SOCIOECONOMIC STATUS, ACCULTURATION, FAMILY CHARACTERISTICS, AND HEALTH BEHAVIORS: TESTING THE RESERVE CAPACITY MODELWITH HISPANIC ADOLESCENTS

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ABSTRACT

Research shows that socioeconomic status (SES) can impact adolescent use of alcohol and smoking. These relationships may be mediated by stress, psychosocial reserves, and negative emotions. I explored these relationships using the Reserve Capacity Model (RCM) as a theoretical foundation. The RCM suggests that individuals of low social status experience stress and must tap into tangible, intrapersonal, and interpersonal resources, often leaving these reserves depleted. Low reserves, in turn, predict the experience of negative emotions which can result in poor health outcomes. The RCM was later revised to integrate cultural constructs that can serve as stressors and resources (e.g., familism, which prioritizes the role of the family as a supportive network). The purpose of this study was to test the RCM using culturally relevant variables as mediators of relationships between SES, alcohol use, and smoking in a sample of Hispanic American adolescents. I predicted that low SES would positively predict stress (e.g., perceived discrimination and acculturative stress).

Stress, then, would be negatively related to reserve capacity (i.e., familism, family cohesion, and fatalism), which, in turn, would negatively predict symptoms of depression. Then, depressive symptoms would be positively related to alcohol use and smoking. A sample of 1,386 Hispanic American adolescents completed self-report measures of these constructs across three school years. Counter to my hypotheses, baseline SES was unrelated to smoking and alcohol use at year three (controlling for baseline levels). Mediation hypotheses were partially supported. Results showed baseline SES predicted increased levels of perceived discrimination at year two, which, in turn, was significantly related to decreased familism and family cohesion also at year two. Family cohesion was significantly related to symptoms of depression at year two, which, in turn, predicted increased use of alcohol and smoking behaviors at year three. Findings suggest that low SES is associated with perceived discrimination, which negatively affects family functioning. In turn, challenges in the family seem to affect distress symptoms, which, in turn, predict alcohol use and smoking. Results imply that interventions designed to address adolescent perceptions of discrimination, or family cohesion, may positively impact rates of smoking and alcohol use among adolescents.

APPROVAL PAGE

The faculty listed below, appointed by the Dean of the College of Arts and Sciences have examined a dissertation titled "Socioeconomic Status, Acculturation, Family Characteristics, and Health Behaviors: Testing the Reserve Capacity Model with Hispanic Adolescents," presented by Alisha D. Howarter, candidate for the Doctor of Philosophy degree, and certify that in their opinion it is worthy of acceptance.

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I am constantly amazed by the number of people who have offered me support during the past six years. I would like to dedicate this dissertation to those people. Primarily, I dedicate this project to my husband, David Howarter. My husband has been my cheerleader and my coach over the past several years. He has kept me positive during points of frustration, and pushed me to see my goals to fruition, no matter the sacrifices we have had to endure. I feel so lucky to have you in my corner, and I believe that you have earned this degree right beside me.

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CHAPTER 1

INTRODUCTION

Health disparities have existed across racial groups in the United States for centuries, with minorities having higher rates of mortality and chronic disease infections than European Americans (National Center for Health Statistics, 2007). The root causes for these disparities have been best explained by disparities in socioeconomic status (SES) and the experience of stressful life circumstances. According to the 2010 Census, there are approximately 50.5 million Hispanic Americans living in the United States (US), accounting for over 16% of the country's population (Ennis, Ríos-Vargas, & Albert, 2011). Hispanic Americans are the youngest demographic group in the US, with youth ages 15 – 19 accounting for 8.3% of the entire Hispanic population, compared to 6.4% of European Americans within the same age category (Pew Hispanic Center, 2011). Thus, it is important to understand this population and the challenges these individuals face.

