, and other psychological correlates (Lamburg, 2008). This finding suggests that the adolescent's own level of stress may be higher due to their parent's language status. The parent's increased level of stress combined with the adolescent's increased level of stress may result in higher weight in the adolescent.

***Subhypothesis 2 for question #2.*** Parent education level will likely influence adolescent weight, with parents with lower levels of education having adolescents with higher weights. Parent perceived stress fully mediates this relation.

***Rationale.*** There is a strong basis in the literature for socio-economic status measures, including parent educational attainment, to be related to stress and obesity levels (Garasky et al., 2009; Shankardass et al., 2014).

**Research Question #3.** Does parent perceived stress differentially affect weight in adolescents based on ethnicity? In other words, is the weight of adolescents more influenced by parent perceived stress depending on the race/ethnicity of the adolescent?

***Hypothesis for question #3.*** It is hypothesized that parent perceived stress will influence weight in Hispanic adolescents more so than for adolescents from other ethnic groups.

***Rationale.*** Shankardass et al. (2014) found that Hispanic children gain more weight with higher levels of parental stress. Since Hispanic adolescents will be exposed to similar cultural, economic, and political influences, it is likely that they will have a similar result. Their different developmental stage may, in fact, serve to increase this

connection, as adolescents are more aware of financial and other stressors that their parents face, which in turn will exacerbate the influence of their parents' stress.

**Research Question #4.** Does parent perceived stress differentially affect weight in adolescents according to the adolescent's sex?

**Hypothesis for question #4.** Parent perceived stress does not differentially influence adolescent weight according to the adolescent's sex.

**Rationale.** Pastor & Reuben (2011) found that emotional/behavioral difficulties influenced the weight of males and females differentially when considering race and ethnicity, but provide no evidence for differences when race and ethnicity is not considered. No other evidence could be found for psychological variables to influence adolescent weight differentially by sex.

## **METHOD**

Parents of adolescents will be asked to fill out a demographic information sheet and a perceived stress questionnaire. Information will be collected from the adolescent's medical chart to create an age-adjusted measure of adolescent weight. Parent responses, including their perceived stress score, a measure of socioeconomic status, and the adolescent's race/ethnicity, will be compared to adolescent weight to assess for psychological, social, and economic variables that may affect adolescent weight.

**Participants.** 150 adolescents between the ages of thirteen and seventeen years old, 75 male and 75 female, and one of their parents will be recruited for this study. The sample size was determined by a power analysis using G\*power, as described in the *Preliminary Analyses* section below. Only those teens and their parents presenting for a

well-child check up will be recruited. Adolescents presenting for acute care visits will not be recruited because of the possibility of artificially elevated levels of stress due to illness or injury. Participants will be recruited from three Austin-area primary care clinics. In order to recruit a diverse sample, clinics are geographically, economically, and racially diverse. One clinic is located in central Austin and provides care to underserved populations; another is located in a suburban area close to Austin and provides care to an economically and racially diverse population; the final clinic is located in a higher income area of Austin and provides care to primarily middle to high socio-economic status patients. For their participation, the families will be entered into a drawing for six \$25 gift certificates to Target.

**Measures.** Parent perceived stress will be assessed using the Perceived Stress Scale (PSS). This is a widely used self-report measure of a person's experience of stress; that is, how stressful respondents perceive their lives to be, and whether they consider it to be unpredictable, uncontrollable, or overloading (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988; Roberti, Harrington, & Storch, 2006; Taylor, 2014). Rather than asking about a specific stressful situation, the PSS is intended as a global measure of one's appraisal of stressful life events, worries about the future, or concerns for stressful events in the lives of others (Cohen & Williamson, 1988). The PSS asks questions like "In the last month, how often have you found that you could not cope with all the things that you had to do?" and "In the last month, how often have you felt confident about your ability to handle your personal problems?" on a 5-item Likert scale ranging from "Never" to "Very Often" (Cohen & Williamson, 1988).

Subsequent studies of the psychometric properties of this 14-item measure have been consistent with Cohen and Williamson's (1988) original psychometric analysis, with coefficient alpha measures from three different samples (332 college students at the University of Oregon, 114 members of an introductory personality psychology class, and 64 participants of a smoking cessation group) of .84, .85, and .86 (Cohen & Williamson, 1988). Construct validity has been supported for this measure as well (Cohen & Williamson, 1988; Roberti et al., 2006).

