

ABSTRACT

Acculturative Stress and Obesity: The Moderating Role of Emotional Eating in a Community Sample of Latino/a Adolescents

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Acculturating to American culture is often a stressful experience for Latino/a adolescents and has been associated with negative health outcomes and obesity. Previous research suggests that maladaptive coping increases the association between stressful acculturative experiences and negative health outcomes. Emotional eating has been identified as a maladaptive coping mechanism in Latino/a adolescents and has been shown to contribute to increased weight. However, limited studies have investigated the differences in emotional eating and stress between Latino/a and non-Latino/a adolescents or the role of emotional eating as a coping mechanism for acculturative stress. The current study sought to fill these gaps using a community sample of 168 Latino/a adolescents. A series of Pearson correlations compared differences in emotional eating and stress between Latino/a and non-Latino/a adolescents. Second, a series of hierarchical linear regressions determined if emotional eating strengthened the relationship between baseline acculturative stress and longitudinal change in body mass index.

Participants completed self-report measures of emotional eating, eating habits, perceived stress, and acculturative stress at time one. Height and weight measurements were taken at time one and repeated at a three-month follow-up. There were no differences in emotional eating between Latino/a and non-Latino/a adolescents. In Latino/a adolescents, neither acculturative stress nor emotional eating was associated with longitudinal change in body mass index. Further, emotional eating failed to moderate the relationship between acculturative stress and change in body mass index; additional research is needed to determine if acculturative stress or emotional eating contributes to longitudinal weight gain.

Despite these negative findings, it appears that Latino/a adolescents are at a high risk for negative health outcomes. Compared to non-Latino/a adolescents, Latino/a adolescents demonstrated significantly higher body mass index at time one and time two, gained significantly more weight between time one and time two, demonstrated significantly worse eating patterns, and endorsed significantly higher levels of stress. Additionally, results suggest that acculturative stress is a significant risk factor for higher emotional eating in Latino/a adolescents. Such knowledge should be applied when considering prevention of disordered eating, unhealthy eating patterns, and weight gain in the rapidly growing population of Latino/a adolescents in the United States.

Acculturative Stress and Obesity:
The Moderating Role of Emotional Eating in a Community Sample of Latino/a Adolescents

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CHAPTER ONE

Introduction

Adolescent Obesity

According to the Center for Disease Control and Prevention, adolescent obesity rates have more than tripled since 1960 (Barlow, 2007). An estimated 20.5 percent of American adolescents aged 12 to 19 years are classified as obese (Ogden, Carroll, Kit, & Flegal, 2014). Obesity rates are disproportionately higher among ethnic minority youth in the United States, including Latino adolescents (Neumark-Sztainer, Story, Hannan, & Croll, 2002; Harrington, 2008). Approximately 38 percent of Latino adolescents aged 12 to 19 years are overweight compared to 31 percent of non-Hispanic white adolescents (Ogden et al., 2014). Twenty-three percent of Latino adolescents are classified as obese while 19 percent of non-Hispanic white adolescents are considered obese (Ogden et al., 2014; Stovitz, Schwimmer, Martinez, & Story, 2008).

The United States Census Bureau defines Latino as a person of Cuban, Mexican, Puerto Rican, Dominican, South or Central American, or other Spanish culture of origin regardless of race (Pérez-Escamilla & Putnik, 2007). Such individuals are often referred to as Hispanics, but some controversy surrounds this term. The U.S. Census Bureau coined the term Hispanic in the 1970s to designate people from Spanish-speaking origins (Comas-Díaz, 2001). However, not all Spanish-speakers are from Latin countries and not all Latin countries speak Spanish (e.g. Brazil). The term Latino is used to refer to people originating from or having a heritage related to Latin American countries. The term both

includes Brazilians and excludes European Spaniards from being identified as ethnic minorities in the United States (Comas-Díaz, 2001). Further, the term Latino is often preferred because it originates from home cultures rather than the United States government (Alcoff, 2005; Comas-Díaz, 2001). Finally, many Latino individuals feel that the term Hispanic carries a connotation of poor socioeconomic status and little respect for their home culture (Alcoff, 2005; Oquendo, 1995). Thus, the term Latino is generally accepted as more inclusive and respectful and will be used throughout this project.

In 2014, 55.3 million Latinos resided in the United States, comprising 17.3 percent of the total population (Stepler & Brown, 2016). Latinos are the youngest major ethnic group in the United States (Patten, 2016). Thirty-two percent of Latinos are under the age of 18 years, compared to 19 percent of non-Hispanic whites, 20 percent of Asians, and 26 percent of African-Americans (Patten, 2016). Additionally, the Latino population is the most rapidly increasing ethnic minority group in the United States and is expected to grow by 86 percent between 2015 and 2050 (Krogstad, 2014). It is estimated that Latinos will make up 25 percent of the total population by the year 2050 (Pérez-Escamilla & Putnik, 2007) and that Latino children will make up one-third of all children in the United States by the year 2030 (Lindberg, Stevens, & Halperin, 2013).

Rates of obesity have risen substantially in Latino adolescents over the last 30 years, increasing from approximately 8 to 38 percent of the population (National Hispanic Caucus of State Legislators [NHCSL], 2010). This is alarming given the considerable physical and psychological problems faced by obese youth. Physically, obesity increases the risk of sleep apnea, asthma, cardiovascular diseases, dyslipidemia, hypertension, insulin resistance and type II diabetes, osteoarthritis, gallbladder disease,

and renal, colon, and genitourinary diseases (Papoutsis, Drichoutis, & Nayga, 2013; Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007; Shaibi, Roberts, & Goran, 2008; Han, Lawlor, & Kimm, 2010). Compared to same-aged peers, obese Latino adolescents are at a heightened risk for poor self-esteem, body dissatisfaction, depression, anxiety, bullying, social stigmatization, and self-harm (Cornette, 2008; Lobstein, Baur, Uauy, 2004; Valente, Fujimoto, Chou, & Spruijt-Metz, 2009).

Specifically among Latino youth, obesity-related health complications are a leading cause of death (NHCSL, 2010). Obesity increases the risk for diabetes, hypertension, heart disease, and fatty liver disease in Latino adolescents (NHCSL, 2010). It is estimated that nearly one-half of today's Latino youth will develop diabetes in their lifetime (Heuman, Scholl, & Wilkinson, 2013). Among adolescents diagnosed with diabetes, Latino adolescents are significantly more likely to be diagnosed with Type 2 diabetes (22 percent of cases) than non-Hispanic white youth (6 percent of cases). Obese Latino adolescents display the highest triglyceride levels and highest rates of fatty liver disease amongst all youth (Caprio et al., 2008; Schwimmer, McGreal, Deutsch, Finefold, & Lavine, 2005), as well as the least awareness, treatment, or control of hypertension and cardiovascular diseases (Center for Disease Control and Prevention [CDC], 2006; Giardina et al., 2013). Finally, overweight Latino adolescents demonstrate more depressive symptoms, lower global self-worth, more body dissatisfaction, more weight-related concerns, and lower perceived quality of life than non-Hispanic white youth (Robinson, Chang, Haydel, Killen, 2001; Wallander et al., 2013; Jaser, Holl, Jefferson, & Grey, 2009).

Causes of Obesity Among Latinos

At the most basic level, obesity is caused by an energy imbalance; more calories are consumed than expended, leading to an excess of calories and subsequent fat storage (Papoutsis et al., 2013). Calories are consumed through food and expended through natural bodily functions and physical activity. Although energy imbalance explains excess calories, obesity in Latino populations is a multi-dimensional concept influenced by individual and environmental factors (Papoutsis et al., 2013; Candib, 2007). A person's motivation to eat is influenced not just by physiological needs and nutritive value of food, but also cues from the body, social environment, and physical environment.

Socially, one's cultural view of body image can influence perceptions of obesity. In many Latino families, a larger body size is seen as healthy and more desirable (Tung & McDonough, 2015). Larger body size is associated with health and wealth and older generations who experienced severe food insecurity may prefer larger bodies (Barroso, Peters, Johnson, Kelder, & Jefferson, 2010; Tung & McDonough, 2015). Latino mothers often view heavier children as cuter, more gratifying, less fragile, and safer (Kaufman & Karpati, 2007). Additionally, one study found that Latino participants described larger bodies as more attractive and smaller bodies as masculine and ugly, while 43 percent of normal-weight Latino participants in another study wanted to be larger (Tung & McDonough, 2015). Barroso and colleagues (2010) determined that Latino males view larger-bodied Latino females as less pretentious, better communicators, and having better self-esteem than smaller Latino females (Barroso et al., 2010).

Biologically, a family history of obesity strongly predicts weight gain in Latino adolescents (Fisler & Warden, 2006; Sutton et al., 2005). Approximately 40 to 70 percent

of the variation in obesity in the general population is due to genetic factors (Comuzzie & Allison, 1997). Similarly, genetics account for approximately 65 percent of variation in obesity within a Latino adult population (Duggirala et al., 2001). In Latino children and adolescents, Butte and colleagues (2006) found that heritability coefficients for body weight ranged from 0.24 to 0.75, while heritability coefficients for body composition (percentage of body fat) ranged from 0.18 to 0.35 (Butte, Guowen, Shelley, & Comuzzie, 2006). Major loci for the development and maintenance of obesity in Latinos have been identified in genome wide scans in both Latino adults and youth (Comuzzie et al., 1997; Duggirala et al., 2001; Comuzzie et al., 2012). For example, significant correlations have been detected between genetics and body composition, as well as energy expenditure (Cai, Cole, Butte, Voruganti, & Comuzzie, 2008). Although genetics play an important role in the development and maintenance of obesity, environmental factors account for a portion of the variance (Butte et al., 2006). Specific environmental factors include socioeconomic status, infant feeding practices, dietary intake, and physical activity (Butte et al., 2006; Innella, Breitenstein, Hamilton, Reed, & McNaughton, 2016; Butte, 2009).

Obesogenic behaviors, such as poor nutrient intake, unhealthy eating and sleep patterns, substance use, screen time, attempted weight control, and physical activity, account for approximately 40 percent of variations in health outcomes and thus play a major role in the development and maintenance of obesity (Satcher and Higginbotham 2008; Papoutsis et al., 2013). In Latino populations, contextual factors, specifically low socioeconomic status, influence obesogenic behaviors. Latino families are more likely to live in poverty than non-Hispanic white families (Ogden et al., 2014); 24 percent of Latinos live in poverty compared to only 10 percent of non-Hispanic whites (DeNavas-

Walt & Proctor, 2015). Further, 10 percent of Latinos live in deep poverty (incomes below 50 percent of the federal poverty threshold) versus 7 percent of the general population (DeNavas-Walt & Proctor, 2015).

Most research concludes that Latinos living in the United States consume a less healthful diet compared to other ethnic minority populations (Allen et al., 2007; National Center for Health, 2007; Gordon-Larsen, Harris, Ward, & Popkin, 2003). For example, Latino adolescents consume fewer fruits and vegetables, less milk, and more soda than non-Hispanic white youth (Allen et al., 2007). Poor nutrition in Latino populations is partially due to less access to healthy foods and food insecurity (Ayala, Baquero, & Klinger, 2008). Latino households are twice as likely to experience food insecurity, which is associated with decreased consumption of healthy food, poorer health, and higher body mass index (Nord, 2011; Nackers & Appelhans, 2013; Reyes-Rodríguez et al., 2016; Buscemi, Beech, & Relyea, 2011). Families often find processed foods more affordable and convenient than fresh meats and produce and subsequently spend significantly more money on cheaper, unhealthy foods and foods with empty calories than the general population (Coleman- Jensen, Nord, & Singh, 2012; Reyes-Rodríguez et al., 2016; Schlomann, Hesler, Fister, & Taft, 2012; Agne, Daubert, Munoz, Scarinci, & Cherrington, 2012). Further, healthy foods are often not available in Latino neighborhoods (Lopez-Class & Hosler, 2010); supermarkets have largely migrated to suburban areas, forcing individuals to shop at small grocery and convenience stores that offer fewer healthy choices (Morland, Wing, Diez Roux, & Poole, 2002; Graham, Kaufman, Novoa, & Karpati, 2006). For example, only 28 percent of small convenience stores carry fruits compared to 91 percent of supermarkets (Graham et al., 2006).

Regular physical activity is recommended for weight management and overall health in adolescents (Whitt-Glover, Hogan, Lang, & Heil, 2008). The Center for Disease Control and Prevention recommends that adolescents should participate in sixty minutes of more of physical activity each day (CDC, 2015), but only 10.3 percent of 12 to 15 year old Latino youth and 8.3 percent of 16 to 19 year old Latino youth do so (Belcher et al., 2010; Trojano et al., 2008). Physical activity declines significantly from childhood to adolescence and is consistently lower in Latino girls than boys (Trojano et al., 2008). Latino adolescents are less likely to be involved in organized physical activity outside of school (Singh, Yu, Saihpash, & Kogan, 2008; CDC, 2003) and to receive parental support for engaging in physical activity than non-Hispanic white youth (Elder et al., 2010). Neighborhoods with high Latino populations often have high volumes of traffic, above average levels of crime and violence, and limited green space or parks making physical activity not only difficult, but also unsafe (Roman, Stodolska, Yahner, & Shinew, 2013; Zhu & Lee, 2008; Shinew, Stodolska, Roman, & Yahner, 2013; Babey, Hastert, Yu, & Brown, 2008). Additionally, Latino adolescents spend significantly more time watching television and playing video games than non-Hispanic white adolescents (Allen et al., 2007). In a sample of 11, 265 Latino adolescents, those who exercised more frequently and watched less television were significantly less likely to be overweight than Latino youth with fewer healthful behaviors (Delva, O'Malley, & Johnston, 2007).

Latino Acculturation to American Culture

Approximately 60 percent of Latino children living in the United States are foreign-born and thus experience the process of acculturation (Gordon-Larsen et al., 2003; Stepler & Brown, 2016). Acculturation is defined as the process of change caused

by extended contact with different groups, people, and social influences (Redfield, Linton, & Herskovits, 1936; Berry, Kim, Minde, & Mok, 1987; Caplan, 2007) and is most often studied in immigrant populations permanently settled in a new country (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Five categories of acculturative changes are generally identified in the literature: physical, biological, cultural, social, and psychological (Berry et al., 1987). Physical changes involve moving to a new location and housing, while biological changes occur in response to new nutrition, diseases, and populations. Encountering new political, economic, technical, linguistic, religious, and social institutions causes cultural change and new social relationships are formed with new peers. Finally, psychological changes include alterations in behavior and mental health status (Berry et al., 1987). Specific changes may be seen in language, types of food and music, media use, ethnic pride, social customs, and ethnic social relations (APA Presidential Task Force, 2012).

As conceptualized by Berry (2006), the process of acculturation includes three major tenants (Sam & Berry, 2006). First, there must be contact between two cultural groups or individuals who come together in a continuous and firsthand manner (Sam & Berry, 2006). Contact must be continuous to differentiate acculturation in immigrants from small changes in short-term visitors (Sam & Berry, 2006). Second, acculturation involves reciprocal influence in which changes occur in both cultures. The dominant culture tends to exert more influence than the non-dominant culture such that American culture tends to exert more influence on immigrants than Latino culture (Sam & Berry, 2006). Finally, acculturation inherently involves the dynamic process of change and the stable outcomes of change (Sam & Berry, 2006).

Early theories of acculturation conceptualized the process as linear, unidirectional, and one-dimensional (Caplan, 2007). Acculturation was believed to occur in a predictable manner with individuals moving from less acculturated to fully acculturated over time and acculturation increasing between generations (Cuellar, Harris, & Jasson, 1980; Caplan, 2007; Gordon, 1964). More recently, acculturation has been conceptualized as a bi-directional process in which individuals acquire the practices, values, and identity of the receiving culture while also retaining their native practices, values, and identity (Berry, 1997; Cano et al., 2016). In other words, acquiring a new cultural is independent of maintaining the original culture (Lara, Gamboa, Kahramanian, Morales, & Hayes Bautista, 2005). Further, levels of acculturation may vary within the individual. For example, some family relations, like obligation to family, change as an individual becomes more acculturated (Marin, 1993). Others, such as support received from family, remain important to both lowly and highly acculturated Latinos (Marin, 1993). Similarly, Latino adolescents may predominantly speak Spanish at home while associating with English-speaking peers outside the home (Cano et al., 2015).

Just as acculturation was originally viewed as a linear process, it was assumed that there was little variability in the acculturation process between individuals (Abraído-Lanza, Armbrister, Flórez, & Aguirre, 2006; Sam & Berry, 2010). Within bi-directional acculturation models, change occurs in two independent dimensions, leading to multiple possible outcomes (Berry et al., 1987; Sam & Berry, 2010). Assimilation is the complete acquisition of the new culture and no maintenance of the original culture, while separation is the complete rejection of the new culture. Marginalization is voluntary or involuntary exclusion from both cultures and integration is the adoption and balance of

both cultures (Berry, 1997). Integration appears to be the most adaptive acculturation strategy, as individuals become integrated in the new culture, feel comfortable in both cultures, and retain a dual cultural identity (Lara et al., 2005; Sam & Berry, 2010). Adolescents who integrate have the best psychological and sociocultural outcomes, those who assimilate or separate have moderate outcomes, and marginalized adolescents face the worst outcomes (Berry, Phinney, Sam, & Vedder, 2006).

Acculturation and Health Outcomes in Latinos

Research examining the relationship between acculturation and health outcomes in Latinos is complex (Lara et al., 2005). Acculturation affects some health behaviors positively, with higher levels of acculturation predicting better health outcomes (Lara et al., 2005; Goel et al., 2003; Allen & Cummings, 2016). Some health behaviors are negatively affected, with higher levels of acculturation predicting worse health outcomes (Lara et al., 2005; Abraído-Lanza, Chao, Florez, 2005; Acevedo-Garcia & Bates, 2008; Vega, Rodriguez, & Gruskin, 2009).

Acculturation appears to have a positive effect on health care use, such as regular doctor's appointment and prevention services (Lara et al., 2005; Clark, 2002; Allen & Cummings, 2016; Goel et al., 2003). Latino families with higher levels of acculturation are more likely to regularly utilize medical care, be more familiar with health care services, and feel satisfied by healthcare services (Chesney, Chavira, Hall, & Garry, 1982; Granados, Puvvula, Berman, & Dowling, 2001; Hu & Covell, 1986). The least acculturated Latinos were 14.4 percent less likely to use emergency services for any reason than non-Latino individuals (Allen & Cummings, 2016) and children of the least acculturated mothers attended fewer well-child visits and received fewer immunizations

(Clark, 2002). Additionally, more acculturated Latinos were more likely to seek preventive services (Solis, Marks, Garcia, & Shelton, 1990), including cervical cancer screenings and breast cancer screenings (Elder et al., 1991; Goel et al., 2003; Peragallo, Fox, & Alba, 2000; Harmon, Castro, & Coe, 1996).

Less acculturated Latinos experience more barriers to accessing care; frequently cited barriers include language difficulties, negative experiences with providers, and financial difficulties (Clark, 2002; Rivers & Patino, 2006; Timmins, 2002; Lassetter & Baldwin, 2004; Documet & Sharma, 2004). Additionally, Latinos with lower levels of acculturation are less likely to have healthcare coverage (Documet & Sharma, 2004, Lassetter & Baldwin, 2004, Rivers & Patin, 2006). Granados and colleagues found that 64 percent of children of two immigrant Latino parents were uninsured compared to 23 percent of children of one immigrant Latino parent and 10 percent of two non-immigrant Latino parents (Granados et al., 2001). Similarly, in a sample of 25,388 Latino children, first and second generation children were significantly more likely to be uninsured (58 percent and 19 percent respectively) than third generation children (9.5 percent; DeCamp & Bundy, 2012). Overall it appears that low levels of acculturation are associated with barriers to healthcare access and less healthcare utilization.

Despite the role of acculturation on healthcare access and utilization, multiple studies have found that greater levels of acculturation are associated with negative health outcomes (Lara et al., 2005; Unger et al., 2004; Corral & Landrine, 2008). This phenomenon is referred to as the “immigrant paradox” (Katsiaficas, Suarez-Orozco, Sirin, & Gupta, 2013). Although first-generation immigrants have fewer social and economic resources, they tend to have better mental and physical health (Abraído-Lanza

et al., 2005; Acevedo-Garcia & Bates, 2008; Vega, Rodriguez, & Gruskin, 2009). Later generations see a general decline in health and health behaviors (Katsiaficas et al., 2013). Greater acculturation has been associated with greater rates of alcohol consumption in Latinos (Abraído-Lanza et al., 2005; Otero-Sabagal, Sabogal, Pérez-Stable, & Hiatt, 1995; Randolph, Stroup-Benham, Black, & Markides, 1998). In Latino adolescents, each increase in the level of English proficiency increases the risk of alcohol use by 11 percent (Myers et al., 2009). First-generation Latino adolescents are significantly less likely to consume alcohol or binge-drink than second and third-generation adolescents (Wahl & Eitle, 2010) and were less likely to report alcohol consumption in the previous 30 days (Elder et al., 2002). Additionally, more acculturated Latinos are more likely to smoke cigarettes (Abraído-Lanza et al., 2005; Otero-Sabagal et al., 1995; Hussey et al., 2007; Coonrod, Balcazar, Brady, & Garcia, 1999). Additionally, foreign-born Latino youth demonstrated significantly lower rates of substance use disorders than adolescents born in the United States (Turner & Gil, 2002).