Adolescence is a time of change and adaptation prior to adulthood. During this time, individuals begin to assume responsibility for personal choices and behaviors, such as exercise, sexual activity, driving, and substance use (Mulye et al., 2009). Adolescent health behaviors have been shown to be significant predictors of future adult health (Kelder, Perry, Klepp, & Lytle, 1994). In a related vein, SES during youth has been shown to predict adult health status and functionality. Multiple studies (e.g., Case, Fertig, & Paxson, 2005; Haas, 2008) have found that childhood SES and health conditions are significantly related to adult SES and health conditions. These studies suggest that there is a trajectory, set in childhood,

which is predictive of adult SES, health behaviors, and health outcomes. While this relationship exists for all ethnic groups in the US, minorities face higher levels of childhood poverty and poor health conditions (Adler & Rehkopf, 2008), which suggests that this information must be evaluated and understood through the lens of cultural variables in addition to race and SES.

Cultural variables can be either protective or additional forms of stress. In order to understand how variables such as culture and SES interact and lead to poor health behaviors for Hispanic American adolescents, more research demonstrating their connections is needed. For example, Hispanic American adolescents, in particular, face additional life stressors unique to their race, such as discrimination, acculturation, and maintenance of traditional cultural values (Berkel et al., 2010). In 2003, Gallo and Matthews proposed a theoretical model, titled the Reserve Capacity Model (RCM), that can be used to understand the relationships between SES and poor health outcomes. Gallo and Matthews explained that individuals with low SES face greater levels of stress. This model posits that to handle stressful events, individuals turn to their "reserves," which include tangible resources (e.g., money, transportation), interpersonal resources (e.g., social support), and intrapersonal resources (e.g., self-esteem, optimism). In addition to low interpersonal and intrapersonal reserves, when a person is of low SES, they inherently have lower tangible resources.

Minorities in the US are exposed to unequal and unfair treatment based on race (Williams, 1999). This experience results in an increased activation of the sympathetic nervous system, equal to the response of stressors such as those experienced during stressful social interactions, trauma, or major life events (Mays, Cochran, & Barnes, 2007). The RCM suggests that people of low SES tap into their reserves often, and have little time to replenish

them once used. The RCM also suggests that low reserves and stress elicit negative emotions, such as depression and anxiety, which in turn, affect what Gallo and Matthews term "intermediate pathways." Intermediate pathways include things such as health behaviors (e.g., use of tobacco), development of obesity, and how an individual's immune system responds to infections. Thus, intermediate pathways represent the final link in the connection of social and psychological processes that lead to poor health outcomes, such as all-cause mortality (Gallo & Matthews, 2003).

In 2009, Gallo and colleagues revised the RCM to include culturally relevant variables, such as acculturative stress, familism, and discrimination (Figure 1). These were important additions, because effects of stress, such as in the process of acculturation, can cause a depletion of an individual's interpersonal and intrapersonal resources. This results in negative emotions, such as anger, hostility, depression, and anxiety. In turn, the culturally-relevant RCM suggests that negative emotions are associated with intermediate pathways, which ultimately negatively affect physical health outcomes over time. The current project focused on one intermediate pathway: engagement in health-promoting behaviors.

In this project, I evaluated the revised, culturally-relevant RCM using longitudinal data of Hispanic American adolescents. Using an existing, 4-year, longitudinal study, I conducted a secondary analysis of the first three years of collected data to test the revised RCM. Self-report data used in this study were collected from over 3,000 students, of which 1,564 met inclusion criteria (i.e., being of Hispanic ethnicity, completing all three waves of data, etc.), and 1,386 had sufficient data for statistical analyses. In one model, I used SES at year one to predict stress (operationalized as perceived discrimination), reserves (operationalized as familism, family cohesion, and fatalism), and negative emotions

(operationalized as symptoms of depression) at year two, and to predict health behaviors at year three (controlling for baseline levels). Health behaviors of interest included smoking and alcohol use, as these are related to the development of chronic health conditions across the lifespan (e.g., Fiore et al., 2008). Results showed that the relationship between SES and health behaviors (smoking and alcohol use) was partially mediated by perceived discrimination, familism, family cohesion, and symptoms of depression.

In another model, I used a measure of acculturation collected at baseline, and controlled for baseline SES. I used two measures of stress (i.e., perceived discrimination and acculturative stress) at year two, along with the same measures of reserves, negative emotions, and health behaviors. Although I hypothesized that several pathways would vary for males and females, results showed acculturation was unrelated to the outcome variables, perceived discrimination, and acculturative stress. Thus, it was not possible to calculate a mediated model, and differences by sex were not tested.