The psychometric properties of the Spanish language version of the Perceived Stress Scale (PSS) have not been assessed among immigrant populations in the United States, but have been assessed in Mexico (Gonzalez & Landero, 2007). Remor (2006) originally developed the Spanish-language version for a European population. In an initial analysis of this measure for a Mexican population, not all items performed well (Gonzalez & Landero, 2007). Considering this finding, a cultural adaptation of the Remor translation was conducted and an evaluation of this adaptation's psychometric properties in a Mexican sample was satisfactory (Gonzalez & Landero, 2007). Internal consistency was good ( $\alpha=.83$ ) and factor structure was supported using confirmatory factor analysis (Gonzalez & Landero, 2007).

There are multiple versions of this measure: 14-item, 10-item, and four-item versions (Taylor, 2014). The Remor translation of the PSS, which has 14 items, is the only Spanish language version of this measure that has been psychometrically validated that could be found (Remor, 2006). The 10-item English version has stronger psychometric properties than the 14-item English version (Taylor, 2014). Since the 10-

item English PSS is stronger psychometrically, but there is no 10-item validated version in Spanish, the 14-item measure of both the English and Spanish versions of the scale will be administered. After administration is complete, the psychometric properties (Cronbach's alpha) of both the English and Spanish, 10- and 14-item versions will be assessed. Whichever version, the 10- or 14-item, proves to be the most psychometrically sound in both languages will be used as the measure of parent perceived stress.

Demographic and other information related to stress and obesity (as based on the literature in this area, e.g., Shankardass et al., 2014) will be collected using a questionnaire. These demographic and other variables include the adolescent's age, sex, race or ethnicity, and parents' educational attainment. All measures will be administered using an online survey tool such as Survey Monkey or Qualtrics to ensure anonymity and reduce errors in data entry. All measures are provided in the Appendix.

## **PROCEDURE**

Following IRB approval of the study, data will be collected from 150 dyads, 75 male adolescents and a parent and 75 female adolescents and a parent; dyads will be recruited by a researcher who meets with the dyad at the beginning of the yearly well-child/preventive check up. The researcher will explain to the parent and adolescent the general purpose of the study, without mentioning that parent perceived stress or adolescent weight are being investigated, but rather that the researchers are looking at how different family factors influence health. Participants (both parent and adolescent) will be asked to fill out a consent form in order to conform to APA guidelines. The participant's parent will then be asked to fill out a demographic information form and the

PSS, in English or Spanish depending on the parent's preference. Information needed to calculate the adolescent's body mass index (BMI) z-score will be collected from the medical chart, including the adolescent's weight, height, date weight was taken, date of birth, and gender.

#### **ANALYSES AND EXPECTED RESULTS**

**Preliminary Analyses.** Preliminary analyses will be performed to diagnose any potential violations of assumptions. Descriptive statistics, including frequencies, means, standard deviations, ranges, and minimum and maximum values, will be calculated. These data will be used to look for any potential outliers. The residuals from the regression analyses will be analyzed to ensure that the data meets the assumptions of linearity, homoscedasticity, and normality. To ensure that the independence of errors assumption has not been violated, the boxplots method will be used.

A power analysis using G\*power (Version 3.1) found that an overall sample size of 49 would be necessary. This  $N$  was found using the effect size found in the Shankardass et al. (2014) study similar of  $f^2=.28$ . In order to ensure that there are at least 30 participants in each ethnic/race category that is being tested, a sample size of 150, 75 male and 75 female, will be recruited.

**Variables of Interest.** All of the research questions address the adolescent's weight and the parent's perceived level of stress. The adolescent's weight will be operationalized using their BMI z-score. Normal to unhealthy BMI ranges change according to age, so the BMI z-score, which takes into account these adjustments, is the best way to accurately represent the adolescent's weight at a single measurement point

(Cole et al., 2005). According to the World Health Organization, overweight is defined as a z-score greater than 2 and obese is defined as a z-score greater than 3 (Flegal & Ogden, 2011). Parent perceived stress will be measured using their score on the Perceived Stress Scale, either the 10-item or 14-item version depending on the strength of the psychometric properties within this sample. This scale is intended to be used as a within-sample comparison so it does not have clinical cutoffs (Roberti et al., 2006).