Acculturation has been identified as a risk factor for mental health problems (Ortega, Rosenheck, Alegría, & Desai, 2000). In a sample of 332 Latino youth, those born outside the United States displayed significantly lower levels of internalizing symptoms than youth born in the United States (Sirin, Ryce, Gupta, & Rogers-Sirin, 2013). More acculturated adolescents display higher levels of depression and depressive symptoms than their less acculturated peers (Hovey & King, 1996; Hovey, 2000; Miranda & Cooper, 2004). Further, Torres found that level of acculturation reliably predicted severity of depressive symptoms (Torres, 2010). Orientation to Latino culture predicted lower depressive symptoms while American orientation predicted more severe

pathology (Torres, 2010). Further, level of acculturation increases the risk of suicidal ideation in Latino adolescents (Hovey, 2000; Polanco-Roman & Miranda, 2013; Haboush-Deloye, Oliver, Parker, & Billings, 2015; Gomez, Miranda, & Polanco, 2011).

Acculturation and Obesity

Amongst Latino adults, a positive correlation exists between obesity and acculturation with more acculturated Latinos being 1.5 times more likely to be obese (Creighton, Goldman, Pebley, & Chung, 2012; Abraído-Lanza, et al., 2005). Latino individuals who were born in the United States, who have lived longer in the United States, and who immigrated at a young age had the highest prevalence of obesity (Singh & Siahpush, 2002; Kaushal, 2009; Park, Neckerman, Quinn, Weis, & Rundle, 2008; Isasi et al., 2015; Himmelgreen et al., 2004; Goel, McCarthy, Phillips, & Wee, 2004; Roshania, Narayan, & Oza-Frank, 2008; Oza-Frank & Cunningham, 2010). Further, acculturation status was significantly associated with waist circumference and abdominal obesity in a sample of 2791 Latino adults (Sundquist & Winkleby, 2000).

The relationship between acculturation and obesity has been mixed in Latino adolescents. Popkin and Udry (1998) surveyed 2277 Latino adolescents as part of a national study (Popkin & Urdy, 1998). Latino youth born in the United States to immigrant parent displayed significantly higher rates of obesity than first-generation adolescents (Popkin & Urdy, 1998). Another national study of 1349 Latino adolescents found that obesity rates were highest in youth with parents born in the United States and lowest in foreign-born youth (Mendoza & Dixon, 1999). Similarly, Taverno, Rollins, and Francis (2010) found that third-generation Latino youth were two times as likely to be obese than first and second-generation adolescents (Taverno, Rollins, & Francis, 2010).

Ahn and colleagues (2008) reported that Latino boys who were born in the United States or had lived in the United States for ten or more years were significantly more likely to be overweight or obese than immigrant youth (Ahn, Juon, & Gittelsohn, 2008). Further, Gordon-Larsen and colleagues studied over 8000 Latino adolescents (Gordon-Larsen et al., 2003). After controlling for acculturation, there were no significant differences in weight between youth born in and out of the United States (Gordon-Larsen et al., 2003).

In contrast, Singh and colleagues (2009) utilized data from the National Survey of Children's Health and concluded that obesity and overweight prevalence did not vary by generational status in Latino adolescents (Singh, Kogan, & Yu, 2009). Similarly, Liu and colleagues failed to show that generational status was a correlate of obesity in Latino adolescents (Liu, Probst, Harun, Bennett, & Torres, 2009). Several other studies found that Latino children and adolescents born outside the United States weighed more than youth born in the United States (Van Hook & Baker, 2010; Baker, Balistreri, & Van Hook, 2009; Balistreri & Van Hook, 2009). However, these studies measured younger children, suggesting that differences in weight may develop in later in Latino populations (Nyugen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008). For example, a study found that Latino adolescents in high school were significantly more likely to be overweight than Latino adolescents in middle school (Ahn et al., 2008).

Acculturation has been shown to have negative effects on nutrition in Latino youth such that obesity-related behaviors may be present and contributing to weight gain over time (Gordon-Larsen et al., 2003; Nyugen-Rodriguez et al., 2008; Reyes-Rodríguez et al., 2016; Oza-Frank & Cunningham, 2010). In Latino adult populations, more acculturated individuals tend to consume more fatty foods, more fast food, more sugar-

sweetened beverages, and fewer fruits and vegetables (Ayala et al., 2008; Pérez-Escamilla & Putnik, 2007; Dixon, Sundquist, & Winkleby, 2000; Batis, Hernandez-Barrera, Barquera, Rivera, & Popkin, 2011; Neuhauser, Thompson, Coronado, & Solomon, 2004). First-generation Latino adults have been shown to have a higher average intake of protein, vitamins A and C, folic acid, and calcium than later generations of Latinos (Guendelman & Abrams, 1995). Elderly Latino populations demonstrate increasingly poor diets with increasing time in the United States, specifically consuming more saturated fat, more simple sugars, and more simple carbohydrates (Bermudez, Falcon, & Tucker, 2000)

Higher levels of acculturation also appear to negatively affect eating patterns of Latino÷ adolescents (Allen et al., 2007; Barquera et al., 2008; Unger et al., 2004, Gordon-Larsen et al., 2003). For example, the National Health and Nutrition Examination Survey (NHANES) found that Latino children born in the United States consumed more total calories and more fat than their foreign-born counterparts (National Center for Health, 2007). A study compared food consumption across generations and found that third-generation Latino adolescents consumed fewer fruits and vegetables, less milk, and more soda than first and second-generation youth (Allen et al., 2007). Gordon-Larsen and colleagues (2003) investigated dietary patterns in 8613 Latino adolescents (Gordon-Larsen et al., 2003). Results indicated that Latino youth born in the United States consumed fewer fruits and vegetables and more cheese and fast foods than foreign-born adolescents. Additionally, less acculturated adolescents were more likely to eat breakfast and lunch on a daily basis (Gordon-Larsen et al., 2003). In another study, 1385 Latino sixth-graders reported on acculturation and fast food consumption; students who reported

higher levels of acculturation in sixth grade consumed significantly more fast food in seventh grade than less acculturated youth (Unger et al., 2004). Further, less acculturated adolescents endorsed a stronger intent to eat healthfully and more willingness to give up unhealthy food items (Diaz, Marshak, Montgomery, Rea, & Backman, 2009).

The typical Latino meal varies regionally, but typically is high in fiber and low in fat, includes vegetables and beans, and is paired with corn tortillas and hot Chile sauces (Kulkarni, 2004; Azar et al., 2013). Festival foods, or foods prepared and eaten for special events or holidays, are typically rich in carbohydrates (i.e., tortillas, rice) and protein (i.e., meat, beans, cheese) and are often fried using oils and shortenings (Barroso et al., 2010; Benavides-Vaello, 2005). Research suggests that Latino immigrants increase their consumption of festival foods and decrease their consumption of traditional foods upon settling in the United States (Azar et al., 2013). For example, meat is traditionally reserved for holidays and special occasions in Latino countries due to its high cost, but Latinos in the United States frequently purchase and consume more meat than the general population (Azar et al., 2013). The social aspects of preparing and consuming festival foods are a powerful link to an individual's ethnic identity and home culture, thus Latinos may increase consumption to maintain ethnic ties (Benavides-Vaello, 2005).

In regards to disordered eating, Latino adolescents who are more acculturated are more likely to develop eating disorder symptoms and have poor body image (Lopez, Blix, & Blix, 1995; Chamorro & Flores-Ortiz, 2000; Kroon Van Diest, Tartakovsky, Stachon, & Perez 2014). In a study of Latino high school girls, acculturation was a significant risk factor for binge- eating episodes, purging, and preoccupation with weight (Gowen, Hayward, Killen, Robinson, & Taylor, 1999). In another study, Latino

immigrants to the United States demonstrated significantly lower levels of binge eating than Latinos born in the United States (Alegria et al., 2007). Specifically, orientation to American culture strongly predicted eating disorders in Latino females; for every one-point increase in American orientation, the risk of developing an eating disorder doubled (Cachelin, Phinney, Schug, & Striegel-Moore, 2006). Acculturated female Latino college students demonstrated more eating problems and were less likely to seek treatment when diagnosed with an eating disorder (Cachelin, Veisel, Barzegarnazari, & Streigel-Moore, 2000). Similarly, acculturation was positively correlated with more abnormal eating attitudes in female Latino adolescents (Pumariiega, 1986; Jane, Hunger, & Lozzi, 1999).

Chamorro and Flores-Ortiz (2000) recruited 139 Latino adults and measured acculturation level and eating attitudes (Chamorro & Flores-Ortiz, 2000). Second generation Latinos were both the most acculturated and endorsed the highest disordered eating patterns, specifically more pressure from others to lose weight (Chamorro & Flores-Ortiz, 2000). Similarly, one study found that identification with Latino culture was a protective factor against internalization of the thin ideal and body dissatisfaction (Warren, Gleaves, Cepeda-Benito, Fernandez, & Rodrigues-Ruiz, 2005). It appears that Latino women who were more acculturated internalized the thin ideal, putting them at a higher risk for disordered eating (Chamorro & Flores-Ortiz, 2000; Ayala, Mickens, Galindo, & Elder, 2007; Pepper & Ruiz, 2007).

Berry's Acculturation Model

Berry and colleagues (1987) proposed an acculturation model to help explain how individuals manage the process of acculturation and to elucidate factors that lead to negative health outcomes (Figure 1; Berry, 1987). The approach assumes that adolescents

face the challenge of experiencing and interacting with two cultures at once during the process of acculturation. Due to a variety of personal factors, not all adolescents will view their experience as difficult or stressful (Sam & Berry, 2006). For some, adjustments to the dominant culture are simple and acculturation enhances opportunities, social relationships, mental health, and physical health (Berry et al., 1987; Sam & Berry, 2006). When acculturative experiences are perceived as more difficult or distressing, the adolescent experiences acculturative stress (Sam & Berry, 2006).

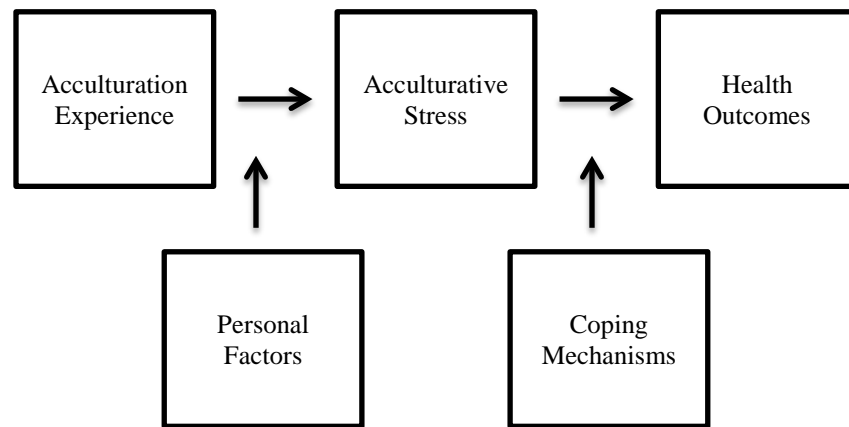


Figure 1: Berry's Acculturation Model

As outlined by Berry's acculturation model, acculturative stress is a specific type of stress that originates from the process of acculturation (Berry et al., 1987). Caplan (2007) identified three dimensions of acculturative stress in Latino populations: instrumental/environmental, social/interpersonal, and societal. Instrumental and environmental acculturative stress arises from financial concerns, language barriers, lack of access to health care, unsafe neighborhoods, unemployment, and lack of education (Caplan, 2007). Social and interpersonal acculturative stress involves loss of social

networks, loss of social status, family conflict, intergenerational conflict, and changing gender roles (Caplan, 2007). Finally, societal acculturative stress is due to discrimination and stigma, legal status, and political forces (Caplan, 2007).

Latino adolescents not only report similar acculturative stressors as Latino adults, but also endorse additional stressors (Rodriguez, Flores, Flores, Myers, & Vriesema, 2015; Cervantes, Cardosa, & Goldbach, 2015). For example, Latino adolescents reported feeling stressed by conflicting cultural practice, language problems, and ethnic self-consciousness while adults did not (Rodriguez et al., 2015). In a sample of first, second, and third generation Latino adolescents, all generations reported significant stress related to discrimination, family legal problems, family financial problems, and parent overprotectiveness (Cervantes, Padilla, Napper, & Goldbach, 2013). Discrimination has consistently been associated with higher acculturative stress in Latino adolescents (Córdova & Cervantes, 2010; Dawson & Panchanadeswaran, 2010; Reyes, Gillock, Kobus, & Sanchez, 2000).

Adolescents appear to experience the most frequent and severe discrimination at school and from teachers (Córdova & Cervantes, 2010). For example, 170 Latino youth participated in focus groups and reported feeling stressed by being perceived as inferior, being isolated or segregated at school due to language, and being mistrusted by school officials (Córdova & Cervantes, 2010). Additionally, Latino adolescents often serve as translators and guides for parents and family members less fluent in the new language and culture (Suárez-Orozco & Suárez-Orozco, 2002). Both immigrant and native-born Latino adolescents report experiencing acculturative stress due to their mediator role between less acculturated family members and society (Cervantes et al., 2015).

Coping Mechanisms

According to Berry's acculturation model, experiencing acculturative stress is not synonymous with negative health outcomes (Figure 1; Sam & Berry, 2006; Pearlin, 1989). Rather, factors such as coping, moderate the relationship between exposure to a stressor and negative stress responses (Figure 1; Pearlin, 1989). Coping in adolescents involves the conscious effort to regulate emotion, cognitive, behavior, physiology, and the environment with the goal of reducing negative feelings resulting from stressful situations (Compas et al., 2001). In Berry's acculturation model, adaptive coping skills weaken the relationship between acculturative stress and negative health outcomes, while maladaptive coping skills strengthen the relationship (Sam & Berry, 2006). Theoretically, adaptive coping in Latino populations may buffer an individual's experience of acculturative stress and reduce negative health outcomes, such as poor nutrition and obesity (Sam & Berry, 2006; Pearlin, 1989).

Psychosomatic Theory of Eating: Emotional Eating as a Coping Skill

Emotional eating, or eating in response to negative affect such as depression, fear, anxiety, or stress, has been conceptualized as a maladaptive coping mechanism such that food is used as an emotional defense during times of distress (Faith, Allison, & Geliebeter, 1997). The psychosomatic theory of eating hypothesizes that overeating physiologically reduces negative emotions and decreases the stress response (Kaplan & Kaplan, 1957). Normally, stress is associated with proportional decreases in food consumption, but the sometimes people increase their food consumption during times of stress (Adam & Epel, 2007; van Strien, Roelofs, & Weerth, 2013). Stressful situations trigger the HPA axis and the release of corticotropin-releasing factor and

adrenocorticotropin. Subsequently, endogenous glucocorticoids are released to inhibit HPA activity and decrease the stress reaction (Adam & Epel, 2007). As stress levels decrease, glucocorticoids increase desire for fats and sugars in rats by increasing dopamine secretion and amplifying food-related rewards (Adam & Epel, 2007). Rats fed normal chow did not see an increase in dopamine secretion, suggesting that comfort foods better reduced stressful experiences and increased rewarding outcomes (Dallman et al., 2005).

Emotional eaters appear to cope with stress by consuming comfort food, while non-emotional eaters do not display such behavior (Adam & Epel, 2007). For example, Van Strien and colleagues (2012) found that high emotional eaters increased their food consumption following a social stress task, while low emotional eaters did not (Van Strien, Herman, Anschutz, Engels, & de Weerth, 2012). In another study, high emotional eaters consumed significantly more food after a stress-inducing task, while stress did not affect the eating patterns of low emotional eaters (Wallis & Hetherington, 2004). Neither high nor low emotional eaters ate more following an attention-based task (Wallis & Hetherington, 2004). O'Connor and colleagues (2008) examined the moderating effects of emotional eating between daily hassles and increased snacking in a sample of 422 adults (O'Connor et al., 2008). Participants who reported high emotional eating demonstrated stronger positive correlations between daily hassles and snacking than those reporting low emotional eating. In other words, only high emotional eaters reported snacking in response to daily hassles (O'Connor et al., 2008).

Oliver, Wardle, and Gibson (2000) conducted a study to examine the relationship between stress and food choice (Oliver, Wardle, & Gibson, 2000). After exposure to a

laboratory stress test, participants who reported high emotional eating consumed twice as much sweet and fatty food than low emotional eaters, while the amount of food consumed did not differ between high and low emotional eaters in a control group (Oliver et al., 2000). In a sample of 104 African-American female college students, emotional eating moderated the relationship between perceived stress and body mass index, as well as the relationship between racial and gender stress and body mass index (Diggins, Woods-Giscombe, & Waters, 2015). Further, emotional eating has been shown to serve as a coping mechanism following natural disasters (Kuijer & Boyce, 2012). Specifically, women with high emotional eating reported an increase in overeating in response to stress caused by an earthquake (Kuijer & Boyce, 2012). High emotional eaters who did not feel stressed by the earthquake and all low emotional eaters demonstrated no changes in eating patterns, suggesting that emotional eating was used as a way to cope with stress (Kuijer & Boyce, 2012).

Emotional eating serves as a coping mechanism in response to sadness (van Strien et al., 2012; van Strein et al., 2013; Konttinen et al., 2010). For example, Stice and colleagues found that depressive symptoms, but not anxiety or anger, predicted eating in a sample of adolescent girls (Stice, Presnell, & Spangler, 2002). Further, emotional eating moderated the relationship between depressive symptoms and consumption of sweet foods (Konttinen et al., 2010). Depressive symptoms were associated with increased consumption of sweet foods in emotional eaters, whereas depressive symptoms did not affect food intake in non-emotional eaters (Konttinen et al., 2010). Van Strien and colleagues (2012) allowed 124 undergraduate students to snack while viewing either a sad or a neutral movie clip (Van Strien et al., 2012). Participants who reported frequent

emotional eaters consumed significantly more snacks while viewing the sad movie than the neutral movie, while low emotional eaters ate similar amounts of food in both conditions. Specifically, emotional eating explained over half the variance between the movie condition and food consumption (van Strien et al., 2012). In another study, 60 students enrolled in two universities in Spain viewed both a joy-inducing and sadness-inducing scene (van Strien et al., 2013). High emotional eaters consumed significantly more sweet food following the sadness-inducing scene than the joy-inducing scene. Again, low emotional eaters did not change their food intake in response to sadness (van Strien et al., 2013).

Given that emotional eating increases total food intake and promotes consumption of energy-dense comfort foods, it has been identified as a significant risk factor in weight gain and the development of obesity. In a predominantly female and non-Hispanic white sample, emotional eaters were 13.38 times more likely to be overweight or obese (Ozier et al., 2008). Further, eating in response to anxiety and eating in response to depression accounted for a significant proportion of the variance between body mass index and emotional eating, as measured by the Emotional Eating Scale (Tanofsky-Kraff et al., 2007; Perpiñá, Cebolla, Botella, Lurbe, & Torró, 2011; Arnow, Kenardy, & Agras, 1995). In the adult version of the scale, anxiety accounted for approximately 13 percent of the variance between emotional eating and weight and depression account for 10 percent of the variance (Arnow et al., 1995). In adolescent populations, a combination of anxiety, anger, and frustration accounted for between 26 and 30 percent of the variance (Tanofsky-Kraff et al., 2007; Perpiñá et al., 2011). Depression accounted for between 7 and 23 percent of the variance (Tanofsky et al., 2007; Perpiñá et al., 2011).

Emotional Eating in Adolescents

Adolescents often use eating as way to cope with stress and negative affect (APA, 2012). One study concluded that 25 percent of sampled adolescents used food to forget their problems (Martyn-Nemeth, Penckofer, Gulanick, Velsor-Friedrich, & Bryant, 2009), while Farrow and colleagues (2015) estimated that 63 percent of children aged 5 to 13 years ate in response to negative mood (Farrow, Haycraft, & Blissett, 2015). In a sample of 1026 fourth, fifth, and sixth graders, participants reported using unhealthy foods to cope with stress on a regular basis (Jenkins, Rew, & Sternglanz, 2005). Further, participants with higher perceived stress were more likely to use unhealthy food as a coping mechanism than those with low perceived stress (Jenkins et al., 2005). Vannucci and colleagues (2012) concluded that emotional eating moderated the relationship between pre-meal negative affective and food consumption such that high emotional eaters consumed significantly more food when experiencing negative affect than low emotional eaters (Vannucci et al., 2012). Additionally, in a sample of 302 female adolescents, high emotional eaters displayed significantly more binge eating symptoms in response to daily frustrations than low emotional eaters (Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013). Results suggest that female adolescents who use eating as a coping mechanism are at an increased risk for overeating and binge eating (Verstuyf et al., 2013).