CHAPTER 2

REVIEW OF THE LITERATURE

SES, Stress, and Health

Socioeconomic status (SES) is a form of social classification across all major societies (Oakes, & Rossi, 2003). This construct includes having control over material wealth and tangible resources, as well as a person's education, employment, and social prestige (Hackman, & Farah, 2008). According to research published with the Pew Hispanic Center (Motel, 2012), the percentage of Hispanic American adults with less than a high school education is 37.7%, compared to 9.3% of European Americans. This same research group reports that 24.7% of all Hispanic Americans live at an income level below the Federal Poverty line, compared to 10.6% of European Americans. When specifically looking at adolescents, 32.4% of Hispanic American adolescents are supported by a family income that is below the Federal Poverty line, compared to 13.2% of European American adolescents. Hispanic high school students living in poverty are more likely than European American high school students to attend schools with lower achievement standards and schools with lower rates of graduation (Thomas & Crouse Quinn, 2008).

A variety of researchers have demonstrated a link between low SES and poor health outcomes, including increased morbidity and mortality (George, 2005; Lynch, Smith, Kaplan, Shema, 1997; Williams, & Rucker, 1996). For example, being of low SES increases the likelihood of a child developing asthma, which can increase morbidity and mortality among children (Flores et al., 2009). These health disparities by SES are likely to occur for a

number of reasons. First, individuals living in poverty are likely to have lower levels of education, which, in turn, can impact health through poor disease-management skills and lack of access to healthcare. Additionally, lower levels of education can lead to poor health literacy, poor comprehension of medication regimens, reduced patient-provider communication, and ultimately can hinder an individual's ability to care for his or her own health (Goldman & Smith, 2002). Lower income levels also require people to work longer hours, in more dangerous conditions, and until later in life (Smith, 2004) when compared to people who do not live in poverty. Poor living conditions found in impoverished neighborhoods can have a more direct impact on health via exposure to toxins, water contamination (Olden & White, 2005), inadequate heating, and the potential to be a victim of a crime (Williams, 1999). The CDC (2011a) reports that Hispanic American adolescents and adults are two times more likely than European Americans to live in inadequate housing, which is defined to include housing that has moderately or severely insufficient heating, exposed electric wiring, having lead-based paint, lack of a working toilet, or lack of running hot or cold water.

Furthermore, when considering the social gradient, we find that engagement in health-promoting behaviors is highest for those of the highest SES. This helps explain the association between poverty and poor health. For example, a study by Burgess, Ding, Hargreaves, van Ryn, and Phelan (2008) examined a random sample of individuals in a medium-sized city to learn more about health care utilization. They found that 31.5% of Hispanic Americans had no regular health care, compared to 1.7% of European Americans. Approximately 14.7% reported having at least one unmet medical health care need, and 13.0% have at least one unmet mental health care need, compared to 9.1% and 6.4% of

European Americans, respectively. Only 31% of Hispanic American adolescents receive preventative health care, compared to 41% of European American adolescents. Hispanic American adolescents are significantly less likely than adolescents of other races to have had their blood pressure, weight, or height measured in the past year. Also, they are less likely to engage in other safety and health behaviors, such as wearing seat belts, avoiding secondhand smoke, or receiving dental care (Irwin, Adams, Park, & Newacheck, 2009).

Research also indicates a strong relationship between low SES and stress. When a person is of low SES, they inherently have lower tangible resources. This can reduce a person's ability to cope with stressful life situations (Myers, 2009). Individuals and families living in poverty have less access to material resources and face additional barriers in survival (Rose & Hatzenbuehler, 2009). Individuals living in poverty may have additional struggles in managing their daily stress for many other reasons: being of low SES exposes individuals to more stressful life situations, and at a greater frequency, which requires they use more of their existing resources, depleting their bank of reserves. Also, the environment of those living in poverty is not conducive to allowing for the replenishment of tangible, interpersonal, or intrapersonal resources to be later used (Gallo & Matthews, 2003). For example, Cohen, Kaplan, and Salonen (1999) analyzed data from 2,387 participants of the Harris Poll study. Along with demographic information, including SES variables of income and education, participants completed the Perceived Stress Scale and a 16-item questionnaire about major, stressful events in their lives. Results of this study indicated a significant negative relationship between SES and stress. Individuals in the lowest SES category also reported higher levels of hostility, hopelessness, and depression than their middle and high SES counterparts. However, they also reported higher levels of social support. Although

researchers did not measure race in this study, they concluded that low SES was related to an increase in stress, which is likely a result of the mediating pathways of emotion and support resources.