Research question 2 addresses the parent's language preference, which will be measured by whether the parent chooses the Spanish or English language measures. It also addresses parent education level, which is often used as a measure of the family's socio-economic status (Shankardass et al., 2014). On the questionnaire, the parent selects the highest level of education obtained and the highest level of education of the child's other parent, if applicable. The options are did not finish high school; high school graduate or GED; more than high school, but less than a 4 year degree; college graduate; MA or equivalent; and PhD, MD or other doctoral degree. These will be coded on a continuous scale. The questionnaire asks for the education level of both parents of the adolescent, if applicable, and the highest level of education reported will be used in the analyses (Winding, Nohr, Labriola, Biering, & Andersen, 2013).

Research question 3 addresses the adolescent's race/ethnicity, which is asked of the parent on the questionnaire. The options given are Asian / Pacific Islander, Black or African American, Hispanic or Latino, Native American or American Indian, White, and Other (with space to write in a response). Hispanic or Latino participants will be compared to all other categories and if there are sufficient participants identifying as

another race/ethnicity (at least 30 participants), then those race/ethnicity categories will be included in comparison as well. Research question 4 addresses the adolescent's sex, which is also asked of the parent on the questionnaire. The options are Female and Male.

### **Proposed Analyses and Expected Results.**

**Research Question 1.** Is a parent perceived stress related to adolescent weight? A Pearson correlation will be used to determine the relation between parent perceived stress and adolescent weight.

It is hypothesized that there will be a positive relation between these two variables, so that as parent perceived stress increases, adolescent weight will increase.

**Research Question 2.** Do parent language preference and parent education level likely influence adolescent weight? Does parent perceived stress mediate any effect between these variables and adolescent weight? First, the relation between parent language preference and adolescent weight will be assessed using multiple regression. Weight will be regressed on all variables: parent language, parent education level, parent perceived stress, adolescent ethnicity, and adolescent sex. Then, parent perceived stress will be regressed on parent education level, parent language and adolescent ethnicity. These two regressions will be used to calculate the possible indirect effects of parent language and parent education on weight, via perceived stress.

Sobel's test will be used to assess the statistical significance of any mediating effect of parent perceived stress on the relation between parent language preference and adolescent weight. These steps will be repeated with the variable parent education level instead of parent language preference (Keith, 2015).

It is expected that both parent's preference for Spanish over English and parent's level of education will indirectly affect their adolescent's weight. It is expected that parent perceived stress will partially mediate the relation between parent language preference and adolescent weight and will fully mediate the relation between parent education level and adolescent weight.

**Research Question 3.** Does parent's perceived stress differentially influence weight in adolescents according to ethnicity? Multiple regression will be used to test this research question. Weight will be regressed on the background variables of parent language, parent education level, and adolescent sex. A centered version of the parent perceived stress and a dummy coded ethnicity/race variable will be also be added in this block of the regression and will be used to create a cross product variable. The cross product will added sequentially to the regression and assessed for statistical significance. If the interaction is statistically significant then the variables will be graphed and a follow up of separate regressions for the different levels of the categorical variables will be conducted.

It is hypothesized that parental stress will influence Hispanic adolescents' weight more than for adolescents from other ethnic groups.

**Research Question 4.** Does parent perceived stress differentially influence weight in adolescents according to the adolescent sex? The multiple regression procedure for research question 3 will be repeated, replacing adolescent sex for adolescent ethnicity.

It is hypothesized that parental stress will not differentially influence an adolescent's weight according to the adolescent's sex.

## **Discussion**

### **SUMMARY**

Since obesity has a great impact on psychological and physical health, and Latino adolescents have the highest prevalence of obesity compared to adolescents of other ethnicities, there is a need to understand what contributes to this discrepancy (CDC, 2012; Must & Strauss, 1999; Ogden et al., 2014). The purpose of this study is to investigate some of the potential causes of adolescent weight and obesity; specifically how family stress and ethnicity interact to influence adolescent weight, and thus obesity. Other variables that may be involved, such as parent preferred language, parent education level, and the adolescent's sex, are examined as well.