Emotional Eating in Latino Adolescents

Emotional eating has been well documented in Latino adolescents. Nguyen-Michael and colleagues (2007) concluded that approximately 22 percent of Latino high school students frequently engaged in emotional eating (Nguyen-Michael, Unger, &

Spruijt-Metz, 2007). In a sample of 517 Latino high school students, 26 percent of normal weight and 18 percent of overweight students reported eating in response to stress, suggesting that emotional eating is common across weight categories (Nguyen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008). Rollins and colleagues (2011) measured emotional eating in Latino fourth graders and found that nearly 50 percent of the sample reported eating in response to three or more emotional situations and 25 percent ate in response to 6 or more emotional situations. Over 30 percent of adolescents reported eating in response to stress and anxiety, while 20 percent reported eating when feeling sad (Rollins et al., 2011). Additionally, overweight and obese Latino adolescents reported experiencing more family and peer weight-related teasing than their normal-weight peers, which in turn contributed to higher rates of emotional eating (Olvera, Dempsey, Gonzalez, & Abrahamson, 2013).

Fewer studies have examined emotional eating as a coping mechanism in Latino adolescents. Jenkins and colleagues (2005) found that Latino children were significantly more likely to use food as a coping mechanism than non-Hispanic white youth (Jenkins et al., 2005). Specifically, participants were asked to rate how often they eat or drink when feeling stressed, nervous, or worried, as well as how much eating or drinking helped improve stress, nervousness, or worry. Latino youth reported eating unhealthy foods in response to negative affect more often and feeling more soothed by food than non-Hispanic white youth (Jenkins et al., 2005).

Belcher and colleagues (2011) examined the moderating effects of emotional eating between worries and body mass index in a sample of 404 female Latino middle school students (Belcher et al., 2011). Previous studies utilized a cross-sectional design

when measuring the relationship between emotional eating and weight (e.g., Nguyen-Rodriguez et al., 2008; Vannucci et al., 2012) and failed to identify a relationship between more frequent emotional eating and weight status. Therefore, Belcher and colleagues (2012) gathered data at two time points six months apart in order to examine the longitudinal effects of emotional eating on weight. Baseline emotional eating moderated the relationship between baseline worries and follow-up body mass index ($\beta = 2.13, p = .003$). The sample was then divided into high and low emotional eating based on the mean emotional eating score. There was a significant, positive relationship between worries and weight in high emotional eating ($\beta = 2.77, p = .009$), but not in low emotional eaters ($\beta = .01, p = .986$; Belcher et al., 2011).

Purpose of the Present Study

Berry's acculturation model states that coping mechanisms moderate the relationship between acculturative stress and negative health outcomes (Berry, 1987). Maladaptive coping mechanisms may worsen the negative effects of acculturative stress on health outcomes, while more healthy ways of coping may serve as a buffer (Berry, 1987). The extant literature suggests that Latino adolescents use emotional eating as a coping mechanism in response to stress and worry (Jenkins et al., 2005; Belcher et al., 2011). Consistent with Berry's model, emotional eating moderated the relationship between worries and body mass index in Latino adolescents (Belcher et al., 2011).

There is currently an absence of research examining whether emotional eating as a coping mechanism moderates the relationship between acculturative stress and BMI in Latino adolescents. The purpose of the present study was to test part of Berry's model of acculturation to examine if emotional eating strengthens the relationship between

baseline acculturative stress and longitudinal change in body mass index in a community sample of Latino adolescents. A secondary purpose of this study was to examine the associations between baseline acculturative stress scores and emotional eating scores, baseline acculturative stress scores and longitudinal change in body mass index, and baseline emotional eating scores and longitudinal change in body mass index. Differences between Latino/a and non-Latino/a adolescents were also considered. Based on the extant literature, the following hypotheses were examined:

1. Baseline acculturative stress scores would be associated with the baseline Total emotional eating score, Anxiety/Anger/Frustration emotional eating score, and Depression emotional eating score (Belcher et al, 2011; Michels et al., 2012; Hou et al., 2013).
2. The baseline Total emotional eating score, Anxiety/Anger/Frustration emotional eating score, and Depression emotional eating score would be associated with change in body mass index between time one and time two (Belcher et al., 2011; Ozier et al., 2008; Lavery & Lowewy, 1993; Van Strien et al., 1986).
3. Baseline acculturative stress will be associated with change in body mass index between time one and time two (Belcher et al, 2011; Michels et al., 2012; Hou et al., 2013).
4. The Total score on the Emotional Eating Scale for Children and Adolescents would moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two (Belcher et al., 2011; Vannucci et al., 2012; Verstuyf et al., 2013).

5. The Anxiety/Anger/Frustration subscale of the Emotional Eating Scale for Children and Adolescents would moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two (Tanofsky-Kraff et al., 2007; Bektas et al., 2016; Perpiñá et al., 2011; Goossen et al., 2009).
6. The Depression subscale of the Emotional Eating Scale for Children and Adolescents would moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two (Goossens et al., 2009; Shomaker et al., 2010; Stice et al., 2002).
7. The Unsettled subscale of the Emotional Eating Scale for Children and Adolescents would moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two. However, it was expected that Unsettled emotional eating would have a smaller effect than the total, Anxiety/Anger/Frustrated, and Depressed emotional eating scores given its lower explanatory power and internal consistency (Tanofsky-Kraff et al., 2007; Bektas et al., 2016; Perpiñá et al., 2011; Goossen et al., 2009; Stice et al., 2002).

CHAPTER TWO

Methods

Participants

The sample consisted of 168 Latino/a middle school adolescents ($N=152$, 90.5%) and high school adolescents ($N=16$, 9.5%) enrolled in health and/or physical activity classes in central Texas. Ages in the sample ranged from 12 to 17 years with a mean age of 13.7 years, ($SD=.88$). Thirteen participants did not complete height and weight measurements at the three-month follow-up, thus time two measurements consisted of 155 Latino/a adolescents. There were no significant differences between the time one and the time two samples on demographic variables, stress, emotional eating, and body mass index.

The Latino/a sample was drawn for a larger sample of 446 adolescents. Of the remaining 278 participants, 176 identified as White, 65 identified as African-American, 16 identified as Asian, and 21 identified as other or an ethnic group not listed. Adolescents who identified as White, African-American, Asian, or Other were grouped together for comparison purposes; the grouping will be referred to as non-Latino/a adolescents. 19 non-Latino/a adolescents did not complete height and weight measurements at the three-month follow-up.

The sample size was based on effect sizes in previous moderation studies and a power analysis (Faul, Erdfelder, Buchner, & Lang, 2009). Van Strien and colleagues (2013) found that emotional eating had a moderating effect of .06 in magnitude between

mood and food intake (Van Strien et al., 2013). Additionally, Kuijer and Boyce (2012) found that emotional eating had a moderating effect of .03 in magnitude between hyperarousal and healthy eating (Kuijer & Boyce, 2012). A power analysis indicated that a sample of at least 135 Latino/a adolescents was needed to achieve statistical power of .80 when attempting to detect a moderating effect of .06 ($p = .05$); the current sample exceeds the minimum sample size needed to achieve statistical power of .80.

Measures

Emotional Eating Scale for Children and Adolescents (Tanofsky-Kraff et al., 2007)

The EES-C is a 25-item self-report measure used to assess the urge to cope with negative affect by eating in children and adolescents. The EES was originally developed for use in adults, but has been adapted for use in youth ages 8 to 17 years. Participants are asked to rate the extent to which they feel the urge to eat in response to emotions. Responses are scored on a five point Likert scale from 1 (No desire to eat) to 5 (Very strong desire to eat). Items are summed together to produce the Total score ranging from 25 to 125. Higher scores reflect a stronger desire to eat in response to negative mood.

In addition to the Total score, the EES-C produces three subscales: Anxiety/Anger/Frustration, Depressed, and Unsettled. Each scale on the EES-C (i.e., Anxiety/Anger/Frustration; Depressed; Unsettled; Total) has demonstrated strong internal consistency in previous studies (α s = 0.95, 0.92, 0.83 and 0.94, respectively). Each subscale is strongly correlated with measures of binge eating and thus demonstrates good construct validity (Anxiety/Anger/Frustration, $r = .65$; Depression, $r = .50$; Unsettled, $r = .46$). Further, the EES-C has been validated in a Spanish-speaking sample of children and

adolescents and continues to show internal consistency, stability, and validity (Perpiñá, Cebolla, Botella, Lurbe, & Torró, 2011). The EES-C was presented to participants in both English and Spanish.

Perceived Stress Scale (Cohen, Kamarack, & Mermelstein, 1983).

The Perceived Stress Scale (PSS-10) was used to assess perceived stress. The PSS-10 is a 10-item self-report questionnaire that assesses feelings of being overwhelmed, being unable to control events, or being unable to predict events in one's life. Respondents rate their feelings and thoughts during the last month. Responses are scored on a five-point Likert scale from 0 (never) to 4 (very often). Positively stated items (items 4, 5, 7, and 8) are reversed scored (e.g., 0=4, 1=3, 2=2, 3=1, 4=0). Items are summed together to yield a total perceived stress score. Total scores range from 0 to 40, with higher scores indicating higher perceived stress.

The PSS-10 was originally developed for use with community samples with at least a junior high school education (Cohen et al., 1983). The measure has been validated in adolescent samples and demonstrated coefficient alpha ranging from 0.87 to 0.89 (Mahon, Yarcheski, Yarcheski, & Hanks, 2007; Martin, Kazarian, & Breiter, 1995; Nguyen-Rodriguez et al., 2008; Yarscheski, Mahon, & Yarcheski, 2011). Further, the PSS-10 has been validated in both English and Spanish and was presented to participants in both languages (Ramírez & Hernández, 2007; Remor, 2006; Reis, Hino, & Añez, 2010; González-Ramírez, Rodríguez-Ayán, & Hernández, 2013).

The Adolescent Food Habits Checklist (Johnson, Wardle, & Griffith, 2002)

The AFHC is a 23-item self-report measure used to assess the quality of adolescent's diets. Items pertain to intake of fruit, vegetable, and energy-dense food and to general aims to eat a diet that is low in fat, low in sugar, high in fruit and vegetables, and healthy. Participants responded using a true/false format; ten items also had a "not applicable" option. The total score represents the total number of healthy responses such that higher scores represent better diet quality. Total scores range from 0 to 23.

The AFHC was originally developed in a sample of 1822 English adolescents aged 13 to 16 years. The scale demonstrated high internal validity, $\alpha = 0.82$, and high test-retest reliability, $r = 0.90$, $p = .001$. The AFHC demonstrated adequate convergent validity; scores were significantly associated with fruit and vegetable intake, $r = .45$, $p < .001$, dietary fat intake, $r = -.46$, $p < .001$, dietary fiber intake, $r = .16$, $p < .001$, dietary restraint, $r = .43$, $p < .001$, and nutrition knowledge, $r = .17$, $p < .001$. A cross-cultural adaptation from English to Spanish was translated and validated in a sample of 200 Venezuelan adolescents aged 15 to 19 years. The Spanish version of the AFHC demonstrated high internal validity, $\alpha = 0.86$, and similar content and construct validity to the as the English version (Morales, Montilva, Gómez, & Cordero, 2012).

Social, Attitudinal, Familial, and Environmental Acculturative Stress Scale for Children (Chavez, Moran, Reid, & López, 1997)

The SAFE-C is a 36-item self-report measure used to assess acculturative stress related to social contexts, attitudes, family relationship, and environmental factors. The SAFE was originally developed for use in adults and was later adapted for use in children over the age of 8 years. Participants are asked to select how much they are bothered by

common stressful situations. Items are scored on a 6-point Likert scale. Each point from 1 to 5 represents one of the following in ascending order: doesn't bother me, almost never bothers me, sometimes bothers me, often bothers me, bothers me a lot; a "0" represents a statement that does not apply to the subject. Total scores range from 0 to 180, with higher scores reflecting higher levels of stress.

In addition to the total score, the SAFE-C produces two major domains: general stress and acculturative stress. The general stress domain is comprised of 16 items that describe general social stressors that may apply to all adolescents regardless of level of acculturation or ethnicity. The acculturative stress domain is comprised of 20 items that describe stressors unique to ethnic minorities as a result of acculturation. The acculturative stress domain can be further divided into two subscales: process stress and discrimination stress. Fourteen items are stressors related to the process of acculturation and 6 items are stressors related the perception of discrimination. The SAFE-C has demonstrated high internal consistency ($\alpha = 0.86$) and all subscales are significantly correlated with one another. Further, the SAFE-C has demonstrated adequate predictive validity as demonstrated by Latino/a adolescents scoring significantly higher than non-Latino/a adolescents, $F(3, 67) = 7.55, p = .000$. Subdomains also demonstrated predictive validity with Latino/a adolescents scoring higher on the acculturative stress, $F(1, 69) = 22.00, p = .001$, discrimination stress, $F(1, 69) = 13.22, p = .001$, and general stress, $F(1, 69) = 10.29, p = .01$, subscales. The SAFE-C was normed on Latino/a adolescents, but was only presented in English. López (2010) translated and validated a Spanish version of the SAFE-C. The English back-translation was determined to be an equivalent

version of the original instrument with a coefficient alpha of .83 (López, 2010). The measure was presented to participants in both English and Spanish.

Body Mass Index (BMI)

The principal investigator or one of three trained research assistants measured the height and weight of each participant after the completion of self-report measures and again three months later. Participants were asked to remove shoes, hats, and heavy clothing (e.g., jackets) prior to being measured. Weight was measured using a Tanita scale (model BF680W) and height was taken with a measuring tape mounted to the wall. Body mass index was calculated by entering the participant's height, weight, age, and sex into the CDC pediatric growth charts for children between the ages of 2 and 20 years. After BMI was computed, the BMI percentile and z-score (standard deviation) were calculated. The BMI percentile and z-score indicated the student's BMI placement compared to same age and sex peers. Four weight categories exist: underweight (less than 5%), healthy weight (5% to less than 85%), overweight (85% to less than 95%), and obese (equal to or greater than 95%). In order to measure weight change between time one and time two, change in BMIz scores were calculated by subtracting the BMIz score at time one from the BMIz score at time two for each participant (Lumeng et al., 2010).

Demographic Information

Participants completed a demographic questionnaire to gather the following information: age, sex, race/ethnicity, immigration generation, socioeconomic status, and physical activity. Two proxy measures were used to measure socioeconomic status; participants indicated if they receive free or reduced lunch and selected their parents'

highest level of education. Immigration generation was determined via three questions; participants were classified as first generation immigrants if they were born outside the United States, second generation immigrants if one or both of their parents was born outside the United States, and third generation immigrants if any of their grandparents were born outside the United States. Finally, participants selected how many minutes of physical activity they engage in per day (i.e., 0-15 minutes, 16-30 minutes, 31-45 minutes, 46-60 minutes, over 60 minutes). Physical activity was defined as “Any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, playing with friends, or walking to school. Some examples of physical activity are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football, and surfing.”

Procedure

Participants were recruited from two middle schools and one high school located in central Texas. The principal investigator visited health and/or physical activity classes to present information about the study and to explain confidentiality. Interested participants were given an informational packet containing additional information about the study, parental consent forms, and participant assent forms. Participants were considered eligible if they returned signed parental consent and participant assent forms and were able to complete questionnaires in English or Spanish. Students enrolled in special education classes or services (e.g., neurological disorder or injury, developmental disability, or intellectual disability) were excluded from the study. All written material was presented in English and Spanish and was presented and distributed in the same order for each participant. Less than one percent of the sample completed measures in

Spanish, while approximately five percent of parents completed consent forms in Spanish.

Approximately two weeks after the initial visit, the principal investigator returned to complete time one measurements. Eligible participants completed written questionnaires during their normal class period; questionnaires included demographic information, the Emotional Eating Scale for Children and Adolescents, the Perceived Stress Scale, the Adolescent Food Habits Checklist, and the Social, Attitudinal, Familial, and Environmental Acculturative Stress Scale for Children (SAFE). Participants had their height and weight measured after completing the questionnaires by either the principal investigator or a trained research assistant. Participants were taken out of the classroom to a partially concealed area in the hallway to complete measurements; measurements took place during normal class periods to ensure maximum privacy in the hallways.

Follow-up measurements were conducted approximately three months after time one measurements. At time two, weight and height was measured for all participants who completed time one measurements. If a participant was absent from school, he or she did not complete time two measurements and was excluded from analyses. Participants were not compensated for their participation in the current study.

Data Analytic Strategy

Data analysis was completed using SPSS, version 24.0. Descriptive statistics and bivariate correlations were computed for demographic variables and main study variables. Associations between demographic variables (age, gender, ethnicity, parent education, free lunch, immigration status, and physical activity) and change in BMIz

were tested using Pearson correlations. The assumptions of linearity, independence of errors, homoscedasticity, unusual points, and normality of residuals were met.

Hypothesis 1: Baseline acculturative stress scores will be associated with the baseline Total emotional eating scores, Anxiety/Anger/Frustration emotional eating scores, Depression emotional eating scores, and Unsettled emotional eating scores.

Pearson correlations were conducted to examine the relationship between acculturative stress and emotional eating at time 1 in both Latino/a and non-Latino/adolescents. The analyses determined if acculturative stress scores were positively correlated with the baseline Total emotional eating scores, Anxiety/Anger/Frustrated emotional eating scores, Depressed emotional scores, and Unsettled emotional eating scores. Pearson's Product Moment Correlations effect sizes were classified as small (.10-.29), medium (.30-.49), and large ($\geq .50$) (Cohen, 1988).

Hypothesis 2: Baseline Total emotional eating scores, Anxiety/Anger/Frustrated emotional eating scores, Depressed emotional eating scores, and Unsettled emotional eating scores will be associated change in body mass index between time one and time two.

Pearson correlations were used to examine the relationship between baseline emotional eating and change in BMIz scores in Latino/a and non-Latino/a adolescents. The analyses determined if baseline Total emotional eating scores, Anxiety/Anger/Frustrated emotional eating scores, Depressed emotional scores, and Unsettled emotional eating scores were with change in BMIz scores. Pearson's Product Moment Correlations effect sizes were classified as small (.10-.29), medium (.30-.49), and large ($\geq .50$) (Cohen, 1988).

Hypothesis 3: Baseline acculturative stress will be associated with change in body mass index between time one and time two

Pearson correlations were used to examine the relationship between baseline acculturative stress and change in BMIz scores between time one and time two in Latino/a and non-Latino/a adolescents. The analyses determined if acculturative stress was positively correlated with change in BMIz scores. Pearson's Product Moment Correlations effect sizes were classified as small (.10-.29), medium (.30-.49), and large ($\geq .50$) (Cohen, 1988).

Hypothesis 4: The Total score on the Emotional Eating Scale for Children and Adolescents will moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two.

A hierarchical linear regression analysis was conducted to predict change in BMIz scores using baseline acculturative stress scores and Total emotional eating scores (EES-C) in the Latino/a sample. Perceived stress was entered in the first step as a control variable to ensure measurement of effects above and beyond basic stressors. Pearson correlations were calculated to determine associations between all demographics variables and change in BMIz scores; no additional control variables were entered in step one because no demographic variables were significantly associated with change in BMIz scores in Latino/a adolescent. The acculturative stress score at time 1 was entered in the second step. In the third step, the Total score on the Emotional Eating Scale for Children and Adolescents was entered. In the fourth step, the interaction term between acculturative stress and the Total EES-C score was entered. The interaction term was calculated by multiplying the baseline acculturative stress score by the Total EES-C

score. To reduce potential problems with multicollinearity, acculturative stress and total emotional eating scores were centered prior to calculating the interaction term.

It was predicted that the addition of the interaction term to the regression analysis would result in a significant increase in variance explained (R^2 change, $p < .05$). In order to replicate Belcher and colleagues (2011), the process was repeated using Latina females. Additionally, for comparison, the process was repeated using the non-Latino/a sample with the exception of entering receiving free or reduced lunch as an additional control variable in step one. Pearson correlations were calculated to determine associations between all demographics variables and change in BMIz scores; receiving free or reduced lunch was the only demographic variable significantly associated with change in BMIz scores in the non-Latino/a population.

Additionally, binary logistic regressions were conducted to consider the relationship between acculturative stress, total emotional eating, and follow-up weight classification in Latino/a adolescents. Follow-up body mass index was dichotomized and used as the dependent variable. The first model compared normal weight to overweight and obese adolescents; participants whose body mass index fell between the 5th and 84.99th percentile were classified as normal weight and participants whose body mass index fell above the 85th percentile were classified as overweight and obese. Model two compared overweight to obese adolescents; participants whose body mass index fell between the 85th and 94.99th percentile were classified as overweight and participants whose body mass index fell above the 95th percentile were classified as obese. Perceived stress was entered in step one as a control variable. Acculturative stress was entered in step two, total emotional eating was entered in step three, and the interaction term

between acculturative stress and total emotional eating was entered in step four. It was predicted that the addition of the interaction term would significantly increase the odds of being classified in a higher weight category (X^2 change, $p < .05$). The binary logistic regressions were repeated using the non-Latino/a sample with the exception of entering receiving free or reduced lunch as an additional control variable in step one.