Research has been long-standing in demonstrating a direct relationship between stress and poor physical health outcomes. When human beings perceive a stressful event, activation of the cardiovascular system occurs, increasing heart rate, blood pressure, hormone output, and blood circulation (Brotman, Golden, & Wittstien, 2007). Many studies have been published on the link between stress and depression, cardiac health, autoimmune diseases, and other health conditions (e.g., Cohen, Janicki-Deverts, & Miller, 2007). A review of the literature by Clark, Anderson, Clark, and Williams (1999) found that the subjective experience of stress is associated with physiological distress. Other research has focused on specific health outcomes related to stress, such as having lower t-cell counts to fight infections (Cohen et al., 1998), reduced white blood cell counts, and lower levels of lymphocytes in otherwise healthy individuals (Cohen & Herbert, 1996), which diminishes the human body's ability to fight viruses and bacterial infections. Other studies reported in this review found that constant exposure to stress leads to increased cardiovascular response and a reduction in the ability to cope with daily stress.

Race/Ethnicity Effects on Health

The effects of poverty on health are difficult to disentangle from racial and ethnic factors. Ethnicity is typically associated with an individual's geographic country of origin. It reflects memberships within a group that has a similar culture, shared beliefs, and national origin (Edwards, Fillingim, & Keefe, 2001). Contrary to ethnicity, race is a social construct. It is more commonly associated with skin color or language and less with genetic factors. A

growing body of research suggests a strong link between race and health. At a basic level, self-reported rates of overall health vary by racial groups, with 13.0% of Hispanic Americans reporting fair or poor health, whereas only 8.4% of European Americans report being in fair and poor health. In addition to self-reported health status, significant differences are found in disease rates by racial groups. The prevalence of diabetes is higher for Hispanic American individuals, 11.8%, compared to European American individuals, 7.1%. Hispanic Americans are at a 66% greater risk for developing diabetes than European Americans (CDC, 2011b). Hispanic Americans also experience higher rates of stomach cancer, cervical cancer, HIV, liver disease, and other health conditions than European Americans (Vega, Rodriguez, & Gruskin, 2009).

Van Cleave, Gortmaker, and Perrin (2010) analyzed data from the National Longitudinal Survey of Youth–Child Cohort and found that 42.3% of Hispanic American children had at least one chronic health condition, compared to 36.8% of European American children. With increased acculturation (which is the process by which someone enters into a new culture and is exposed to new social norms, attitudes, beliefs, languages, and institutions), Hispanic American youths tend to engage in a higher percentage of poor health behaviors (Franzini & Fernandez-Esquer, 2004). These poor health behaviors include watching more hours of TV, engaging in less physical activity, eating fewer fruits and vegetables, eating more fast food, and smoking (Gordon-Larsen, Mullan Harris, Ward, & Popkin, 2003). These health behaviors during youth can lead to health problems in adulthood. For example, obesity in adolescents is noted as the strongest predictor of obesity in adulthood. Adolescent obesity also strongly predicts development of hypertension,

cardiovascular disease, and other chronic health conditions over time (Perrin, Bloom, & Gortmaker, 2007).