This document proposes recruiting parent and adolescent dyads from a variety of primary care clinics around Austin when the adolescent comes in for a yearly preventive check-up. Data on parent stress, adolescent weight, adolescent ethnicity, adolescent sex, parent education level, and parent language preference are collected. These variables will be examined to investigate the hypothesis that the weight of Hispanic adolescents is more influenced by family stress (as measured by parent stress level) than the weight of adolescents of other ethnicities.

### **IMPLICATIONS**

Understanding the way ethnicity and family stress interact to affect adolescent weight will add to the understanding of the complex etiology of obesity. This study will also increase understanding of how variables such as SES, immigration/acclimation stress, and ethnicity may influence obesity. Results from this study could have implications for policies regarding childhood obesity, specifically providing support for

policies that help to reduce family stress in Latino communities. Furthermore, these results could influence obesity interventions for adolescents by directly addressing family stress amongst Hispanic adolescents. Parents could be taught the importance of managing family stress for their child's health, as well as working on ways for the adolescent to manage stress, such as coping skills. Also, health caregivers could more accurately target management of adolescent obesity by addressing parental stress.

#### **LIMITATIONS AND FUTURE DIRECTIONS**

A limitation of this study is that it is not a longitudinal study: weight and parent stress are measured at only one time point, and it is assumed that stress influences weight. Although no studies could be found to support this contention, it is likely that childhood obesity influences adolescent obesity, as it has been shown that childhood obesity influences adult obesity (Freedman et al., 2001; Serdula et al., 1993; Whitaker et al., 1997). In his transactional model of development, Sameroff proposed that the child and environment are involved in a complex interaction that influences the child's outcomes (Sameroff, 2009). Considering this model in the context of parent stress and weight, it is assumed that the adolescent's weight status earlier in life influenced their current weight status, and that the parent's previous stress levels and current stress levels did as well. The design of this study, although it takes into account parent stress in the previous month, does not take into account parent stress prior to the previous month or the adolescent's previous weight status. A longitudinal study of stress and obesity would allow for greater understanding of how changes in stressors influence weight, as well as addressing time-ordering concerns between stress and obesity (Garasky et al., 2009). The

benefit of this design is that it allows the inclusion of a more diverse range of participants in a shorter time span, as there is no concern for participant attrition and any selective factors involved in those participants who drop out of the study. If the results of the current study are as expected, a longitudinal study would be a logical next step in this research.

A second limitation of this research is that a low percentage (38%) of adolescents get their well-child check each year (Irwin, Adams, Park, & Newacheck, 2009).

Therefore a large percentage of the population is not represented in this study and there may be some selective factors influencing the families that do seek out well-child checks (i.e. less stress, more time, and more priority placed on health). Despite these limitations, the study design has many benefits, including its feasibility, the relatively short time demands placed on the participants, the ability to include more participants because there is no concern for limited or missing previous data, and no concerns for attrition bias.

A final limitation of this study is the use of nonexperimental data. Due to ethical concerns, no experimental manipulation of family stress is proposed. As a result, the conclusion that family stress “effects” or “influences” weight is dependent on the validity of the model proposed (adapted from Keith, 2015, p 172).

Possibilities for future research include a longitudinal study of parent stress and child weight, with the previously mentioned limitations taken into account. Considering the transactional model of development, future research could investigate how child weight and family stress present in childhood affect each other and these same variables in adolescence. This study could continue by investigating how these variables all

contribute to adult weight status. Another possibility is to investigate how specific family stressors at specific times in development influence child and adolescent weight. In summary, the complexity of the relation between weight status and family stress is not yet well understood and requires further investigation.