Hypothesis 5: The Anxiety/Anger/Frustrated subscale of the Emotional Eating Scale for Children and Adolescents will moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two

The same hierarchical linear regressions described above was repeated using the Anxiety/Anger/Frustrated subscale of emotional eating to examine the moderating effects of emotional eating between acculturative stress and change in BMIz scores in Latino/a adolescents. The interaction term was calculated by multiplying the baseline acculturative stress score by the EES-C-AAF score. To reduce potential problems with multicollinearity, acculturative stress and Anxiety/Anger/Frustrated emotional eating scores were centered prior to calculating the interaction term. It was predicted that the addition of the interaction term to the regression analysis would result in a significant increase in variance explained (R^2 , $p < .05$).

The two binary logistic regressions were repeated using Anxiety/Anger/Frustrated emotional eating scores. Perceived stress was entered in step one as a control variable. Acculturative stress was entered in step two, Anxiety/Anger/Frustrated emotional eating was entered in step three, and the interaction term between acculturative stress and emotional eating was entered in step four. It was predicted that the addition of the interaction term would significantly increase the odds of being classified in a higher

weight category (X^2 change, $p < .05$). For comparison, the same regression models were repeated using the Latina female sample and the non-Latino/a sample.

Hypothesis 6: The Depressed subscale of the Emotional Eating Scale for Children and Adolescents will moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two.

The same hierarchical linear regression described above was repeated using the Depressed subscale of emotional eating to examine the moderating effects of emotional eating between acculturative stress and change in BMIz scores in Latino/a adolescents. The interaction term was calculated by multiplying the baseline acculturative stress score by the EES-C-DEP score. To reduce potential problems with multicollinearity, acculturative stress and Depressed emotional eating scores were centered prior to calculating the interaction term. It was predicted that the addition of the interaction term to the regression analysis would result in a significant increase in variance explained (R^2 , $p < .05$).

The two binary logistic regressions were repeated using Depressed emotional eating scores. Perceived stress was entered in step one as a control variable. Acculturative stress was entered in step two, Depressed emotional eating was entered in step three, and the interaction term between acculturative stress and emotional eating was entered in step four. It was predicted that the addition of the interaction term would significantly increase the odds of being classified in a higher weight category (X^2 change, $p < .05$). For comparison, the same regression models were repeated using the Latina female sample and the non-Latino/a sample.

Hypothesis 7: The Unsettled subscale of the Emotional Eating Scale for Children and Adolescents will moderate the relationship between baseline acculturative stress and change in body mass index between time one and time two.

The same hierarchical linear regression described above was repeated using the Unsettled subscale of emotional eating to examine the moderating effects of emotional eating between acculturative stress and change in BMIz scores in Latino/a adolescents. The interaction term was calculated by multiplying the baseline acculturative stress score by the EES-C-UNS score. To reduce potential problems with multicollinearity, acculturative stress and Unsettled emotional eating scores were centered prior to calculating the interaction term and prior to regression analyses. It was predicted that the addition of the interaction term to the regression analysis would result in a significant increase in variance explained (R^2 , $p < .05$).

The two binary logistic regressions were repeated using Unsettled emotional eating scores. Perceived stress was entered in step one as a control variable. Acculturative stress was entered in step two, Unsettled emotional eating was entered in step three, and the interaction term between acculturative stress and emotional eating was entered in step four. It was predicted that the addition of the interaction term would significantly increase the odds of being classified in a higher weight category (X^2 change, $p < .05$). For comparison, the same regression models were repeated using the Latina female sample and the non-Latino/a sample.

CHAPTER THREE

Results

Descriptive Statistics

Descriptive statistics for the Latino/a and non-Latino/a samples are presented in Table 1. In the Latino/a sample, scores on the Emotional Eating Scale ranged from a minimum of 25 to a maximum of 97 with a mean score of 54.8 ($SD = 18.11$). Perceived Stress Scale scores ranged from 5 to 35 with a mean score of 20.09 ($SD = 6.33$). Scores on the Adolescent Food Habits Checklist ranged from 2 to 19 with a mean score of 8.33 ($SD = 3.86$). Scores on the SAFE ranged from 18 to 132 with a mean score of 63.05 ($SD = 26.22$), while the mean acculturative stress score on the SAFE was 30.81, ($SD = 15.36$). In the non-Latino/a population, scores on the Emotional Eating Scale ranged from a minimum of 25 to a maximum of 97 with a mean score of 52.68 ($SD = 17.01$). Perceived Stress Scale scores ranged from 1 to 40 with a mean score of 19.08 ($SD = 7.01$). Scores on the Adolescent Food Habits Checklist ranged from 0 to 20 with a mean score of 8.51 ($SD = 4.29$). Scores on the SAFE ranged from 4 to 132 with a mean score of 55.05 ($SD = 26.12$), while the mean acculturative stress score on the SAFE was 25.64, ($SD = 14.34$).

Table 1, *Descriptive Statistics*

| Characteristic | Non-Latino/a | | | Latino/a | | | Effect Size |
|----------------|------------------|----------------|-------|------------------|----------------|-------|-------------|
| | <i>N</i> or Mean | % or <i>SD</i> | Range | <i>N</i> or Mean | % or <i>SD</i> | Range | |
| Age | 13.68 | 0.79 | 12–17 | 13.69 | 0.876 | 12–17 | – |
| Gender | | | | | | | – |
| Male | 101 | 36.3 | – | 44 | 26.2 | – | – |
| Female | 177 | 63.7 | – | 124 | 73.8 | – | – |

(continued)

| Characteristic | Non-Latino/a | | | Latino/a | | | Effect Size |
|-----------------------------------|------------------|---------|------------|------------------|---------|-----------|-------------|
| | <i>N</i> or Mean | % or SD | Range | <i>N</i> or Mean | % or SD | Range | |
| Race/Ethnicity | | | | | | | |
| White | 176 | 39.5 | – | | | | |
| African-American | 65 | 14.6 | – | – | – | – | – |
| Latino/a | – | – | – | 168 | 37.7 | – | – |
| Asian | 16 | 3.6 | – | – | – | – | – |
| Other | 21 | 4.7 | – | – | – | – | – |
| Recent Immigration | | | – | – | – | – | – |
| Yes | 50 | 18 | | | | | |
| No | 228 | 82 | – | 125 | 74.4 | – | – |
| Free/reduced lunch | | | – | 43 | 25.6 | – | – |
| Yes | 80 | 28.8 | | | | | |
| No | 198 | 71.2 | – | 112 | 66.7 | – | – |
| Parent Education | | | – | 56 | 33.3 | – | – |
| Some high school or less | 17 | 6.1 | | 71 | 42.3 | | |
| High school diploma/GED | 42 | 15.1 | – | 31 | 18.5 | – | – |
| Vocational school or some college | 28 | 10.1 | – | 21 | 12.5 | – | – |
| College degree | 98 | 35.3 | – | 28 | 16.7 | – | – |
| Professional or graduate degree | 93 | 33.5 | – | 17 | 10.1 | – | – |
| Physical activity | | | – | | | – | – |
| 0 minutes | 4 | 1.4 | | 4 | 2.4 | | |
| 1-15 minutes | 34 | 12.2 | – | 16 | 9.5 | – | – |
| 16-30 minutes | 32 | 11.5 | – | 31 | 18.5 | – | – |
| 31-45 minutes | 45 | 16.2 | – | 35 | 20.8 | – | – |
| 46-60 minutes | 48 | 17.3 | – | 35 | 20.8 | – | – |
| More than 60 minutes | 115 | 41.4 | – | 47 | 28 | – | – |
| BMI Time one | 22.52 | 4.58 | 13.3–40.5 | 23.95 | 5.26 | 15.7–41.9 | 0.30 |
| BMIz Time-one | -.11 | .94 | -1.99-3.56 | .18 | 1.07 | -1.5-3.85 | 0.29 |

(continued)

| Characteristic | Non-Latino/a | | | Latino/a | | | Effect Size |
|----------------------------------|------------------|---------|------------|------------------|---------|------------|-------------|
| | <i>N</i> or Mean | % or SD | Range | <i>N</i> or Mean | % or SD | Range | |
| BMI percentile | | | | | | | |
| Time-one | 70.48 | 24.51 | 0–99.6 | 76.37 | 23.41 | 3.3–99.7 | 0.24 |
| BMI Time-two | 22.47 | 4.61 | 13.9–42.6 | 24.07 | 5.37 | 16.1–44.9 | 0.33 |
| BMIz Time-two | -.12 | .93 | -1.84-3.93 | .20 | 1.08 | -1.40-4.40 | 0.32 |
| BMI percentile | | | | | | | |
| Time-two | 68.72 | 25.3 | 0–99.6 | 75.83 | 23.58 | 4.9–99.8 | 0.29 |
| BMI classification | | | | | | | |
| time-one | | | | | | | |
| Normal weight | 169 | 61.7 | | | | | |
| Overweight | 58 | 21.2 | – | 86 | 51.5 | – | – |
| Obese | 47 | 17.2 | – | 39 | 23.3 | – | – |
| BMI classification | | | | | | | – |
| time-two | | | – | 42 | 25.1 | – | |
| Normal weight | 167 | 65.5 | | | | | |
| Overweight | 48 | 18.8 | – | 81 | 52.6 | – | – |
| Obese | 40 | 15.7 | – | 32 | 20.8 | – | – |
| Emotional Eating Scale | | | – | 41 | 26.6 | – | – |
| Anger/Anxiety/Frustrated | 22.06 | 8.55 | 12–60 | 23.27 | 9.56 | 12–60 | 0.14 |
| Depressed | 16.58 | 5.88 | 7–35 | 16.78 | 6.38 | 7–33 | 0.03 |
| Unsettled | 7.74 | 3.09 | 4–20 | 8.11 | 3.25 | 4–20 | 0.12 |
| Total | 52.68 | 17.01 | 25–97 | 54.8 | 18.11 | 25–97 | 0.12 |
| High emotional eater | 127 | 54.3 | – | 89 | 53 | – | – |
| Low emotional eater | 151 | 45.7 | – | 79 | 47 | – | – |
| Perceived Stress Scale | | | | | | | |
| Total | 19.08 | 7.01 | 1–40 | 20.09 | 6.33 | 5–35 | – |
| Adolescent Food Habits Checklist | | | | | | | |
| Total | 8.51 | 4.29 | 0–20 | 8.33 | 3.86 | 1.74–19 | – |
| SAFE | | | | | | | |
| General | 29.66 | 13.93 | 0–70 | 32.39 | 13.57 | 7–70 | 0.20 |
| Acculturative | 25.64 | 14.34 | 0–74 | 30.81 | 15.36 | 4–78 | 0.35 |
| Process | 17.06 | 10.09 | 0–50 | 21.1 | 11.19 | 2–53 | 0.38 |
| Discrimination | 8.58 | 5.36 | 0–27 | 9.71 | 5.34 | 0–26 | 0.21 |
| Total | 55.05 | 26.12 | 4-132 | 63.05 | 26.22 | 18-132 | 0.21 |

Gender

The Latino/a sample consisted of 124 females (73.8%) and 44 males (26.2%). There was a significant effect for gender on the following: Total Emotional Eating, $t(168) = -2.60, p = .01$, Anxiety, Anger, and Frustration Emotional Eating, $t(168) = -2.68, p = .008$, and Unsettled Emotional Eating, $t(168) = -2.17, p = .03$, with females consistently reporting higher levels of emotional eating. Additionally, females endorsed significantly higher rates of perceived stress, $t(168) = -3.13, p = .002$, total stress as measured by the SAFE, $t(168) = -2.31, p = .02$, general stress as measured by the SAFE, $t(168) = -2.46, p = .02$, and process stress as measured by the SAFE, $t(168) = -2.05, p = .04$. There were no significant differences in healthy eating habits as measured by the Adolescent Food Habits Checklist or body mass index between males and females. Male and female participants were equally as likely to be classified as normal weight or as overweight and as overweight or as obese. The same patterns were observed in the non-Latino/a population.

Ethnicity and Immigration Generation

The ethnic make up of the current sample did not differ significantly from the ethnic make up of each school. At middle school one, 53.8 percent of adolescents identified as non-Hispanic white, 13 percent identified as African-American, 22.7 percent identified as Latino/a, 6.7 percent identified as Asian, and 3.8 percent identified as “other.” The total school population consists of 57 percent non-Hispanic white students, 10.4 percent African-American students, 25.2 percent Latino/a students, 5.4 percent Asian students, and 2.3 percent “other” students. At middle school two, 19.8 percent of adolescents identified as non-Hispanic white, 18.6 percent identified as African-

American, 55.4 percent identified as Latino/a, 0 percent identified as Asian, and 6.2 percent identified as “other.” The total school population consists of 27.2 percent non-Hispanic white students, 15 percent African-American students, 51.2 percent Latino/a students, 1 percent Asian students, and 2.2 percent “other” students. At the high school, 41.9 percent of adolescents identified as non-Hispanic white, 3.2 percent identified as African-American, 51.6 percent identified as Latino/a, 0 percent identified as Asian, and 3.2 percent identified as “other.” The total school population consists of 43.4 percent non-Hispanic white students, 7.2 percent African-American students, 46.1 percent Latino/a students, 0.2 percent Asian students, and 0.7 percent “other” students.

Both body mass index, $t(414) = -3.21, p = .001$, and body mass index percentile rank, $t(414) = -2.84, p = .005$, differed significantly between Latino/a and non-Latino/a adolescents. Mean change in BMIz scores were significantly higher in Latino/a adolescents than non-Latino/a adolescents such that Latino/a adolescents gained more weight between time one and time two, $t(414) = -2.54, p = .012$. Latino/a adolescents endorsed significantly higher SAFE scores on the general stress subscale, $t(444) = -2.02, p = .044$, acculturative stress subscale, $t(444) = -3.59, p < .001$, process stress subscale, $t(444) = -3.93, p < .001$, discrimination stress subscale, $t(444) = -2.17, p < .031$, and total stress scores, $t(444) = -3.13, p = .002$, than non-Latino/a adolescents. There were no significant differences in perceived stress on the Perceived Stress Scale or eating habits on the Adolescents Food Habits Checklist between Latino/a and non-Latino/a adolescents.

The sample was divided into recent immigrants and non-immigrants. Recent immigrants ($N = 125$ in the Latino/a sample, 74.4%, $N=50$ in the non-Latino/a sample,

18%) were defined as any participant who was born outside the United States, whose parents were born outside the United States, or whose grandparents were born outside the United States. Additionally, immigration generation was considered with Latino/a participants born outside the United States classified as first generation immigrants ($N = 12, 7.1\%$), Latino/a participants with parents born outside the United States classified as second generation immigrants ($N = 96, 57.1\%$), and Latino/a participants with grandparents born outside the United States classified as third generation immigrants ($N = 17, 10.1\%$).

Recent Latino/a immigrants were almost three times more likely to be obese than overweight than non-immigrants, $X^2 (1, N = 73) = 3.90, p = .048$, but did not have significantly different change in BMIz scores. Recent Latino/a immigrants were 2.8 times more likely to receive free lunch than non-immigrants, $X^2 (1, N = 168) = 8.27, p = .004$, and significantly less likely to have parents with college or graduate degrees, $X^2 (1, N = 168) = 33.14, p < .001$, suggesting that non-immigrants have higher socioeconomic status. Recent immigrants also endorsed significantly higher SAFE scores on the general stress subscale, $t(166) = -2.22, p = .028$, acculturative stress subscale, $t(168) = -4.10, p < .001$, process stress subscale, $t(168) = -4.27, p < .001$, discrimination stress subscale, $t(168) = -2.82, p = .005$, and the total stress score, $t(168) = -3.51, p = .001$, than non-immigrants. There were no significant differences in change in BMIz scores, emotional eating, stress, or eating habits between first, second, and third generation Latino/a immigrants.

Socioeconomic Status

Fewer adolescents in the current sample endorsed receiving free or reduced lunch compared to the total population at each school. At middle school one, 25.2 percent of the current sample endorsed receiving free or reduced lunch and 74.8 percent did not. In the total school population, 28.7 percent of students receive free or reduced lunch. At middle school two, 65.5 percent of the current sample endorsed receiving free or reduced lunch and 34.5 percent did not. In the total school population, 78.7 percent of students receive free or reduced lunch. At the high school, 51.6 percent of the current sample endorsed receiving free or reduced lunch and 48.4 percent did not. In the total school population, 70.4 percent of the students receive free or reduced lunch.

112 Latino/a participants (66.7%) reported that they receive free or reduced lunch compared to 56 (33.3%) who did not. Follow-up body mass index, emotional eating, and stress did not differ between adolescents receiving or not receiving free or reduced lunches, but those receiving free or reduced lunch demonstrated significantly higher change in BMIz scores between time one and time two. In the non-Latino sample, adolescents receiving free or reduced lunch had a significantly higher mean follow-up body mass index, $t(259) = 2.89, p = .004$, than participants not receiving free or reduced lunch. When asked to select their parents' highest level of education, 71 Latino/a participants selected some high school or less (42.3%), 31 selected high school diploma or GED (18.5%), 21 selected vocational school or some college (12.5%), 28 selected college degree (16.7%), and 17 selected professional or graduate degree (10.1%). An analysis of variance showed significant effects of parent education on Depressed emotional eating in Latino/a adolescents, $F(4,163) = 3.23, p = .014$. Post hoc analyses

were conducted using Tukey's post hoc test and determined that participants whose parents completed some high school reported significantly lower Depressed emotional eating ($M = 8.14$, $SD = 5.95$) than participants whose parents received a college degree ($M = 13.00$, $SD = 7.35$). There were no differences between parent's level of education and other domains of emotional eating, any domain of stress, healthy eating patterns, or physical activity in Latino/a adolescents.

In the non-Latino/a population, level of parents education had significant effects on total stress, $F(4,273) = 3.10$, $p = .016$, acculturative stress, $F(4,273) = 3.18$, $p = .014$, process stress, $F(4,273) = 3.16$, $p = .015$, and discrimination stress, $F(4,273) = 2.97$, $p = .02$. Across domains of stress, participants whose parents received a college degree reported the highest levels of stress. Follow-up body mass index and emotional eating did not differ based on level of parent education in the non-Latino/a sample.

Physical Activity

In the Latino/a sample, 4 participants (2.4%) reported that they engage in no physical activity, 16 (9.5%) reported that they engage in 1 to 15 minutes of physical activity per day, 31 (18.5%) reported that they engage in 16 to 30 minutes of physical activity per day, 35 (20.8%) reported that they engage in 31-45 minutes of physical activity per day, 35 (20.8%) reported that they engage in 46-60 minutes of physical activity per day, and 47 (28%) reported that they engage in more than 60 minutes of physical activity per day. Analyses of variance indicated that the effect of physical activity was significant in total Anger/Anxiety/Frustrated eating, $F(5, 162) = 2.64$, $p = .025$, perceived stress $F(5, 162) = 2.83$, $p = .018$, total stress as measured by the SAFE, $F(5, 162) = 3.20$, $p = .01$, general stress as measured by the SAFE, $F(5, 162) = 2.48$, $p =$

.03, acculturative stress as measured by the SAFE, $F(5, 162) = 3.12, p = .01$, and process stress as measured by the SAFE, $F(5, 162) = 3.65, p = .04$. The general trend suggests that participants who exercise less per day report higher levels of stress on all domains. The majority of non-Latino participants, approximately 51 percent, reported that they engage in more than 60 minutes of physical activity per day ($N = 115$). In the non-Latino/a sample, only total stress, $F(5, 272) = 2.55, p = .03$, acculturative stress, $F(5, 272) = 2.33, p = .04$, and process stress, $F(5, 272) = 2.73, p = .02$, were affected by level of physical activity. Again, participants who exercised less per day report higher levels of stress.

Body Mass Index

At time one, body mass indices ranged from 15.7 to 41.9 with a mean body mass index of 23.95 ($SD = 5.26$) in Latino/a adolescents. Percentile ranks ranged from 3.3 to 99.7, with a mean percentile rank of 76.27, ($SD = 23.41$) and BMIz scores ranged from -2.86 to 1.11, with a mean BMIz score of .15 ($SD = .97$). 86 Latino/a participants were classified as normal weight (51.5%), 39 were classified as overweight (23.3%), and 42 were classified as obese (25.1%). At time two, Latino/a body mass indices ranged from 16.1 to 44.9 with a mean body mass index of 24.07 ($SD = 5.37$). Percentile ranks ranged from 4.9 to 99.8 with a mean percentile rank of 75.83 ($SD = 23.58$) and BMIz scores ranged from -2.67 to 1.14, with a mean BMIz score of .15 ($SD = .18$). 81 adolescents were classified as normal weight (52.6%), 32 were classified as overweight (20.8%), and 41 were classified as obese (26.6%).