Culture and Health

While many studies have evaluated interactions of race and health, culture also plays a part in our health and behaviors. Culture is defined as the traditions, values, and ideas shared by a particular group of people (Myers, 2010). Humans learn cultural values and norms through the acquisition of language and by observing behaviors of others in their lives. It influences all human behaviors, including those related to healthy lifestyles (Kagawa Singer, 2012). For example, cultural norms may influence how much an individual believes should be shared with healthcare providers (Unger & Schwartz, 2012). Cultural factors also may serve to promote or discourage health behaviors. Among Hispanic American adolescents, some cultural values may serve to discourage smoking or drinking behaviors. For example, filial piety (strong obedience and respect for elders) has been shown to be a protective factor for use of tobacco and drugs among Hispanic American adolescents (Unger et al., 2002). Additionally, many Hispanic American families place greater value on the collective whole of the family unit, as opposed to individualistic values. This concept, known as familism, emphasizes the importance of the family's needs being greater than one individual's needs. This value reflects that conflicts and problems should be handled within the family, without seeking outside resources, in order to prevent the family from being embarrassed or dishonored in any way (Ramos-Sánchez & Atkinson, 2009). Previous research has indicated that familism is significantly and negatively correlated with engagement in risky behaviors, such as staying out all night without parental consent or smoking cigarettes (Delgado, Updegraff, Roosa, & Umaña-Taylor, 2011).

While Hispanic Americans may experience poorer health outcomes than European Americans, there is also evidence of a *Hispanic Paradox* with health (Markides & Coreil, 1986). This concept reflects the fact that despite lower levels of SES and additional stressful life conditions, Hispanic Americans appear to live longer than European Americans, and experience a lower risk of certain health conditions, such as stroke or myocardial infarction (Smith & Bradshaw, 2006). However, as Hispanic Americans spend more time in the US, chronic daily stressors, such as acculturative stress and fears of discrimination, lead to poorer overall health ratings and increased susceptibility to illnesses such as diabetes (Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009). Recent research has suggested that this form of stress (e.g., acculturation) can lead to more negative health outcomes over time (Franzini, Ribble, & Keddie, 2001). Therefore, this paradox implies that the relationship between ethnicity and health is more complex for Hispanics than for other minority groups, and that the impact of SES, culture, and stress may each play roles in this process.

What is the Link between SES, Stress, Race, Culture, and Health?

There are a myriad of factors associated with health behaviors and outcomes. In order to understand how SES and stress translate into poor health behaviors and outcomes for Hispanic Americans, more research that examines the factors that connect these concepts is needed. The Reserve Capacity Model (RCM; Gallo & Matthews, 2003) is a theoretical framework which proposes that psychosocial factors mediate the relationship between SES and poor health. Specifically, it suggests that poverty operates through psychosocial factors such as stress, perceived discrimination, reserves (e.g., optimism, social support), and negative emotions to affect health. The term *reserve capacity* was borrowed from the aging literature, and is used to describe the bank of resources people utilize, which is generally

smaller for those living in poverty. These resources are comprised of tangible constructs, such as money which can be used in times of emergency; interpersonal constructs, such as a strong social support network; and intrapersonal constructs, such as high self-esteem and good conflict resolution skills.

The RCM makes several predictions. First, individuals of low SES are hypothesized to experience increased stress compared to their high and middle SES counterparts, such as reduced access to health care and social oppression, along with fewer positive life events. Second, increased stress is likely to deplete the reserves from which people can draw during times of need. And, if people of low SES are continually drawing upon their reserves during stress, there is little time to replenish them. Third, stress and low reserves leave people of low SES at a heightened risk for experiencing negative emotions, such as depression or hostility. Fourth, in turn, negative emotions place low SES individuals at greater risk for engaging in risky health behaviors. For example, an increase in depressive symptoms is associated with an increase in sexual risk behaviors (Swanholm, Vosvick, & Chng, 2009). A number of studies also show a positive relationship between symptoms of depression and cigarette smoking (e.g., Munafò, Hitsman, Rende, Metcalfe, & Niaura, 2007; Schleicher, Harris, Catley, & Nazir, 2009). Gallo and Matthews (2003) state that engagement in unhealthy behaviors represent an "intermediate pathway" (p. 34) linking the psychosocial mediators in the model to long-term poor health outcomes. Specific health behaviors, including tobacco use and alcohol use, can be measured as proximal outcomes, given their documented associations with many chronic diseases (e.g., heart disease, diabetes). This model furthers our understanding of the bio-psycho-social pathways that exist in the development of chronic disease and illness.