## Appendix A: Perceived Stress Scale (English)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

1. In the last month, how often have you been upset because of something that happened unexpectedly?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

3. In the last month, how often have you felt nervous and "stressed"?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

4. In the last month, how often have you dealt successfully with irritating life hassles?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often

4. very often

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

6. In the last month, how often have you felt confident about your ability to handle your personal problems?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

7. In the last month, how often have you felt that things were going your way?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

8. In the last month, how often have you felt found that you could not cope with all the things that you had to do?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

9. In the last month, how often have you been able to control irritations in your life?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

10. In the last month, how often have you felt that you were on top of things?

- 0. never
- 1. almost never
- 2. sometimes

- 3. fairly often
- 4. very often

11. In the last month, how often have you been angered because of things that happened that were outside of your control?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

13. In the last month, how often have you been able to control the way you spend your time?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- 0. never
- 1. almost never
- 2. sometimes
- 3. fairly often
- 4. very often

## Appendix B: Perceived Stress Scale (In Spanish, Adapted for Mexico)

Marca la opción que mejor se adecúe a tu situación actual, teniendo en cuenta el última mes.

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

1. ¿Con qué frecuencia has estado afectado/a por algo que ha ocurrido inesperadamente?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

2. ¿Con qué frecuencia te has sentido incapaz de controlar las cosas importantes de tu vida?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

3. ¿Con qué frecuencia te has sentido nervioso/a o estresado/a (lleno de tensión)?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

4. ¿Con qué frecuencia has manejado con éxito los pequeños problemas irritantes de la vida?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

5. ¿Con qué frecuencia te has sentido que has afrontado efectivamente los cambios importantes que han estado ocurriendo en tu vida?
0. Nunca
  1. Casi nunca
  2. De vez en cuando
  3. A menudo
  4. Muy a menudo
6. ¿Con qué frecuencia has estado seguro/a sobre tu capacidad de manejar tus problemas personales?
0. Nunca
  1. Casi nunca
  2. De vez en cuando
  3. A menudo
  4. Muy a menudo
7. ¿Con qué frecuencia has sentido que las cosas te van bien?
0. Nunca
  1. Casi nunca
  2. De vez en cuando
  3. A menudo
  4. Muy a menudo
8. ¿Con qué frecuencia has sentido que no podías afrontar todas las cosas que tenías que hacer?
0. Nunca
  1. Casi nunca
  2. De vez en cuando
  3. A menudo
  4. Muy a menudo
9. ¿Con qué frecuencia has podido controlar las dificultades de tu vida?
0. Nunca
  1. Casi nunca
  2. De vez en cuando
  3. A menudo
  4. Muy a menudo
10. ¿Con qué frecuencia has sentido que tienes el control de todo?
0. Nunca
  1. Casi nunca
  2. De vez en cuando
  3. A menudo
  4. Muy a menudo

11. ¿Con qué frecuencia has estado enfadado/a porque las cosas que te han ocurrido estaban fuera de tu control?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

12. ¿Con qué frecuencia has pensado sobre las cosas que no has terminado (pendientes de hacer)?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

13. ¿Con qué frecuencia has podido controlar la forma de pasar el tiempo (organizar)?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

14. ¿Con qué frecuencia has sentido que las dificultades se acumulan tanto que no puedes superarlas?

- 0. Nunca
- 1. Casi nunca
- 2. De vez en cuando
- 3. A menudo
- 4. Muy a menudo

## Appendix C: Information from Parent

Your teen's name \_\_\_\_\_

Your teen's age (circle one)      13    14    15    16    17

Your teen's sex (circle one)      Female    Male

Your teen's race/ethnicity (circle one)

Asian / Pacific Islander      Black or African American

Hispanic or Latino      Native American or American Indian

White      Other \_\_\_\_\_

Your name \_\_\_\_\_

What is your relationship to the teen? (Please circle one)

Mother      Father      Other \_\_\_\_\_

What is the highest degree or level of school you have completed? *If currently enrolled, highest degree received.*

Did not finish High School

High School Graduate or GED

More than High School, but less than a 4-year degree

College graduate

MA or equivalent

PhD, MD or other doctoral degree

What is the highest degree or level of school your child's other parent has completed, if known? *If currently enrolled, highest degree received.*

No schooling completed

Nursery school to 8<sup>th</sup> grade

Some high school, no diploma

High school graduate, diploma or the equivalent (for example: GED)

Some college credit, no degree

Trade/technical/vocational training

Associate degree

Bachelor's degree

Master's degree

Professional degree

Doctorate degree

What is his/her relationship to the teen? (Please circle one)

Mother

Father

Other \_\_\_\_\_

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