Mean BMIz scores increased significantly by .05 (95% CI -.07 to -.02) in Latino/a adolescents between time-one and time-two. 3 Latino/a participants moved from normal

weight classification to overweight classification and 2 participants moved from overweight classification to normal weight classification. The pattern of change was not significant, $X^2(1, N = 154) = 134.61, p = 1.0$. 4 Latino/a participants moved from an overweight classification to an obese classification and 1 participant moved from an obese classification to an overweight classification; the pattern of change was not significant, $X^2(1, N = 70) = 51.56, p = .38$. In non-Latino/a adolescents, there was no significant change in mean BMIz score between time-one and time-two.

In Latino/a adolescents, there were no significant differences in emotional eating and stress between normal weight adolescents and overweight or obese adolescents. In the non-Latino/a sample, overweight and obese adolescents endorsed significantly higher perceived stress, $t(253) = -3.51, p = .001$, higher total stress as measured by the SAFE, $t(253) = -3.26, p = .001$, general stress as measured by the SAFE, $t(253) = -2.49, p = .013$, acculturative stress as measured by the SAFE, $t(253) = -3.22, p = .001$, process stress as measured by the SAFE, $t(253) = -3.08, p = .002$, and discrimination stress as measured by the SAFE, $t(253) = -2.80, p = .006$, than normal weight adolescents. There were no significant differences between overweight and obese adolescents in the non-Latino/a sample.

Emotional Eating Scores

In the Latino/a population, the total score on the Emotional Eating Scale for Children and Adolescents ranged from 25 to 97 with a mean score of 53.48 ($SD = 17.84$). Low and high emotional eating classification was determined with a median split as recommended by Vannucci and colleagues (2012); the median score for total emotional eating in the present sample of Latino/a adolescents was 54. Therefore, participants with

total scores less than or equal to 54 were classified as low emotional eaters ($N = 79, 47\%$) and participants with total scores greater than 54 were classified as high emotional eaters ($N = 89, 53\%$). Median scores for low and high emotional eaters were 43 and 65, respectively.

There was no significant difference in gender, parent education, or physical activity between high and low emotional eaters in the Latino/a sample. High and low emotional eaters were equally as likely to be classified as normal weight verses overweight and as overweight verses obese. First-generation Latino/a participants were significantly more likely to be classified as high emotional eaters than second-generation Latino/a participants, $X^2 (2, N = 114) = 12.01, p = .002$. High emotional eaters reported total stress as measured by the SAFE, $t(168) = -2.08, p = .04$ and general stress, $t(168) = -2.40, p = .02$ and had significantly higher mean follow-up body mass index, $t(168) = 2.43, p = .02$ than low emotional eaters. Adolescents in the non-Latino/a population demonstrated the same trends, with high emotional eaters reporting higher stress than low emotional eaters. Latino/a participants were compared to all other races combined; Latino/a participants were significantly more likely to be high emotional eaters than non-Latino/a participants, $X^2 (1, N = 446) = 3.92, p = .048$.

Bivariate Correlations

Hypothesis 1: As predicted, baseline acculturative stress was significantly associated with total emotional eating, $r(168) = .24, p < .01$, Anger/Anxiety/Frustrated emotional eating, $r(168) = .23, p < .01$, and Depressed emotional eating, $r(168) = .18, p < .05$, in Latino/a adolescents. Acculturative stress was not associated with Unsettled emotional eating, $r(168) = .15, p > .05$. Further, total stress as measured by the SAFE

was significantly associated with total emotional eating, $r(168) = .23$, $p < .01$, Anger/Anxiety/Frustrated emotional eating, $r(168) = .26$, $p < .01$, and Depressed emotional eating, $r(168) = .22$, $p < .05$. General stress as measured by the SAFE was significantly associated with total emotional eating, $r(168) = .24$, $p < .01$, Anger/Anxiety/Frustrated emotional eating, $r(168) = .26$, $p < .05$, and Depressed emotional eating, $r(168) = .22$, $p < .01$. Process stress as measured by the SAFE was significantly associated with total emotional eating, $r(168) = .23$, $p < .05$, Anger/Anxiety/Frustrated emotional eating, $r(168) = .26$, $p < .01$, Depressed emotional eating, $r(168) = .18$, $p < .05$, and Unsettled emotional eating, $r(168) = .18$, $p < .05$. Conversely, discrimination stress as measured by the SAFE was not associated with any domain of emotional eating. Perceived stress as measured by the Perceived Stress Scale, however, was significantly associated with total emotional eating, $r(168) = .24$, $p < .01$, Anger/Anxiety/Frustrated emotional eating, $r(168) = .26$, $p < .05$, Depressed emotional eating, $r(168) = .19$, $p < .05$, and Unsettled emotional eating, $r(168) = .22$, $p < .01$. Overall, it appears that higher levels of stress are associated with higher levels of emotional eating in Latino/a adolescents; however, the associations are small (see Table 2). Additionally, higher levels of acculturative stress were positively associated with emotional eating in both adolescents receiving free or reduced lunch and those who do not.

Hypothesis 2: It was predicted that emotional eating at baseline would be significantly associated with change in body mass index between time one and time two. In the Latino/a sample, change in BMIz score was not significantly correlated with total emotional eating or any subscale of the Emotional Eating Scale, but higher emotional

eating scores trended towards weight gain over time. The same trend was observed in normal, overweight, and obese Latino/a adolescents separately. Similarly, neither total emotional eating nor any subscale of the Emotional Eating Scale was significantly associated with change in body mass index in the non-Latino sample. However, the association trended in a negative direction in non-Latino/a adolescents such that higher emotional eating was associated with either no change or weight loss over time. Only in obese non-Latino/a adolescents was higher emotional eating non-significantly related to weight gain over time. Neither participants receiving free or reduced lunch nor those who did not demonstrated an association between emotional eating and change in body mass index between time one and time two. The association trended in a positive direction in adolescents receiving free or reduced lunch, while the association trended in a negative direction in adolescents who did not.

Hypothesis 3: Although acculturative stress as measured by the SAFE was associated with higher follow-up body mass index in normal weight Latino adolescents, $r(81) = .23$, $p = .04$, it was not correlated with change in body mass index between time one and time two in Latino/a adolescents. In normal weight and overweight Latino/a adolescents, higher acculturative stress was non-significantly associated with weight gain over time, but the reverse was found in obese Latino/a adolescents such that higher acculturative stress was associated with weight loss over time. The same patterns were observed between scores on the Perceived Stress Scale and change in BMIz; higher stress was non-significantly associated with weight gain over time in normal and overweight Latino/a adolescents, but was non-significantly associated with weight loss over time in obese Latino/a adolescents. Total stress, general stress, process stress, and discrimination

stress were not associated with change in body mass index over time in Latino/a adolescents (see Table 2).

In the total non-Latino/a sample, acculturative stress was significantly associated with change in body mass index between time one and time two, $r(259) = -.13$, $p = .04$. Total stress as measured by the SAFE, $r(259) = -.13$, $p = .04$, general stress as measured by the SAFE, $r(259) = -.15$, $p = .02$, and discrimination stress as measured by the SAFE, $r(259) = -.14$, $p = .03$, were also associated with change in body mass index between time one and time two. In non-Latino/a adolescents, it appears that stress was associated with weight loss over time (see Table 2). When examining participants receiving and not receiving free or reduced lunch, there was no association between acculturative stress and change in body mass index between time one and time two. In participants receiving free or reduced lunch, higher levels of acculturative stress trended towards weight loss over time whereas higher levels of acculturate stress trended towards weight gain over time in participants not receiving free or reduced lunch.

Moderation Models

Hypothesis 4: It was proposed that total emotional eating as measured by the Emotional Eating Scale would moderate the relationship between acculturative stress as measured by the SAFE and change in BMIz scores in Latino/a adolescents. In step one, perceived stress did not account for a significant amount of variance in BMIz change, $R^2 = .01$, $F(1, 153) = 1.83$, $p = .18$, nor did acculturative stress in step two, $R^2 = .013$, $F(2, 152) = 1.04$, $p = .61$, or total emotional eating in step three, $R^2 = .023$, $F(3, 151) = 1.16$, $p = .24$.

Table 2. *Bivariate Correlations for Major Study Variables in Latino/a and Non-Latino/a Populations*

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|-------|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
| 1. BMI Time One | – | -.08 | -.05 | .01 | -.06 | -.11 | .08 | .13 | .10 | .08 | .10 | .05 | .17* |
| 2. ΔBMIz | .04 | – | .11 | .11 | .09 | .15 | .11 | .01 | .007 | -.02 | .02 | .04 | -.03 |
| 3. Emotional Eating Total | .02 | .01 | – | .93** | .89** | .79** | .24** | -.23** | .25** | .24** | .21** | .23* | .13 |
| 4. Emotional Eating-Anger/Anxiety /Frustrated | -.002 | -.02 | .92** | – | .72** | .70** | .26** | -.19* | .26** | .23** | .24** | .26** | .14 |
| 5. Emotional Eating-Depressed | .06 | -.03 | .87** | .69** | – | .614** | .19* | -.23** | .22** | .22** | .18* | .18* | .12 |
| 6. Emotional Eating-Unsettled | .03 | -.04 | .79** | .68** | .60** | – | .22** | -.12 | .15 | .11 | .15 | .18* | .06 |
| 7. Perceived Stress Score | .08 | .09 | .23** | .24** | .17** | .18* | – | -.09 | .51** | .41** | .52** | .52** | .40** |
| 8. Adolescent Food Habits Checklist | .15* | -.05 | -.29** | -.25** | -.27** | -.22** | -.13** | – | -.11 | -.04 | -.15 | -.17* | -.06 |
| 9. SAFE- Total | .08 | -.13* | .20** | .21** | .15** | .13* | .57** | -.04 | – | .91** | .93** | .89** | .80** |
| 10. SAFE- General | .08 | -.15* | .21** | .21** | .19** | .11* | .48** | -.02 | .89** | – | .69** | .66** | .61** |
| 11. SAFE- Acculturative | .08 | -.13* | .19** | .21** | .11** | .15** | .58** | -.07 | .93** | .71** | – | .97** | .85** |
| 12. SAFE- Process | .11 | -.11 | .20** | .22** | .11* | .16** | .55** | -.08 | .88** | .64** | .96* | – | .69** |
| 13. SAFE- Discrimination | .003 | -.14* | .14** | .16** | .09 | .09 | .52** | -.03 | .85** | .69** | .86** | .70** | – |

* $p < .05$. ** $p < .01$.

Note: Values above the line in the shaded are results for the Latino/a population. Values below the line in the non-shaded area are results for the non-Latino/a population

The interaction term entered in step four did not significantly improve the regression model, $R^2 = .023$, $F(4, 150) = .86$, $p = .98$, thus total emotional eating failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two (see Table 3). Similarly, total emotional eating failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in Latina females.

Table 3. *Change in BMIz Predicted from Acculturative Stress and Total Emotional Eating*

| Predictor | | Non-Latino/a Sample | | | | | Latino/a Sample | | | | |
|---|-------|---------------------|--------------|--------|------|------|-----------------|------------|-----|------|-----|
| | | R^2 | ΔR^2 | p | F | p | R^2 | ΔR | p | F | p |
| Control Variable(s) | b_1 | .01 | .005 | .50 | .69 | .50 | .01 | .012 | .18 | 1.82 | .18 |
| Acculturative Stress | b_2 | .03 | .027 | .009** | 2.81 | .04* | .01 | .002 | .61 | 1.04 | .36 |
| Emotional Eating- Total | b_3 | .03 | .000 | .92 | 2.10 | .08 | .02 | .009 | .24 | 1.16 | .33 |
| Acculturative Stress x Emotional Eating | b_4 | .03 | .000 | .93 | 1.68 | .14 | .02 | .000 | .98 | .86 | .49 |

* $p < .05$. ** $p < .01$

In the non-Latino/a sample, control variables (i.e., free lunch and perceived stress) failed to contribute significantly to the regression model, $R^2 = .005$, $F(2, 256) = .69$, $p = .50$. Adding acculturative stress in step two significantly increased the amount of variance explained, $R^2 = .032$, $F(3, 255) = 2.81$, $p = .009$, but only explained 2.1 percent of the variation in change in body mass index between time one and time two. Adding the total emotional eating score in step three, $R^2 = .032$, $F(4, 254) = 2.10$, $p = .92$, and the interaction term between acculturative stress and total emotional eating in step four, $R^2 = .032$, $F(5, 253) = 1.68$, $p = .93$, had no effect on the regression model and failed to

increase the variance explained. Thus, overall emotional eating also failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in non-Latino adolescents (see Table 3).

In a logistic regression, acculturative stress scores as measured by the SAFE had no effect on the likelihood of Latino/a adolescents being classified as normal weight versus overweight after controlling for perceived stress, nor did total emotional eating scores. The interaction between acculturative stress and total emotional eating did not affect the chance of the adolescent being classified as overweight versus normal weight and thus failed to moderate the relationship between stress and follow-up weight classification. In non-Latino adolescents, acculturative stress, total emotional eating, nor the interaction term affected the likelihood of being classified as normal weight versus overweight.

In a logistic regression, acculturative stress in Latino/a adolescents failed to predict weight classification, but total emotional eating significantly increased the chance of being categorized as overweight versus obese, $X^2(1) = 5.81, p = .016$. Total emotional eating failed to moderate the relationship between acculturative stress and weight classification. Similar results were found in the non-Latino/a adolescents; acculturative stress as measured by the SAFE did not affect the likelihood of being classified as obese versus overweight. Total emotional eating significantly predicted weight category, $X^2(1) = 8.51, p = .004$, but the interaction between acculturative stress and total emotional eating did not significantly contribute to the regression model.

Hypothesis 5: The Anxiety/Anger/Frustrated subscale of the Emotional Eating Scale failed to moderate the relationship between acculturative stress and change in body

mass index between time one and time two in Latino/a adolescents. Neither the addition of acculturative stress, $R^2 = .015$, $F(2, 152) = 1.17$, $p = .31$, nor the Anxiety/Anger/Frustrated subscale of emotional eating, $R^2 = .021$, $F(3, 151) = 1.07$, $p = .29$, significantly increased the variance of change in BMIz explained beyond perceived stress. The interaction between acculturative stress and the Anxiety/Anger/Frustrated subscale of emotional eating had no significant impact on the regression equation, $R^2 = .021$, $F(4, 150) = .81$, $p = .79$ (see Table 4). In the non-Latino/a sample, Anger/Anxiety/Frustrated emotional eating failed to moderate the relationship between acculturative stress and change in BMIz, $R^2 = .032$, $F(5, 253) = 1.68$, $p = .98$ (see Table 4). Similarly, Anger/Anxiety/Frustrated emotional eating failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in Latina females.

Table 4. *Change in BMIz Predicted from Acculturative Stress and Anger/Anxiety/Frustrated Emotional Eating*

| Predictor | | Non-Latino/a Sample | | | | | Latino/a Sample | | | | |
|---|-------|---------------------|--------------|--------|------|------|-----------------|------------|-----|------|-----|
| | | R^2 | ΔR^2 | p | F | p | R^2 | ΔR | p | F | p |
| Control Variable(s) | b_1 | .01 | .005 | .50 | .69 | .50 | .01 | .012 | .18 | 1.82 | .18 |
| Acculturative Stress | b_2 | .03 | .027 | .009** | 2.81 | .04* | .01 | .002 | .61 | 1.04 | .36 |
| Emotional Eating- AAF | b_3 | .03 | .000 | .88 | 2.10 | .08 | .02 | .007 | .29 | 1.07 | .37 |
| Acculturative Stress x Emotional Eating | b_4 | .03 | .000 | .98 | 1.68 | .14 | .02 | .000 | .79 | .81 | .52 |

* $p < .05$. ** $p < .01$

In a logistic regression, the interaction between acculturative stress and Anger/Anxiety/Frustrated emotional eating did not affect the chance of a Latino/a adolescent being classified as overweight versus normal weight or as obese versus overweight. Similarly, Anger/Anxiety/Frustrated emotional eating failed to moderate the relationship between stress and weight classification in normal weight, overweight, and obese non-Latino/a adolescents.

Hypothesis 6: The Depressed subscale of the Emotional Eating Scale failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in Latino/a adolescents. The addition of acculturative stress, $R^2 = .01$, $F(2, 151) = 1.17$, $p = .31$, and of the Depressed subscale of emotional eating, $R^2 = .019$, $F(3, 151) = .99$, $p = .34$, failed to significantly increase the proportion of variance of change in BMIz explained. The interaction between acculturative stress and the Depressed subscale had no impact on the regression equation, $R^2 = .20$, $F(4, 150) = .77$, $p = .75$, in Latino/a adolescents (see Table 5). Similarly, Depressed emotional eating failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in Latina females. In the non-Latino/a sample, Depressed emotional eating failed to moderate the relationship between acculturative stress and change in body mass index, $R^2 = .034$, $F(5, 253) = 1.77$, $p = .60$ (see Table 5).

In logistic regressions, the interaction between acculturative stress and Depressed emotional eating failed to moderate the relationship between acculturative stress and weight classification. Acculturative stress did not effect Latino/a adolescents' likelihood of being classified as normal weight versus overweight or as overweight versus obese, but higher rates of Depressed emotional eating, $X^2(1) = 5.22$, $p = .022$, were significantly

associated with a lower likelihood of being classified as obese. Depressed emotional eating failed to moderate the relationship between acculturative stress and being classified as normal versus overweight and as overweight versus obese.

Table 5. *Change in BMIz Predicted from Acculturative Stress and Depressed Emotional Eating*

| Predictor | | Non-Latino/a Sample | | | | | Latino/a Sample | | | | |
|---|-------|---------------------|--------------|--------|------|------|-----------------|------------|-----|------|-----|
| | | R^2 | ΔR^2 | p | F | p | R^2 | ΔR | p | F | p |
| Control Variable(s) | b_1 | .01 | .005 | .50 | .69 | .50 | .01 | .012 | .18 | 1.82 | .18 |
| Acculturative Stress | b_2 | .03 | .027 | .009** | 2.81 | .04* | .01 | .002 | .61 | 1.04 | .36 |
| Emotional Eating- Dep | b_3 | .03 | .001 | .67 | 2.15 | .08 | .02 | .006 | .34 | .99 | .40 |
| Acculturative Stress x Emotional Eating | b_4 | .03 | .001 | .60 | 1.77 | .12 | .02 | .001 | .75 | .77 | .55 |

* $p < .05$. ** $p < .01$.

In a logistic regression using non-Latino adolescents, the interaction between acculturative stress and Depressed emotional eating did not affect the chance of an adolescent being classified as overweight versus normal weight. In another logistic regression, neither acculturative stress as measured by the SAFE nor Depressed emotional eating affected the likelihood of non-Latino/a adolescents being classified as obese versus overweight. The Depressed subscale of emotional eating failed to moderate the relationship between stress and weight classification in non-Latino/a adolescents.

Hypothesis 7: The Unsettled subscale of the Emotional Eating Scale failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in Latino/a adolescents, $R^2 = .033$, $F(4, 150) = 1.27$, $p = .83$. The addition of acculturative stress, $R^2 = .013$, $F(2, 152) = 1.04$, $p = .61$, failed to

significantly increase the proportion of variance in body mass index explained. The addition of the Unsettled subscale of emotional eating marginally improved the regression model, $R^2 = .019$, $F(3, 151) = 1.68$, $p = .09$, but the interaction term between acculturative stress and Unsettled emotional eating did not affect the model (see Table 6). Similarly, Unsettled emotional eating failed to moderate the relationship between acculturative stress and change in body mass index between time one and time two in Latina females. The interaction between acculturative stress and the Unsettled subscale had no impact on the regression equation, $R^2 = .034$, $F(5, 253) = 1.80$, $p = .54$, in non-Latino/a adolescents (see Table 6).

Table 6. *Change in BMIz Predicted from Acculturative Stress and Unsettled Emotional Eating*

| Predictor | | Non-Latino/a Sample | | | | | Latino/a Sample | | | | |
|---|-------|---------------------|--------------|--------|------|------|-----------------|------------|-----|------|-----|
| | | R^2 | ΔR^2 | p | F | p | R^2 | ΔR | p | F | p |
| Control Variable(s) | b_1 | .01 | .005 | .50 | .69 | .50 | .01 | .012 | .18 | 1.82 | .18 |
| Acculturative Stress | b_2 | .03 | .027 | .009** | 2.81 | .04* | .01 | .002 | .61 | 1.04 | .36 |
| Emotional Eating- Uns | b_3 | .03 | .001 | .67 | 2.12 | .08 | .03 | .02 | .09 | 1.68 | .17 |
| Acculturative Stress x Emotional Eating | b_4 | .03 | .001 | .60 | 1.77 | .12 | .03 | .00 | .83 | 1.27 | .29 |

* $p < .05$. ** $p < .01$.