Reserve Capacity Studies

Since the proposal of the RCM, researchers have begun to test this model with different populations. Gallo, Bogart, Vranceanu, and Matthews (2005) studied a group of 108 women, predicting that SES would negatively relate to positive experiences, reserve capacity, and ultimately negative emotions. They operationalized reserve capacity to include perceived personal control, pessimism, self-esteem, social support, and social conflict. The study found that SES explained 21% of the variance in personal control. Personal control was, in turn, positively related to affect. In regression analyses, researchers found that at low levels of SES, perceived control significantly and positively predicted positive emotions. The authors concluded that having control over your personal environment was a strong factor of intrapersonal reserves, linking SES to emotions.

A later study examined how SES played a role in interpersonal context appraisals, which included constructs such as social conflict, hostility, and friendliness (Gallo, Smith, & Cox, 2006). Interpersonal context was hypothesized to mediate the relationships between SES and perceptions of health. Results of this study indicated that individuals of low SES identified greater levels of hostility and submissiveness in their daily lives. Additionally, interpersonal context appraisals partially mediated the relationship between SES and self-rated health, including bodily pain, general health, and mental health.

Reserve capacity has been linked to the development of metabolic syndrome as well. Gallo, Espinosa de los Monteros, Ferent, Urbina, and Talavera (2007) examined the relationship between SES and blood pressure, waist circumference, and plasma glucose among 146 Hispanic women. Just over one-half of participants, 53.8%, had less than a high school education; another 38.6% had completed high school or GED training, reflecting a

low level of SES within the sample. Almost all participants, 93.2%, completed the survey in Spanish. Reserve capacity variables tested within the study included optimism, perceived control, self-esteem, and social support. Results of this study indicated significant and positive relationships between education level (part of SES), social support, optimism, and perceived control. In turn, these reserve capacity variables were negatively related to waist circumference and blood pressure.

Building upon the cross-sectional study of Gallo and colleagues (2007), Matthews, Räikkönen, Gallo, and Kuller (2008) examined the development of metabolic syndrome, which reflects risk factors for the development of cardiovascular disease, among women over a 12-year period. Results showed that low SES was associated with the development of metabolic syndrome, and that this relationship was mediated by reserve capacity (i.e., optimism, self-esteem, and social support) and negative emotions (i.e., tension, aggression, and anger). Specifically, SES was positively related to reserve capacity, which, in turn, was predictive of negative emotions. Negative emotions, in turn, were associated with the development of metabolic syndrome.

A 2008 study by Brondolo et al. examined the RCM, measuring perceived discrimination in addition to socioeconomic status. Results of this study indicated that perceptions of discrimination and negative trait affect were significantly, positively correlated. Perceived discrimination was also significantly, positively correlated with daily anger and daily nervousness. Thus, researchers demonstrated a positive relationship between perceptions of discrimination and negative emotions. Authors of this article posit that perceived discrimination and negative emotions can increase stress and tax coping strategies, creating a pathway to negative physical health outcomes (Brondolo et al., 2008).

Schöllgen, Huxhold, Schüz, and Tesch-Römer (2011) used the RCM to test whether SES, psychological resources, and social resources affect health. These resources included optimistic self-beliefs, self-esteem, and social support. Results of this study indicated that social resources were significantly and positively related to functional health for all income groups. Social resources (i.e., a network of people who could provide informational and emotional support) had the greatest impact on health outcomes among individuals in the low income category. Psychological resources (i.e., self-esteem, hope, and optimism) also were significantly and positively related to health outcomes for all income levels. For individuals with the lowest levels of education, the effects of psychological resources had an even stronger impact on subjective and functional health.

Gallo et al. (2012) examined whether the path between SES and metabolic syndrome risk was mediated by psychosocial factors including hostility, life engagement, self-esteem, perceived social support, pessimism, depression, anxiety, loneliness, hopelessness, and hostility. They analyzed data from the "Nuestra Salud" study, focusing on middle-aged women of Mexican descent. They found that higher SES was significantly related to higher psychosocial resources, and lower risk for development of metabolic syndrome, but only for more acculturated women. For women who were less acculturated, the psychosocial variables seemed less relevant, and were non-significant in their analyses. Thus, Gallo and colleagues conclude that the inclusion of culturally-relevant variables in studies with the Hispanic population may be of greater importance than they expected when planning their study.