It was hypothesized that Unsettled emotional eating would have a smaller effect on change in BMIz in Latino/a adolescents due to the subscale's lower explanatory power and internal consistency. However, Unsettled emotional eating explained the most variance in change BMIz after controlling for perceived stress and acculturative stress in Latino/a adolescents ($\Delta R = .019$) compared to total emotional eating ($\Delta R = .009$),

Anxiety/Anger/Frustrated emotional eating ($\Delta R = .007$), and Depressed emotional eating ($\Delta R = .006$).

In logistic regressions using Latino/a adolescents, the interaction between acculturative stress and Unsettled emotional eating did not affect the chance of an adolescent being classified as overweight versus normal weight or as obese versus overweight. The Unsettled subscale of emotional eating significantly predicted classification as obese versus overweight after controlling for stress, $X^2 (1) = 5.51, p = .02$, but failed to moderate the relationship between stress and weight classification in Latino/a adolescents. Unsettled emotional eating failed to moderate the relationship between acculturative stress and weight classification in non-Latino/a adolescents.

CHAPTER FOUR

Discussion

Summary

The objectives of this study were two-fold. First, the study aimed to fill a gap in the extant research examining emotional eating as a coping mechanism in Latino/a adolescents by testing a portion of Berry's model of acculturation. Specifically, the study examined if emotional eating strengthened the relationship between baseline acculturative stress scores and longitudinal change in body mass index. Second, the study sought to consider associations between acculturative stress, emotional eating, and longitudinal change in body mass index in a community sample of Latino/a adolescents and differences between Latino/a and non-Latino/a adolescents.

Differences between Latino/a and non-Latino/a Adolescents

Overall, results suggest significant differences between Latino/a and non-Latino/a adolescents. As expected, Latino/a adolescents endorsed significantly higher acculturative stress on the SAFE than non-Latino/a adolescents, as well as higher total stress, general stress, process stress, and discrimination stress (Rodriguez, Flores, Flores, Myers, & Vriesema, 2015; Cervantes, Cardoso, & Goldbach, 2015). Latino/a adolescents also demonstrated significantly higher body mass index percentile rank, were significantly more likely to be classified as overweight, and demonstrated significantly higher mean weight gain compared to non-Latino/a adolescents. These results are consistent with previous findings suggesting that obesity rates are disproportionately

higher among minority youth (Neumark-Sztainer, Story, Hannan, & Croll et al., 2002; Harrington, 2008).

Several factors may contribute to these findings, specifically lower levels of socioeconomic status and physical activity in Latino/a versus non-Latino/a adolescents. Latino/a adolescents demonstrated significantly lower levels of parent education and significantly higher rates of receiving free or reduced lunch than non-Latino/a adolescents; both proxy measures used to represent socioeconomic status in the current study were also associated with increased body weight. Latino/a adolescents were significantly less likely to engage in more than 60 minutes of physical activity per day compared to non-Latino/a adolescents. Specifically, approximately 51 percent of non-Latino/a adolescents endorsed engaging in more than 60 minutes of physical activity per day compared to only 28 percent of Latino/a adolescents. Both low socioeconomic status and inactivity are higher in Latino/a populations (DeNavas-Walt & Proctor, 2015; Ogden et al., 2014; Singh, Yu, Saihpush, & Kogan, 2008; CDC, 2003) and have been implicated in the development and maintenance of higher rates of obesity compared to non-Latino/a populations (Delva, O'Malley, & Johnston, 2007; Nord, 2011; Nackers & Appelhans, 2013; Reyes-Rodríguez et al., 2016; Buscemi, Beech, & Relyea, 2011).

Contrary to previous findings, Latino/a adolescents in the present sample did not report significantly higher levels of emotional eating than non-Latino/a adolescents (Jenkins et al., 2005). Further, eating habits did not significantly differ between Latino/a and non-Latino adolescents; both groups reported similar scores on Adolescent Food Habits Checklist. This finding is not concurrent with existing literature, which suggests that Latino/a adolescents eat a less healthful diet than both non-Hispanic whites and other

ethnic minorities (Allen et al., 2007; National Center for Health, 2007; Gordon-Larsen, Harris, Ward, & Popkin, 2003). In previous studies, emotional eating has been associated with increased intake of high-fat and salty foods; it is possible that the lack of difference in healthy eating between Latino/a and non-Latino/a adolescents partially explains the lack of differences in emotional eating in the current study.

Associations between Stress, Emotional Eating, and Change in Body Mass Index

As predicted, acculturative stress was associated with higher rates of emotional eating in both Latino/a and non-Latino/a adolescents. All remaining domains of stress (i.e., total stress, general stress, process stress, discrimination stress, and perceived stress) were also positively associated with emotional eating. Concurrent with existing literature which suggests that higher stress is associated with increased fatty food consumption and decreased fruit and vegetable intake (Carthwright et al., 2003), stress was also negatively associated with healthy eating patterns in the present study. However, there was no significant association between acculturative stress and change in BMIz in Latino/a adolescents. Normal weight, overweight, and obese Latino/a adolescents reported similar levels of stress across all measures.

It was hypothesized that increased emotional eating would be associated with weight gain over time, but there was no significant association between emotional eating and change in BMIz scores between time one and time two in the present study. Although unexpected, the finding is in line with cross-sectional studies that identified no relationship between emotional eating and weight status (Goldfield et al., 2010; Ledoux et al., 2011; Lluch et al., 2000; Nguyen-Rodriguez et al., 2008; Snoek et al., 2007; Snoek,

Engels, et al., 2013; Snoek, van Strien, et al., 2007; Wardle et al., 1992) and may be due to the short follow-up period (approximately 3 months).

In Latino/a adolescents, there was a non-significant positive association between emotional eating and change in BMIz such that higher rates of emotional eating trended towards increased BMI over time. Multiple previous studies have found a positive association between emotional eating and higher body mass index (Braet, Claus, et al., 2008). For example, Braet and van Strien (1997) found significantly higher emotional eating in obese adolescents and Braet et al. (2008) concluded that overweight adolescents engaged in significantly more emotional eating than their normal-weight counterparts. Such findings are logical in that increased food consumption, specifically consumption of unhealthy foods, contributes to weight gain over time.

Conversely, higher emotional eating was non-significantly associated with decreased weight over time in non-Latino/a adolescents. It has been hypothesized that overweight and obese adolescents engage in less emotional eating due to dieting and efforts to control body weight. Restrained eating is the intentional restriction of food consumption in order to control or reduce body weight and has been associated with higher body mass index (van Strien et al., 2014; Crocker et al., 2003; Lowe et al., 2013; Meule, 2016). However, given the cross-sectional research design, the direction of the association is unclear. It is possible that overweight adolescents are more likely to start dieting and subsequently engage in less emotional eating. Supporting this idea is the fact that the majority of adolescents report dieting; approximately 60 percent of adolescent females and 30 percent of adolescent males report trying to lose weight and actively dieting (National Eating Disorder Association, 2018). Given that overweight adolescents

are more likely to engage in restrained eating, such adolescents in the current study may consequently have reported lower levels of emotional eating than normal weight adolescents.

Moderating Effects of Emotional Eating in Latino/a Adolescents

Based on Barry's Model of Acculturation, it was predicted that emotional eating would serve as a negative coping skill and would moderate the relationship between acculturative stress and health outcomes. No domain of emotional eating affected the relationship between acculturative stress and change in body mass index (BMIz) between time one and time two in Latino/a adolescents and in Latina females. These findings are in contrast to Belcher and colleagues (2011), who found that baseline emotional eating moderated the relationship between baseline worries and follow-up body mass index percentile in Latina adolescent females. Several methodological differences between Belcher and colleagues (2011) and the current study may explain the disparate results.

First, the samples differed between Belcher and colleagues (2011) and the present study. Belcher and colleagues (2011) used a much larger sample size than the current study (i.e., 459 adolescents compared to 168 adolescents in the current study), thus had significantly more power to detect a moderating effect. Additionally, Belcher and colleagues (2011) examined the effects of emotional eating in an exclusively female sample. Multiple studies have demonstrated higher rates of stress, negative emotions, and emotional eating in females than males (Camilleri et al., 2014; Ge, Conger, & Elder, 2001; Farrow & Fox, 2011; Hankin & Abramson, 2001; Wang et al., 2009). Concurrently, female adolescents in the current study reported significantly higher rates of acculturative stress, perceived stress, and emotional eating than male adolescents.

Given that males often report less emotional eating and different patterns of emotional eating (Nguyen-Michel et al., 2008), results likely differed between the present study and Belcher and colleagues (2011) due to the inclusion of male subjects.

Second, Belcher and colleagues (2011) utilized different study measures. Rather than examining change in body mass index between time one and time two, Belcher and colleagues (2011) examined only body mass index percentile at time two. The current study controlled for baseline body mass index and investigated change over time rather than considering weight as a static variable; it is likely that there are greater differences in body mass index percentiles between adolescents than in magnitude of change in body mass index (Lumeng et al., 2010). Additionally, Belcher and colleagues (2011) utilized a measure of general worries and the Dutch Eating Behavior Questionnaire, whereas the current study used a specific measure of acculturative stress and the Emotional Eating Scale for Children and Adolescents. The Dutch Eating Behavior Questionnaire assesses eating in response to fewer emotions than the Emotional Eating Scale and includes no subscale scores, thus has less ability to differentiate between eating in response to frustration, anxiety, and sadness (Tanofsky-Kraff et al., 2007). Further, only general worries, such as worry about the future, friends and family, and health, were assessed in the Belcher and colleagues (2011) study; the present study examined the role of acculturative stress more specifically using the SAFE. It is possible that the broader measures of worry and emotional eating applied to more adolescents and thus led to significant results (Belcher et al., 2011), whereas the current study measures were more specific, less applicable, and less effective at detecting a moderating effect.

Finally, Belcher and colleagues (2011) allowed for more time between time one and time two measurements; follow-up body mass index was measured six months after baseline measurements compared to three months in the current study. It should be noted that data in the current study trended in the same direction as data in Belcher and colleagues' (2011) study; high emotional eaters consistently demonstrated greater gains in body mass index compared to low and average emotional eaters. It is highly likely that changes in body mass index cannot be detected after three months, but may be significant after longer periods of time. Given that the association between emotional eating and weight gain is well established in adults (Fredriks, Van Buuren, Wit & Verloove-Vanhorick, 2000), increased weight due to emotional eating may compound over time.

Additionally, it was hypothesized that Unsettled emotional eating would have a smaller effect on the relationship between acculturative stress and change in body mass index over time. However, Unsettled emotional eating had the largest effect size compared to total, Anger/Anxiety/Frustrated, and Depressed emotional eating. Unsettled emotional eating is comprised of feeling excited, resentful, discouraged, and disobedient and is thought to be associated with eating in response to confusion (Tanofsky-Kraff et al., 2007). The reverse of emotional confusion is emotional awareness, or the ability to accurately recognize and identify different emotions (Rommel et al, 2012). Based on previous literature, emotional awareness mediates the relationship between negative affect and overeating. Specifically, emotional eating has been associated with decreased ability to identify and describe emotions (van Strien, 2006), decreased emotional clarity (Larsen, van Strien, Eisinga, & Engels, 2006), lower attention to emotion (Moon & Berenbaum, 2009), and poor recognition of hunger and satiety cues (Ouwens, van Strien,

van Leeuwe, & van der Staak, 2009; van Strien, 2006). Further, adolescents diagnosed with an eating disorder took significantly longer to describe their emotional state than their same-age counterparts (Sim & Zeman, 2004; Sim & Zeman, 2010). Given that confusion and lack of emotional awareness is associated with overeating, it is logical that the Unsettled subscale of the Emotional Eating Scale played an important role between general stress and body mass index.

Emotional Eating and Eating Patterns

Emotional eating may not unilaterally lead to unhealthy eating or increased body weight. Evidence exists supporting the idea that some emotional eaters increase overall food consumption versus increasing unhealthy food consumption. One study found an association between emotional eating and increased intake in fruits and vegetables in males (Nguyen-Michel et al., 2008), while Braet and van Strien (1997) found positive associations between emotional eating and all types of food. It is possible that adolescents in this study followed a similar pattern and thus did not demonstrate significant increases in body mass index due to emotional eating.

Additionally, some research suggests that higher perceived emotional eating is not consistently associated with increased food consumption. Adriaanse, de Ridder, and Evers (2011) found that reported emotional eating did not predict unhealthy snacking, but rather that strength of snacking habit and restrained eating predicted higher intake of unhealthy snack foods. Habitual snacking is often automatic and the association between emotions and increased food consumption may be unconscious. Conversely, restrained eating, which requires conscious and deliberate effort, was associated with higher perceived emotional eating, but lower food intake. These results suggest that a

preoccupation with food and eating may cause an increase in perceived emotional eating, but may not actually lead to an increase in unhealthy eating or subsequent weight increase (Adriaanse et al., 2011). Several studies have found that Latino/a adolescents were the most likely to perceive themselves as being overweight, to express body dissatisfaction, to report current and chronic dieting attempts, and to endorse binge-eating behavior (Neumark-Sztainer et al., 2002; Story et al., 1995), suggesting a preoccupation with eating behavior and food. Latino/a adolescents in the current study may have endorsed higher levels of perceived emotional eating versus actual consumption of unhealthy foods and subsequent weight gain.

It is also possible that habituation to certain foods weakens the association between emotional eating, unhealthy eating, and weight gain. Food habituation, or the gradual reduction in responding to repeated presentations of the same stimuli, occurs naturally overtime; when presented with the same foods multiple times, the desire to eat and food consumption decreases (Epstein et al., 2009; Holsen et al., 2005). Given that individuals of low socioeconomic status often have decreased variety in their diet, it is possible that adolescents living in poverty are less motivated to eat due to habituation. For example, studies have confirmed that families with low incomes consumed simpler diets in order to cut costs (Drewnowski & Specter, 2004; Widome et al., 2009). Knol et al. (2004) found that children participating in the Supplemental Nutrition Assistance Program, or SNAP, had a significantly less diverse diet than children not enrolled in the program (Knol et al., 2004). Further, families in poverty are often limited to inexpensive, energy-dense foods and have limited access to healthy food options (Coleman- Jensen, Nord, & Singh, 2012; Reyes-Rodríguez et al., 2016; Schlomann, Hesler, Fister, & Taft,

2012; Agne, Daubert, Munoz, Scarinci, & Cherrington, 2012; Lopez-Class & Hosler, 2010). Approximately two-thirds of Latino/a adolescents in the current sample endorsed receiving free or reduced lunch, indicating low levels of socioeconomic status. If adolescents in the current sample are consistently presented with highly palatable, fatty, and salty foods, the desire to consume such options when experiencing negative emotions may be lower. It should also be noted that the percentage of students in the current sample receiving free or reduced lunch is lower than percentage of students receiving free or reduced lunch in the total school populations. It is possible that low socioeconomic status, unhealthy eating, and food habituation is higher in the general population.

Finally, the level of physical activity in the current sample was significantly higher than the national average, likely due to the fact that data was collected in health and physical activity classes. Approximately 28 percent of Latino/a adolescents in the current sample endorsed over 60 minutes of physical activity per day compared to less than 10 percent found in previous studies (Belcher et al., 2010; Trojano et al., 2008). Previous research has demonstrated a moderating effect of physical activity on the relationship between emotional eating and weight gain; emotional eating had significantly less effect on weight gain when participants reported frequent participation in physical activity and sports (Konttinen et al., 2010). Similarly, there appears to be a negative association between emotional eating and both perceived ability to engage in physical activity and actual participation in physical activity (van Strien & Koenders, 2010; Konttinen et al., 2010). Given the high levels of physical activity in the present study, emotional eating may have had less of an effect on body weight status.

Implications of the Current Study

Based on the current study, it appears that Latino/a adolescents are at a higher risk for negative health outcomes, including less healthy eating, lower levels of physical activity, and higher body mass index. In the present study, acculturative stress significantly contributed to higher emotional eating in Latino/a adolescents. Although moderation analyses were non-significant, high Latino/a emotional eaters consistently demonstrated greater weight gain between time one and time two than low and average emotional eaters. It remains unclear if emotional eating serves as a maladaptive coping mechanism or significantly contributes to obesity in adolescents, but it is likely important to educate adolescents on healthy eating patterns and adaptive coping skills to manage stress and weight effectively.

Prevention programs have been shown to be effective in decreasing the development of obesity in children and adolescents (Spear et al., 2007) and school-based prevention programs allow increased access to adolescents (Neumark-Sztainer et al., 2003; Weschler et al., 2000). Findings in the current study suggest a positive association between stress and body mass index in adolescents; prevention programs should not only include education on healthy eating and physical activity, but also on stress management and adaptive coping skills. Previous research suggests that school-based programs targeting stress management effectively decrease worrying, anxiety, and depressive symptoms in adolescents (Kraag et al., 2006; McCraty et al., 1999; Neil & Christensen, 2009; Shochet et al., 2001). Further, acculturative stress should be a focus in prevention programs as the Latino/a population in the United States continues to increase. Empowering Latino/a adolescents to use pre-existing adaptive coping skills, such as

religion, family, and peer support, may improve their ability to cope with acculturative stress without the negative effects of emotional eating or weight gain (Cotton et al., 2006; Crockett et al., 2007; McCraty et al., 1999).

Limitations and Future Directions

Various aspects of the research design limit the results of the current study. The use of self-report measures may be negatively affected by image management, limited introspective ability and understanding, varying interpretations of rating scales, and response bias. No extrinsic rewards were offered for participation, thus participants may not have been motivated to complete measures carefully and accurately. Future research may consider utilizing a controlled laboratory test to ensure measurement of physical levels of emotional eating versus perceived levels and to ensure full effort from participants. Additionally, the current study failed to include a measure of restrained eating, which has been shown to play a significant role in eating behavior. Assessing for multiple domains of eating behavior in future studies would likely clarify the role of food consumption between stress and body mass index.

Body mass index was calculated using participant's height and weight and then converted to percentile ranks based on the CDC Growth Charts. However, body mass index is a surrogate measure of body fatness because it is a measure of excess weight rather than a measure of excess body fat. Higher body mass index may be indicative of more body fat or more fat-free mass. Further, individual characteristics such as muscle, bone mass, and sexual maturation are not considered when calculating body mass index. Additional measures of body composition and body fatness, such as skinfold thickness or

waist circumference measurements, should be incorporated in future research in order to better assess for unhealthy body weight.

Although the current study did examine the change in body mass index over time, initial and follow-up measurements occurred only three months apart. It is highly likely that significant changes in body mass index develop over a longer period of time. Similarly, it may be that negative effects of emotional eating accumulate over time and that large differences in body mass index develop later in life. It has also been suggested that associations between eating behavior and body mass index may be weaker in adolescents than adults due to factors like growth, puberty, menarchal status (Fredriks, Van Buuren, Wit & Verloove-Vanhorick, 2000). Additional research should examine the effects of stress and emotional eating on body mass index over a longer period of time in order to gain a better understanding of the development and direction of the relationship.

The present sample was a relatively large and diverse community sample of adolescents enrolled in public middle or high schools in Central Texas. Data was gathered exclusively in health and physical activity classes, which likely explains the high level of physical activity in the sample. Adolescents enrolled in such classes may not be representative of the general population in that they appear to be more active than the average adolescent. Higher levels of physical activity may serve as an adaptive coping skill and a protective factor against increased body mass index. Future research should include adolescents who engage in a wider range of physical activity per day.

Ultimately, the methodological issues in this study diminish the ability to draw strong conclusions about the effects of emotional eating on the relationship between acculturative stress and change in body mass index. With the aforementioned changes to

the study design, it is possible that future studies may offer insight into the relationship between acculturative stress and weight status, and thereby add vital information to the understanding of the health outcomes in Latino/a adolescents.

APPENDICES

APPENDIX A

School Support Letters



Collins Middle School

1500 Dobbins Road
Corsicana, TX 75110
Principal: Darla Nolen
(903) 872-3979 office
(903) 874-1423 fax

Friday, March 10, 2017

Institutional Review Board (IRB)

Baylor University

One Bear Place #97368

Waco, TX 76798

To Whom It May Concern:

This letter is in regards to the data collection at Collins Middle School for Ms. Stephanie Jernigan's dissertation project entitled "Stress, emotional eating, and obesity: Differences between racial groups in a community sample of adolescents." Ms. Jernigan is a clinical psychology graduate student supervised by Dr. Christine Limbers in the Department of Psychology and Neuroscience at Baylor University.

Ms. Jernigan has communicated with CMS School Nurse, Laurinda Abbe, regarding data collection procedures that will be used during our health and physical education classes at Collins Middle School during the Spring semester of 2017. Parents and/or students participating in the study may receive a copy of the proposed measures for the project. This study is de-identified in that participating students will only complete their names on informed assent forms and study materials will not contain any identifying information (e.g., names or birth dates) and will not be linked in any way to the informed consent or assent forms.