Fortmann et al. (2012) also analyzed data from "Nuestra Salud," again focusing on middle-aged Mexican American women. They examined dips in nocturnal blood pressure,

and whether this varied by psychological resources and acculturation. Having a lack of drop in nocturnal blood pressure, or a low amount of dipping, is reflective of damage to internal organs and is shown to be a risk factor for the development of cardiovascular disease. Results of this study indicate that for more acculturated participants, SES was positively associated with psychosocial resources. In turn, resources were positively related to dipping in nocturnal blood pressure. This relationship was not significant for less acculturated participants. Researchers report that SES and psychosocial variables may be more germane for more acculturated participants.

Another recent study to examine the RCM evaluated a portion of the model among 236 Hispanic Americans (Howarter & Bennett, 2013). Researchers found that the relationship between perceived discrimination and both physical and mental health-related quality of life was partially mediated by reserves, including optimism and social support. These reserves were negatively related to symptoms of anxiety. The final results of this study found that the cognitive-emotional mediators of the RCM accounted for 12% of the variance in the relationship between perceived discrimination and physical health-related quality of life, and 34% of the variance between perceived discrimination and mental health-related quality of life.

To date, only one study has examined the RCM with adolescents. Finkelstein, Kubzansky, Capitman, and Goodman (2007) collected data from 1,167 African American and European American junior high and high school students. Researchers measured coping styles, optimism, parental education, and perceived stress. Results of this study indicated that perceived stress was significantly and negatively correlated with optimism. Researchers also found that optimism mediated the relationship between parental education and perceived

stress, accounting for nearly 30% of the variance. The effects of optimism on this relationship were stronger for European Americas than for African Americans.

In summary, there is ample research which has tested this model and found support for the hypothesized pathways. An individual's reserves – or lack thereof – are predictive of engagement in health behaviors, and in the development of cardiac-related health conditions, as well as metabolic syndrome. This model is useful in making predictions for European Americans, as well as for minorities, but additional research using the model to predict adolescent health behaviors is needed.

Extending the RCM: Integration of Cultural Factors

Recently, Gallo and colleagues (2009) proposed an adapted version of the RCM that integrates cultural factors. Specifically, Gallo suggests that being an ethnic minority is associated with the potential for additional daily stressors, such as discrimination or acculturation, which are independent of SES. The combined effects of being a minority and being of low SES can have an additive effect that contributes to stress responses differently than each of these variables uniquely. As such, Gallo proposed a revised RCM, including consideration for ethnic variables, such as ethnic identity, acculturation, culture-specific stressors (e.g., discrimination), cultural beliefs, and cultural roles (Figure 1). An individual's SES and cultural variables can expose him/her to stressful situations (e.g., discrimination and acculturative stress). An individual's general and culture-specific reserves are used in response to these situations. Culture-specific reserves, such as familism, impact an individual's perceptions of stressors. For example, individuals with a high level of familism may be safeguarded from the full effects of stress, based on the additional support received from family members. A study of immigrant populations by Jasinskaja-Lahti, Liebkind,

Jaakkola, and Reuter (2006) evaluated the link between social support (including familial social support) and negative emotions. Results indicated that lower levels of social support were significantly associated with negative emotions, including depression, anxiety, and psychosomatic symptoms. Thus, low levels of individual reserves can lead to an increase in negative emotions. Finally, negative emotions can lead to an increase in engagement in poor health behaviors, thus resulting in poor health outcomes. The negative impact of depression on one's health and quality of life was demonstrated in a study by Strine et al. (2008). Results of this study indicated that individuals who had higher levels of depressive symptoms were more likely to engage in negative health behaviors, such as smoking, alcohol consumption, and lack of exercise. A later study (Strine et al., 2009) found that participants with higher scores on a measure of depressive symptoms were also more likely to have poor health-related quality of life, experience more frequent physical distress, and note that they suffered from activity limitations.