Collins Middle School Nurse, Laurinda Abbe

CISD Health Coordinator, Carla Whitt

Collins Middle School Principal, Darla Nolen

CORSICANA INDEPENDENT SCHOOL DISTRICT



January 30, 2017

Dr. David Schlueter
Institutional Review Board (IRB)
Baylor University
One Bear Place #97368
Waco, TX 76798

Dear Dr. Schlueter,

I am writing this letter to support data collection at Midway Middle School for Ms. Stephanie Jernigan's dissertation project entitled "Stress, emotional eating, and obesity: Differences between racial groups in a community sample of adolescents." I understand that Ms. Jernigan is a clinical psychology graduate student supervised by Dr. Christine Limbers in the Department of Psychology and Neuroscience at Baylor University.

Ms. Jernigan has clearly explained the data collection procedures for the study. I approve for data collection to take place in health and physical education classes at McGregor High School in the Spring and Fall 2017 semesters. I agree to allow Ms. Jernigan and her research assistant to collect data at Midway Middle School. In addition, I have read the proposed measures for the project and approve for them to be given to students participating in the study. This study is de-identified in that students will only complete their names on informed assent forms and study materials will not contain any identifying information (e.g., names of birth dates) and will not be linked in any way to the informed consent and assent forms.

Sincerely,

A handwritten signature in dark ink, appearing to read "H Cox", is written over a light blue horizontal line.

Dr. Herb Cox
Principal
Midway Middle School

Dr. Herb Cox, Principal
Midway Middle School | 800 Hewitt Drive | Waco, Texas 76643 | (254)761-5680

McGregor High School

Robert White
Principal

Stephanie Zamora
Assistant Principal

Seth Fortenberry
Assistant Principal



Dr. David Schlueter
Institutional Review Board (IRB)
Baylor University
One Bear Place #97368
Waco, TX 76798

Dear Dr. Schlueter,

I am writing this letter to support data collection at McGregor High School for Ms. Stephanie Jernigan's dissertation project entitled "Stress, emotional eating, and obesity: Differences between racial groups in a community sample of adolescents." I understand that Ms. Jernigan is a clinical psychology graduate student supervised by Dr. Christine Limbers in the Department of Psychology and Neuroscience at Baylor University.

Ms. Jernigan has clearly explained the data collection procedures for the study. I approve for data collection to take place in health and physical education classes at McGregor High School in the Spring and Fall 2017 semesters. I agree to allow Ms. Jernigan and her two research assistant to collect data in McGregor High School. In addition, I have read the proposed measures for the project and approve for them to be given to students participating in the study. This study is de-identified in that students will only complete their names on informed assent forms and study materials will not contain any identifying information (e.g., names of birth dates) and will not be linked in any way to the informed consent and assent forms.

Sincerely,

Robert White
Principal, McGregor High School

rw

Working together to make success a reality . . .

903 Bluebonnet Pkwy., P. O. Box 356, McGregor, TX 76657
254.840.2853 FAX 254.840.2489
www.mcgregor-isd.org

APPENDIX B

Information, Informed Consent, and Informed Assent Forms



Dear Parents/Guardians and Students,

I hope you are enjoying your spring semester! I am a clinical psychology doctoral student supervised by Dr. Christine Limbers in the Department of Psychology and Neuroscience Baylor University. I am writing to inform you about an opportunity to participate in a dissertation project aimed at understanding how stress impacts eating behaviors and weight. Although the following forms include more information, I wanted to provide a brief overview of the study.

During health and fitness classes, students will be asked to complete questionnaires and have their height and weight measured during a 40-minute time frame. This study is strictly confidential and at no time will a student's name or identifying information be linked to their responses on the questionnaires. Students will only complete their name on the informed assent form.

The informed consent and assent forms are attached with this letter. Students who are willing to participate and parents who agree to allow their adolescent to participate should complete and sign the informed consent and assent forms (two separate forms). Both of these forms should be returned immediately to the health and fitness teachers. I appreciate your willingness to participate.

Sincerely,

Stephanie Jernigan, MSCP
Clinical Psychology
Department of Psychology
and Neuroscience
Baylor University

Christine Limbers, Ph.D.
Doctoral Student Assistant Professor
Department of Psychology
and Neuroscience
Baylor University



Estimados Padres / Guardianes y Estudiantes,

¡Espero que estén disfrutando de su semestre de primavera! Soy una estudiante de doctorado en psicología clínica supervisada por la Dra. Christine Limbers en el Departamento de Psicología y Neurociencia de la Universidad de Baylor. Le escribo para informarle sobre una oportunidad de participar en un proyecto de tesis dirigido a comprender cómo el estrés afecta los comportamientos alimentarios y el peso. Aunque los siguientes formularios incluyen más información, quería proporcionar una breve descripción del estudio.

Durante las clases de salud y acondicionamiento físico, se les pedirá a los estudiantes que completen cuestionarios y que su altura y peso sean medidos durante un período de tiempo de 40 minutos. Este estudio es estrictamente confidencial y en ningún momento el nombre del estudiante o la información de identificación estará vinculada a sus respuestas en los cuestionarios. Los estudiantes sólo completarán su nombre en el formulario de consentimiento informado.

Los formularios de consentimiento informado y asentimiento se adjuntan con esta carta. Los estudiantes que estén dispuestos a participar y los padres que acepten que su adolescente participe deben completar y firmar el consentimiento informado y los formularios de consentimiento (dos formularios separados). Ambas formas deben ser devueltas inmediatamente a los profesores de salud y fitness. ¡Aprecio su disposición a ayudar!

Sinceramente,

Stephanie Jernigan, MSCP
Estudiante de doctorado en psicología clínica
Departamento de Psicología
y Neurociencia
Baylor University

Christine Limbers, Ph.D.
Profesor asistente
Departamento de Psicología
y Neurociencia
Baylor University

Baylor University
Department of Psychology and Neuroscience

Parent/Guardian Permission Form for Research

PROJECT TITLE: Stress, emotional eating, and obesity: Differences between racial groups in a community sample of adolescents

PRINCIPAL INVESTIGATOR: Stephanie Jernigan, MSCP

SUPPORTED BY: Baylor University

Please read this form carefully. The purpose of this form is to provide you with important information about the research study and what to expect if you allow your child to participate. If any of the statements or words in this form are unclear, please let us know. We would be happy to answer any questions. You have the right to discuss this study with another person who is not part of the research team before making your decision whether or not your child can be in the study.

Your child's participation is voluntary. If you decide to let your child take part in this research study, we will ask you to sign this form. We will also ask your child to read and sign an assent form. Your child can refuse to take part even if you provide permission. We will give you a copy of the signed forms. Allowing your child to take part in this study is your choice. You are free not to allow your child to take part or to withdraw your child at any time for any reason. No matter what you decide, there will be no penalty or loss of benefit to which you or your child are entitled. If you decide to withdraw your child from this study, the information that your child has already provided will be kept confidential. You cannot withdraw information collected prior to your child's withdrawal. If your child does not participate, they will be provided with a packet of puzzles as an alternative activity.

The person in charge of this study is Stephanie Jernigan, who is a fourth-year graduate student in the Clinical Psychology doctoral program at Baylor University supervised by Dr. Christine Limbers. We will refer to this person as the "researcher" throughout this form. The purpose of this study is to investigate the relationship between stress, emotional eating, and weight gain in adolescents. Another purpose of this study is to investigate cultural differences in emotional eating. Previous research has found that some cultural groups are at a higher risk for emotional eating and we are interested in learning more about cultural risk factors. We are asking your child to take part in this study because he/she is enrolled in middle or high school. About 400 subjects will take part in this research study. We expect that your child will be in this research study during the Spring 2017 semester. During this time, we will make two visits to your child's classroom during normal school hours.

Visit 1 will take approximately 40 minutes to complete. At this visit, we will ask your child to complete questionnaires about demographic information, stress, diet and exercise, and emotional eating. We will measure your child's height and weight in a private area. Visit 2 will occur approximately 3 months after Visit 1 and will take approximately 20 minutes to complete. At this visit, we will measure your child's height and weight in a private area.

Although there are no identified physical risks, your child may be uncomfortable with some of the questions and topics we will ask about. If this occurs, your child may contact a school guidance counselor during school hours or the Baylor Psychology Clinic (254-710-2470) for services outside of the school setting. Additionally, your child does not have to answer any questions that make him/her feel uncomfortable. Other people may benefit in the future from the information that is learned in this study about the relationship between stress and physical health. There are no costs to you or your child for taking part in this research study.

We will keep the records of this study confidential by storing paper documents behind double-lock security and electronic files on a password protected and encrypted computer. After data collection is complete, all identifying information contained in electronic records will be deleted using computer security software that corrupts the information and protects it from being accessed in the future. We will make every effort to keep your child's records confidential. However, there are times when federal or state law requires the disclosure of your child's records. If, during your child's participation in this study, we have reason to believe that your child is at risk for harming himself/herself or others, we are required to take the necessary actions. This may include notifying your child's doctor, your child's therapist, or other individuals. If this were to occur, we would not be able to assure confidentiality.

The results of this study may also be used for teaching, publications, or presentations at professional meetings. The following people or groups may review your child's study records for purposes such as quality control or safety:

- The Researcher and any member of her research team
- Authorized members of Baylor University who may need to see your child's information, such as administrative staff members from the Office of the Vice Provost for Research and members of the Institutional Review Board (a committee which is responsible for the ethical oversight of the study)
- The sponsor or funding agency for this study
- Federal and state agencies that oversee or review research (such as the HHS Office of Human Research Protection or the Food and Drug Administration)

You can call us with any concerns or questions about the research. Our telephone numbers are listed below:

- Stephanie Jernigan: (254) 710-2470 between 8:00am- 7:00pm
- Dr. Christine Limbers: (254) 710-2470 between 8:00am-7:00pm

If you want to speak with someone **not** directly involved in this research study, you may contact the Baylor University IRB through the Office of the Vice Provost for Research at 254-710-1438. You can talk to them about:

- Your child's rights as a research subject
- Your or your child's concerns about the research
- A complaint about the research

I give my consent for my child to take part in this research study and agree to allow his/her health information to be used and shared as described above.

Signature of Parent/Guardian

Today's Date

Child's Name

Formulario de permiso de los padres / tutores para la investigación

TÍTULO DEL PROYECTO: Estrés, alimentación emocional y obesidad: Diferencias entre grupos raciales en una muestra comunitaria de adolescents

INVESTIGADOR PRINCIPAL: Stephanie Jernigan, MSCP

APOYADO POR: Baylor University

Por favor, lea cuidadosamente este formulario. El propósito de este formulario es proporcionarle información importante sobre el estudio de investigación y qué esperar si usted permite que su hijo participe. Si alguna de las declaraciones o palabras en este formulario no son claras, por favor háganoslo saber. Estaremos encantados de contestar cualquier pregunta. Usted tiene el derecho de discutir este estudio con otra persona que no es parte del equipo de investigación antes de tomar su decisión si su hijo puede participar en el estudio.

La participación de su hijo es voluntaria. Si decide dejar que su hijo participe en este estudio de investigación, le pediremos que firme este formulario. También le pediremos a su hijo que lea y firme un formulario de consentimiento. Su hijo puede negarse a participar incluso si usted le da permiso. Le daremos una copia de los formularios firmados. Permitir que su hijo participe en este estudio es su elección. Usted es libre de no permitir que su hijo participe o de retirar a su hijo en cualquier momento por cualquier razón. No importa lo que decida, no habrá penalidad ni pérdida de beneficio a la que usted o su hijo tenga derecho. Si usted decide retirar a su hijo de este estudio, la información que su hijo ya ha proporcionado será mantenida confidencial. No puede retirar la información recolectada antes del retiro de su hijo. Si su hijo no participa, se le proporcionará un paquete de puzzles como una actividad alternativa.

La persona a cargo de este estudio es Stephanie Jernigan, que es un estudiante de cuarto año de posgrado en el programa de doctorado de Psicología Clínica en la Universidad de Baylor supervisado por la Dra. Christine Limbers. Nos referiremos a esta persona como el "investigador" a lo largo de este formulario. El propósito de este estudio es investigar la relación entre estrés, alimentación emocional y aumento de peso en adolescentes. Otro propósito de este estudio es investigar las diferencias culturales en el comer emocional. La investigación anterior ha encontrado que algunos grupos culturales están en un riesgo más alto para la consumición emocional y estamos interesados en aprender más sobre factores de riesgo culturales. Le estamos pidiendo a su hijo (a) que participe en este estudio porque está matriculado en la escuela media o preparatoria. Alrededor de 400 sujetos participarán en este estudio de investigación. Esperamos que su hijo participe en este estudio de investigación durante el semestre de primavera de 2017. Durante este tiempo, haremos dos visitas al aula de su hijo durante las horas normales de la escuela.

La visita 1 tardará aproximadamente 40 minutos en completarse. En esta visita, le pediremos a su hijo que llene cuestionarios sobre información demográfica, estrés, dieta y ejercicio, y comer emocional. Mediremos la altura y el peso de su niño en un área privada. La Visita 2 ocurrirá aproximadamente 3 meses después de la Visita 1 y tardará aproximadamente 20 minutos en completarse. En esta visita, mediremos la altura y el peso de su niño en un área privada.

Aunque no hay riesgos físicos identificados, su hijo puede sentirse incómodo con algunas de las preguntas y temas que le preguntaremos. Si esto ocurre, su hijo puede comunicarse con un consejero escolar durante las horas escolares o con la Clínica de Psicología de Baylor (254-710-2470) para servicios fuera de la escuela. Además, su hijo no tiene que responder a ninguna pregunta que le haga sentirse incómodo. Otras personas pueden beneficiarse en el futuro de la información que se aprende en este estudio sobre la relación entre el estrés y la salud física. No hay ningún costo para usted o su hijo por participar en este estudio de investigación.

Mantendremos los registros de este estudio confidenciales almacenando documentos en papel detrás de la seguridad de doble cerradura y archivos electrónicos en una computadora protegida con contraseña y encriptada. Una vez completada la recopilación de datos, se eliminará toda la información de identificación contenida en los registros electrónicos utilizando un software de seguridad informática que corrompe la información y la protege de su acceso en el futuro. Haremos todo lo posible para mantener los registros de su hijo confidenciales. Sin embargo, hay momentos en que la ley federal o estatal requiere la divulgación de los registros de su hijo. Si, durante la participación de su hijo en este estudio, tenemos razones para creer que su hijo corre el riesgo de hacerse daño a sí mismo o a otros, estamos obligados a tomar las acciones necesarias. Esto puede incluir notificar al médico de su hijo, al terapeuta de su hijo u otras personas. Si esto ocurriera, no podríamos asegurar la confidencialidad.

Los resultados de este estudio también pueden ser utilizados para la enseñanza, publicaciones o presentaciones en reuniones profesionales. Las siguientes personas o grupos pueden revisar los registros de estudio de su hijo para propósitos tales como control de calidad o seguridad: The Researcher and any member of her research team

- Miembros autorizados de la Universidad de Baylor que tal vez necesiten ver la información de su hijo (a), como miembros del personal administrativo de la Oficina del Vicerrectorado de Investigación y miembros de la Junta de Revisión Institucional (un comité responsable de la supervisión ética del estudio)
- El patrocinador o agencia de financiamiento para este estudio
- Las agencias federales y estatales que supervisan o revisan la investigación (como la Oficina de Protección de la Investigación Humana del HHS o la Administración de Alimentos y Medicamentos)

Puede llamarnos con cualquier inquietud o pregunta acerca de la investigación. Nuestros números de teléfono se enumeran a continuación:

- Stephanie Jernigan: (254) 710-2470 entre 8:00am- 7:00pm

- Dr. Christine Limbers: (254) 710-2470 entre 8:00am-7:00pm

Si desea hablar con alguien que no esté directamente involucrado en este estudio de investigación, puede comunicarse con el IRB de la Universidad de Baylor a través de la Oficina del Vicerrector de Investigación al 254-710-1438. Usted puede hablar con ellos sobre: Your child's rights as a research subject

- Sus inquietudes acerca de la investigación
- Una queja sobre la investigación

Doy mi consentimiento para que mi hijo participe en este estudio de investigación y acepto que su información de salud sea usada y compartida como se describe arriba.

Firma del Padre / Tutor

Fecha

El nombre del niño

Baylor University
Department of Psychology and Neuroscience

Assent Form for Research

PROJECT TITLE: Stress, emotional eating, and obesity: Differences between racial groups in a community sample of adolescents

PRINCIPAL INVESTIGATOR: Stephanie Jernigan, MSCP

SUPPORTED BY: Baylor University

We want to tell you about a research study we are doing. Research studies help us to learn new things and test new ideas. People who work on research studies are called researchers. During research studies, the researchers collect a lot of information so that they can learn more about something. We are doing this study because we would like to learn more about adolescents' eating patterns, especially when they are feeling stressed. We would also like to know if adolescents from different cultural groups eat differently when feeling stressed. We are asking you join this study because you are in middle or high school.

There are a few things you should know about this study:

- You get to decide if you want to be in the study
- You can say 'No' or 'Yes'
- Whatever you decide is OK
- If you say 'Yes' now, you can change your mind and say 'No' later
- No one will be upset if you say 'No'
- You can ask us questions at any time
- We will also get permission from your parent/guardian for you to take part in this study

The person in charge of this study is Stephanie Jernigan and is called the "researcher". We may learn something in study that will help other children feel less stressed and be healthier some day.

If you decide to be in this study, we will ask you to:

- Answer some questions about yourself, your stress levels, and your eating habits
- Have your height and weight measured (in a private area where no one can see you)

During this study, we will come to your classroom two times. This study will last until the end of this school year. The questions might be hard to answer or may upset you. You can skip any questions you do not want to answer. You may get tired during the tasks. You can rest at any time. You do not have to be in this study if you do not want to. If you decide you do not want to be in the study, we will give you a packet of puzzles. It is also ok to say "yes" and change your mind later. You can stop being in the research at any time. If you want to stop, tell the researcher. No one will be mad at you.

You can call us with any concerns or questions about the research. Our telephone numbers are listed below:

- Stephanie Jernigan: (254) 710-2470 between 8:00am- 7:00pm
- Dr. Christine Limbers: (254) 710-2470 between 8:00am-7:00pm

If you have other questions about the study and want to talk to someone who is not a part of the study, you can call the Baylor University IRB through the Office of the Vice Provost for Research at 254-710-1438.

If you want to be in the study, write and sign your name below.

Name of Subject

Signature of Subject

Date

I have explained the research to the subject and answered all his/her questions. I will give a copy of the signed consent forms to the subject and his/her parent/guardian.

Signature of Person Obtaining Consent

Date

Formulario de Asentimiento para la Investigación

TÍTULO DEL PROYECTO: Estrés, alimentación emocional y obesidad: Diferencias entre grupos raciales en una muestra comunitaria de adolescents

INVESTIGADOR PRINCIPAL: Stephanie Jernigan, MSCP

APOYADO POR: Baylor University

Queremos hablarles de un estudio de investigación que estamos haciendo. Los estudios de investigación nos ayudan a aprender cosas nuevas y a probar nuevas ideas. Las personas que trabajan en estudios de investigación se llaman investigadores. Durante los estudios de investigación, los investigadores recogen una gran cantidad de información para que puedan aprender más sobre algo. Estamos haciendo este estudio porque nos gustaría aprender más sobre los patrones de alimentación de los adolescentes, especialmente cuando se sienten estresados. También nos gustaría saber si los adolescentes de diferentes grupos culturales comen de manera diferente cuando se sienten estresados. Le estamos pidiendo que se una a este estudio porque está en la escuela media o preparatoria.

Hay algunas cosas que usted debe saber acerca de este estudio:

- Tienes que decidir si quieres estar en el estudio
- Puede decir 'No' o 'Sí'
- Lo que decidas está bien
- Si dices 'Sí' ahora, puedes cambiar de opinión y decir 'No' más tarde
- Nadie se disgustará si dice 'No'
- Puede hacernos preguntas en cualquier momento
- También obtendremos el permiso de su padre / tutor para que participe en este estudio

La persona a cargo de este estudio es Stephanie Jernigan y se llama el "investigador". Podemos aprender algo en el estudio que ayudará a otros niños a sentirse menos estresados y ser más saludable algún día.

Si decide participar en este estudio, le pediremos que:

- Responda algunas preguntas sobre usted, sus niveles de estrés y sus hábitos alimenticios
- Tenga su altura y peso medidos (en un área privada donde nadie puede verlo)

Durante este estudio, llegaremos a su aula dos veces. Este estudio durará hasta el final de este año escolar. Las preguntas pueden ser difíciles de responder o pueden molestarle. Puede omitir cualquier pregunta que no quiera responder. Usted puede

cansarse durante las tareas. Puede descansar en cualquier momento. No tienes que estar en este estudio si no quieres. Si decides que no quieres estar en el estudio, te daremos un paquete de puzzles. También está bien decir "sí" y cambiar de opinión más tarde. Usted puede dejar de estar en la investigación en cualquier momento. Si quiere detenerse, dígale al investigador. Nadie estará enojado contigo.

Puede llamarnos con cualquier inquietud o pregunta acerca de la investigación. Nuestros números de teléfono se enumeran a continuación:

- Stephanie Jernigan: (254) 710-2470 entre 8:00am- 7:00pm
- Dr. Christine Limbers: (254) 710-2470 entre 8:00am- 7:00pm

Si tiene otras preguntas sobre el estudio y desea hablar con alguien que no es parte del estudio, puede llamar a la IRB de la Universidad de Baylor a través de la Oficina del Viceprovincial de Investigación al 254-710-1438.

Si desea participar en el estudio, escribe y firma tu nombre.

Nombre del sujeto

Firma del sujeto

Fecha

He explicado la investigación al tema y he respondido a todas sus preguntas. Daré una copia del formulario de consentimiento firmado al sujeto y su padre / guardián.

Firma de la persona que obtiene permiso

Fecha

APPENDIX C

Study Measures

Demographic Information (English)

What is your name? _____

What is your age? _____

What is your gender? ____Boy ____Girl

What is your race/ethnicity? ____White ____Black ____Latino/a
____Asian ____Other

Were you born in the United States? ____Yes ____No

Were your parents born in the United States? ____Yes ____No

Were you grandparents born in the United States? ____Yes ____No

What is the highest education attained by your mother or father?

- ____Some high school or less
- ____High School diploma or GED
- ____Vocational School or some college
- ____College degree
- ____Professional or graduate degree

Do you receive free or reduced school lunches? ____Yes ____No

How many minutes each day do you engage in physical activity? Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, playing with friends, or walking to school. Some examples of physical activity are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football, and surfing.

- ____0
- ____1-15
- ____15-30
- ____30-45
- ____45-60
- ____More than 60

Datos Demográficos (Español)

¿Cuál es su nombre? _____

¿Cuántos años tienes? _____

¿Cuál es su género? ____Chico ____Chica

¿Cuál es tu etnia? ____Caucásico/a ____Afroamericano/a ____Latino/a
____Asiático/a ____Otro/a

¿Naciste en los Estados Unidos? ____Sí ____No

¿Sus padres nacieron en los Estados Unidos? ____Sí ____No

¿Eran abuelos nacidos en los Estados Unidos? ____Sí ____No

¿Cuál es la educación más alta alcanzada por su madre o padre

- ____Alguna escuela secundaria o menos
- ____Diseño de escuela secundaria o GED
- ____Escuela de Administración o alguna universidad
- ____Título universitario
- ____Título profesional o de posgrado

¿Recibe almuerzos gratuitos o reducidos en la escuela? ____Sí ____No

¿Cuántos minutos cada día dedica a la actividad física? La actividad física es una actividad que aumenta su ritmo cardíaco y le hace salir de aliento alguna parte del tiempo. La actividad física se puede hacer en deportes, jugando con amigos, o caminando a la escuela. Algunos ejemplos de actividad física están corriendo, caminar enérgico, patinar, andar en bicicleta, bailar, andar en monopatín, nadar, fútbol, baloncesto, fútbol y surf.

- ____0
- ____1-15
- ____15-30
- ____30-45
- ____45-60
- ____Mas que 60

Emotional Eating Scale for Children and Adolescents (English)

| EXAMPLE | | | | | | |
|-------------------------|-------------------------|------------------------------|---------------------------------|-------------------------------|------------------------------------|---|
| When I feel this way... | I have no desire to eat | I have a small desire to eat | I have a moderate desire to eat | I have a strong desire to eat | I have a very strong desire to eat | <i>On average, how many days a week do you eat because you feel this way? (0-7)</i> |
| Starving | | | | | X | 3 |
| When I feel this way... | I have no desire to eat | I have a small desire to eat | I have a moderate desire to eat | I have a strong desire to eat | I have a very strong desire to eat | <i>On average, how many days a week do you eat because you feel this way? (0-7)</i> |
| Resentful | | | | | | |
| Discouraged | | | | | | |
| Shaky | | | | | | |
| Worn Out | | | | | | |
| Not doing enough | | | | | | |
| Excited/ | | | | | | |
| Disobedient | | | | | | |
| Down | | | | | | |
| Stressed out | | | | | | |
| Sad | | | | | | |
| Uneasy | | | | | | |
| Irritated | | | | | | |
| Jealous | | | | | | |
| Worried | | | | | | |
| Frustrated | | | | | | |
| Lonely | | | | | | |
| Furious | | | | | | |
| On edge | | | | | | |
| Confused | | | | | | |
| Nervous | | | | | | |
| Angry | | | | | | |
| Guilty | | | | | | |
| Bored | | | | | | |
| Helpless | | | | | | |
| Upset | | | | | | |
| Happy | | | | | | |

Emotional Eating Scale for Children and Adolescents (Español)

| EJEMPLO | | | | | | |
|------------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|-------------------------------------|---|
| Cuando me siento de esta manera... | No tengo ningún deseo de comer | Tengo un pequeño deseo de comer | Tengo un deseo moderado a comer | Tengo un fuerte deseo de comer | Tengo una muy fuerte deseo de comer | <i>El número de días en una semana come cuando se siente de esta manera (0-7)</i> |
| Hambriento | | | | | X | 3 |
| Cuando me siento de esta manera... | No tengo ningún deseo de comer | Tengo un pequeño deseo de comer | Tengo un deseo moderado a comer | Tengo un fuerte deseo de comer | Tengo una muy fuerte deseo de comer | <i>El número de días en una semana come cuando se siente de esta manera (0-7)</i> |
| Resentido/a | | | | | | |
| Desanimado/a | | | | | | |
| Tembloroso/a | | | | | | |
| Rendido/a | | | | | | |
| No haciendo lo suficiente | | | | | | |
| Ansioso/a | | | | | | |
| Desobediente | | | | | | |
| Decaído/a) | | | | | | |
| Inquieta | | | | | | |
| Triste | | | | | | |
| Estresado/a | | | | | | |
| Irritado/a | | | | | | |
| Celoso/a | | | | | | |
| Preocupado/a | | | | | | |
| Frustrado/a | | | | | | |
| Solo/a | | | | | | |
| Furioso/a | | | | | | |
| Al Límite | | | | | | |
| Confuso/a | | | | | | |
| Nervioso/a | | | | | | |
| Enfadado/a | | | | | | |
| Culpable | | | | | | |
| Aburrido/a | | | | | | |
| Impotente | | | | | | |
| Alterado/a | | | | | | |
| Alegre | | | | | | |

Perceived Stress Scale (English)

Instructions: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate with an X how often you felt or thought a certain way.

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 felt confident about your ability to handle your personal problems?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

5. 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

6. In the last month, how often have you 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

7. 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

8. 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

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

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

10. 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

Perceived Stress Scale (Español)

Instrucciones: Las preguntas que siguen son sobre sus sentimientos y pensamientos durante los últimos ochodías. Para cada pregunta, por favor dígame con X se sintió de esa manera.

1. Se sintió que no podía controlar las cosas importante en su vida?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

2. Se sintió nerviosa o llena de tensión?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

3. Se sintió que manejo bien los cambios importante ocurridos durante esos días?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

4. Sintió confianza en poder manejar sus problemas personales?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

5. Se sintió que las cosas le estaban llendo bien o mejor que otras veces?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

6. Tuvó problemas en manejar todas las cosas que tenía que hacer durante esos días?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

7. Ha podido controlar sus enojos?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

8. Se enojó por cosas que no pudo controlar?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

9. Ha utilizado su tiempo adecuadamente?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

10. Ha sentido que tenía tantas dificultades que no podía solucionarlas?

___0=nunca ___1=casi nunca ___2=de vez en cuando ___3=frecuentemente
___4=casi siempre

Adolescent Food Habits Checklist (English)

1. If I am having lunch away from home, I often choose a low-fat option.

☐ True ☐ False ☐ I never have lunch away from home

2. I usually avoid eating fried foods.

☐ True ☐ False

3. I usually eat a dessert or pudding if there is one available.

☐ True ☐ False

4. I make sure I eat at least one serving of fruit a day.

☐ True ☐ False

5. I try to keep my overall fat intake down.

☐ True ☐ False

6. If I am buying potato chips, I often choose a low-fat brand.

☐ True ☐ False ☐ I never buy potato chips

7. I avoid eating lots of sausages and burgers.

☐ True ☐ False ☐ I never eat sausages or burgers

8. I often buy pastries or cakes.

☐ True ☐ False

9. I try to keep my overall sugar intake down.

☐ True ☐ False

10. I make sure I eat at least one serving of vegetables or salad a day.

☐ True ☐ False

11. If I am having a dessert at home, I try to have something low in fat.

☐ True ☐ False ☐ I don't eat desserts

12. I rarely eat takeaway meals.

☐ True ☐ False

13. I try to ensure I eat plenty of fruit and vegetables.

☐ True ☐ False

14. I often eat sweet snacks between meals.

☐ True ☐ False

15. I usually eat at least one serving of vegetables (excluding potatoes) or salad with my evening meal.

☐ True ☐ False

16. When I am buying a soft drink, I usually choose a diet drink.

☐ True ☐ False ☐ I never buy soft drinks

17. When I put butter or margarine on bread, I usually spread it thinly.

☐ True ☐ False ☐ I never have butter or margarine on bread

18. If I have a packed lunch, I usually include some chocolate and/or biscuits.

☐ True ☐ False ☐ I never have a packed lunch

19. When I have a snack between meals, I often choose fruit.

☐ True ☐ False ☐ I never eat snacks between meals

20. If I am having a dessert or pudding in a restaurant, I usually choose the healthiest one.

☐ True ☐ False ☐ I never have desserts in restaurants

21. I often have cream on desserts.

☐ True ☐ False ☐ I don't eat desserts

22. I eat at least three servings of fruit most days.

☐ True ☐ False

23. I generally try to have a healthy diet.

☐ True ☐ False

Lista de verificación de hábitos alimentarios para adolescents (Español)

- 1. Cuando almuerzo fuera de casa, a menudo elijo una opción baja en grasa.**
☐ Cierto ☐ Falso ☐ Nunca almuerzo fuera de casa
- 2. Evito comer alimentos fritos.**
☐ Cierto ☐ Falso
- 3. Cuando el postre o pudín está disponible, por lo general lo come**
☐ Cierto ☐ Falso
- 4. Me aseguro de comer frutas crudos o cocidos al menos, una vez al día.**
☐ Cierto ☐ Falso
- 5. Trato de comer poca grasa.**
☐ Cierto ☐ Falso
- 6. Cuando compro las patatas fritas, compro las patatas fritas de bajo contenido de grasa.**
☐ Cierto ☐ Falso ☐ Nunca compro patatas fritas
- 7. Evito comer mortadela, jamón de cochino, salchichas y cualquier otro alimento de charcutería.**
☐ Cierto ☐ Falso ☐ Nunca como esos alimentos
- 8. Evito comprar tortas o chucherías (caramelos, chicles, galletas, chupetas, etc.)**
☐ Cierto ☐ Falso
- 9. Trato de comer poco de azúcar.**
☐ Cierto ☐ Falso
- 10. Me aseguro de comer vegetales crudos o cocidos al menos, una vez al día.**
☐ Cierto ☐ Falso
- 11. Cuando como postre, como algo bajo en grasa.**
☐ Cierto ☐ Falso ☐ Nunca como postres
- 12. Evito comer en restaurantes de comida rápida**
☐ Cierto ☐ Falso
- 13. Trato de comer bastantes vegetales y frutas en un un día.**
☐ Cierto ☐ Falso
- 14. Cuando hago merienda, evito comer chocolate, galletas, tortas, caramelos o cualquier otra chuchería**
☐ Cierto ☐ Falso

- 15. Me aseguro de comer verduras con la cena.**
☐ Cierto ☐ Falso
- 16. Cuando compro un refresco escojo uno light o de dieta.**
☐ Cierto ☐ Falso ☐ Nunca compro un refresco
- 17. Cuando le coloco mantequilla o margarina a la arepa o al pan, evito ponerles en exceso.**
☐ Cierto ☐ Falso ☐ Nunca puse mantequilla o margarina a la arepa o al pan
- 18. Cuando tomo mi almuerzo a la escuela, tomo un postre**
☐ Cierto ☐ Falso ☐ Nunca llevo mi almuerzo a la escuela
- 19. Cuando hago meriendas, como frutas.**
☐ Cierto ☐ Falso ☐ Nunca hago meriendas
- 20. Cuando como postres, escojo los que son bajos en grasas, tales como: gelatina, dulce de frutas, helados light o de dieta.**
☐ Cierto ☐ Falso ☐ Nunca como postres
- 21. Evito, ponerle a los helados: leche condensada, miel, pepitas de chocolate, u otros aditivos dulces.**
☐ Cierto ☐ Falso ☐ Nunca como postres
- 22. Trato de comer, al menos, tres raciones de frutas al día.**
☐ Cierto ☐ Falso
- 23. Normalmente trato de comer alimentos saludables.**
☐ Cierto ☐ Falso

Social, Attitudinal, Familial, and Environmental (SAFE)

Acculturation Stress Scale (English)

Circle the answer that shows what bothers you. There is no wrong answer.

| | Doesn't Apply | Doesn't Bother me | Almost Never Bothers me | Sometimes Bothers me | Often Bothers me | Bothers me a lot |
|--|------------------|----------------------|----------------------------|-------------------------|---------------------|---------------------|
| Example: I worry I will not finish my homework. | 0 | 1 | 2 | 3 | 4 | 5 |
| 1. I feel bad when others make jokes about people who are in the same group as me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. It's hard for me to talk to new kids. | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. I have more things that get in my way than most people do. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. It bothers me that people in my family who I am close to don't understand the things that I think are important, that are new to them. | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. People in my family who I am close to have plans for me when I grow up that I don't like. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. It bothers me that when something in my family is very one side. | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. It bothers me when my parents argue. | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. It's hard for me to tell my friend how I really feel. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. I don't have any close friends. | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. It's hard for me to ask questions in class. | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. I worry about what other kids think about me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. Many people believe certain things about the way people in my group act, think, or are, and they treat me as if those things are true. | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. I worry about having to take tests in school. | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. I don't feel at home here in the United States. | 0 | 1 | 2 | 3 | 4 | 5 |
| 15. People think I am shy, when I really just have trouble speaking English. | 0 | 1 | 2 | 3 | 4 | 5 |
| 16. I worry about being sick. | 0 | 1 | 2 | 3 | 4 | 5 |
| 17. The thought of my family and I moving to a new place bothers me. | 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18. I often feel that people purposely try to stop me from getting better at something. | 0 | 1 | 2 | 3 | 4 | 5 |
| 19. I worry that other kids won't like me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 20. It bothers me when people force me to be like everyone else. | 0 | 1 | 2 | 3 | 4 | 5 |
| 21. I worry that other kids are making fun of me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 22. I often feel like people who are supposed to help me are not really paying attention to me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 23. It bothers me when I am not with my family. | 0 | 1 | 2 | 3 | 4 | 5 |
| 24. Because of the group I am in, I don't get the grades I deserve. | 0 | 1 | 2 | 3 | 4 | 5 |
| 25. It bothers me when I argue with my brother/sister. | 0 | 1 | 2 | 3 | 4 | 5 |
| 26. I worry about getting my report card. | 0 | 1 | 2 | 3 | 4 | 5 |
| 27. It bothers me that I have an accent. | 0 | 1 | 2 | 3 | 4 | 5 |
| 28. It's hard to be away from the country I used to live in. | 0 | 1 | 2 | 3 | 4 | 5 |
| 29. I think a lot about my group and its culture. | 0 | 1 | 2 | 3 | 4 | 5 |
| 30. It bothers me when some countries of the world don't get along. | 0 | 1 | 2 | 3 | 4 | 5 |
| 31. It's hard to talk with my teacher. | 0 | 1 | 2 | 3 | 4 | 5 |
| 32. Because of the group I am in, I feel others don't include me in some of the things they do, games they play, etc. | 0 | 1 | 2 | 3 | 4 | 5 |
| 33. It's hard for me to "show off:" my family. | 0 | 1 | 2 | 3 | 4 | 5 |
| 34. People think badly of me if I practice customs or I do the "special things" of my group. | 0 | 1 | 2 | 3 | 4 | 5 |
| 35. I have a hard time understand what others say when they speak. | 0 | 1 | 2 | 3 | 4 | 5 |
| 36. I worry about having enough money. | 0 | 1 | 2 | 3 | 4 | 5 |

Social, Attitudinal, Familial, and Environmental (SAFE)**Acculturation Stress Scale (Español)**

Ponle círculo al número que demuestra que tanto te molesta cada oración. No hay respuestas incorrectas.

| | No aplica | No me molesta | Casi nunca me molesta | A veces me molesta | A menudo me molesta | Me molesta mucho |
|--|-----------|---------------|-----------------------|--------------------|---------------------|------------------|
| 0. EJEMPLO: Me preocupa no terminar mi tarea. | 0 | 1 | 2 | 3 | 4 | 5 |
| 1. Me siento mal cuando otros hacen bromas acerca de las personas Latinas/Mexicanas. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. Es difícil para mí hablar con los niños que no conozco. | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. Tengo más cosas que se interponen en mi camino que la mayoría de la gente. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. Me molesta que mi familia no entiende las cosas que son importantes para mí si es que son nuevas para ellos. | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. Mi familia tiene planes para cuando sea grande que no me gustan. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. Me molesta cuando alguien de mi familia está muy enfermo. | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. Me molesta cuando mis padres discuten. | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. Es difícil para mí decirles a mis amigos cómo me siento. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. Yo no tengo amigos cercanos. | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. Es difícil para mí hacer preguntas en clase. | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. Me preocupa lo que los otros niños piensan de mí. | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. Mucha gente cree ciertas cosas sobre la manera en que los Latinos actúan, piensan, o son, y ellos me tratan como si esas cosas fueran ciertas. | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. Me preocupa tener que tomar los exámenes en la escuela. | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. No me siento en casa aquí en los Estados Unidos. | 0 | 1 | 2 | 3 | 4 | 5 |
| 15. La gente piensa que soy tímido, cuando en realidad sólo batallo hablar en inglés. | 0 | 1 | 2 | 3 | 4 | 5 |
| 16. Me preocupa enfermarme. | 0 | 1 | 2 | 3 | 4 | 5 |
| 17. Me molesta la idea de que mi familia y yo nos tengamos que | 0 | 1 | 2 | 3 | 4 | 5 |

mudar a otro lugar.

| | | | | | | |
|---|---|---|---|---|---|---|
| 18. A menudo siento que la gente deliberadamente trata de impedirme que me mejore en algo. | 0 | 1 | 2 | 3 | 4 | 5 |
| 19. Me preocupa que yo no les caiga bien a otros niños. | 0 | 1 | 2 | 3 | 4 | 5 |
| 20. Me molesta cuando la gente me obliga a ser como los demás. | 0 | 1 | 2 | 3 | 4 | 5 |
| 21. Me preocupa que otros niños se burlan de mí. | 0 | 1 | 2 | 3 | 4 | 5 |
| 22. A menudo siento que la gente que se supone que debería ayudarme no me pone ninguna atención. | 0 | 1 | 2 | 3 | 4 | 5 |
| 23. Me molesta cuando no estoy con mi familia. | 0 | 1 | 2 | 3 | 4 | 5 |
| 24. Debido a ser Latino, no saco las calificaciones que me merezco. | 0 | 1 | 2 | 3 | 4 | 5 |
| 25. Me molesta cuando discuto con mi hermano / hermana. | 0 | 1 | 2 | 3 | 4 | 5 |
| 26. Me preocupa mi boleta de calificaciones. | 0 | 1 | 2 | 3 | 4 | 5 |
| 27. Me molesta que tengo un acento. | 0 | 1 | 2 | 3 | 4 | 5 |
| 28. Es duro estar lejos del país donde vivía antes. | 0 | 1 | 2 | 3 | 4 | 5 |
| 29. Pienso mucho en mi grupo y su cultura. | 0 | 1 | 2 | 3 | 4 | 5 |
| 30. Me molesta cuando algunos países del mundo no se llevan bien. | 0 | 1 | 2 | 3 | 4 | 5 |
| 31. Es difícil hablar con mi maestro/a. | 0 | 1 | 2 | 3 | 4 | 5 |
| 32. Debido a ser Latino, siento que los demás no me incluyen en algunas de las cosas que hacen, como sus juegos, etc. | 0 | 1 | 2 | 3 | 4 | 5 |
| 33. Es difícil para mí "demostrar" a mi familia. | 0 | 1 | 2 | 3 | 4 | 5 |
| 34. La gente piensa mal de mí cuando hago las costumbres o cosas especiales de mi grupo. | 0 | 1 | 2 | 3 | 4 | 5 |
| 35. Batallo comprender lo que otros dicen cuando hablan. | 0 | 1 | 2 | 3 | 4 | 5 |
| 36. Me preocupa tener suficiente dinero. | 0 | 1 | 2 | 3 | 4 | 5 |

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