Researchers have tested aspects of Gallo's ideas about how culture-related stress can exacerbate the documented effects of stress on negative emotions, such as hostility and depression (though not specifically through the lens of the expanded RCM). For example, Bennett, Merritt, Edwards, and Sollers (2004) investigated the impact that either a racist or an ambiguous scenario had on emotions of 74 African American participants. As expected, scenarios that were blatantly discriminatory in nature evoked negative emotions in participants. However, those negative emotions subsided relatively quickly for participants. The authors suggest this could be because it was easier for participants to dismiss these acts as merely ignorant and bad behavior. The study also found that when participants perceived an ambiguous scenario to be discriminatory in nature, they had higher levels of negative

emotions compared to when the scenario was perceived to be benign. Additionally, those individuals who experienced negative emotions in response to the ambiguous scenario had longer recovery periods compared to those exposed to blatantly discriminatory situations. Finally, individuals who self-reported having personally experienced discrimination were more likely to conclude that a situation was discriminatory, and to have higher levels of negative emotions related to the situation witnessed, than participants who did not report personal experiences of discrimination.

Within Gallo's reconceptualization of the RCM, one example of a culture-specific stressor is discrimination. Racist acts constitute discrimination, which reflects the attitudes, beliefs, and institutional arrangements that oppress or belittle groups of people based on their ethnicity or race (Clark et al., 1999). Perceived discrimination is the awareness or belief that a situation is discriminatory. The current literature suggests that an individual need only *perceive* an act or situation as racist to experience the deleterious effects of discrimination (Burgess, Ding, Hargreaves, van Ryn, & Phelan, 2008). According to research published by the Pew Hispanic Center, 34% of Hispanic Americans report experiencing an instance of discrimination within the last five years. For young adults (ages 18 – 29) this statistic increases to 40%. Other researchers have found that a total of 61% of Hispanic Americans believe that discrimination is a major problem for their ethnic group (Lopez, Morin, & Taylor, 2010). The continuous stress arising from perceptions of discrimination can lead to increased heart rate, blood pressure, and hypervigilance (Mays et al., 2007). Perceptions of discrimination can serve as a stressor with direct effects on health (e.g., Bennett et al., 2004), as well as on physical and mental health-relate quality of life (Howarter & Bennett, 2013).

Although many studies operationalize discrimination from the viewpoints of adults, adolescents are also at risk for perceiving it. For example, Delgado and colleagues (2011) found that adolescent high school students reported experiencing discrimination from their peers and within the community. This perceived discrimination led to an increase in symptoms of depression; the relationship between perceived discrimination and symptoms of depression was even stronger for adolescent females. Further, perceived discrimination was positively related to participation in risky behaviors, including drinking and substance use.

Within Gallo's reconceptualization of the RCM, another example of a culture-specific stressor is acculturation. Acculturation is the process by which immigrants adopt and integrate the cultural elements of their new society (Lara, Gamboa, Kahramania, Morales, & Hayes Bautista, 2005). This can include learning the language of the new culture; adopting local customs of clothing, food, and social activities; and beliefs (Rodriguez, Myers, Bingham Mira, Flores, & Garcia-Hernandez, 2002). Stress that results directly from the process of acculturation is referred to as *acculturative stress* (Hovey, 2000). In some instances, individuals may feel pressured to ignore or abandon their original culture to adopt this new culture, which is referred to as unidimensional acculturation. This type of acculturation was prevalent among European immigrants coming to the US through the mid-1900s (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Currently, immigrants may try to adopt some aspects of the new culture, while maintaining some of their original cultural traditions as well, which is referred to as biculturalism (Lara et al., 2005).

The impact of acculturative stress on health behaviors can differ by sex, suggesting different coping mechanisms adopted by the sexes. For example, a recent study evaluated drinking patterns among Hispanic Americans. One finding of this study was that as

acculturation increased, Hispanic American women became more likely to engage in binge drinking and to drink alcohol with greater frequency. This pattern was not the same for Hispanic American males for whom drinking was greatest at low levels of acculturation (Caetano, Ramisetty-Mikler, Wallisch, McGrath, & Spence, 2008). A study by González Whal and McNulty Eitle (2010) also found that acculturation was significantly and positively related to alcohol consumption among Hispanic American females. For Hispanic American males in this study, drinking increased with moderate levels of acculturation, but was lowest at high levels of acculturation. A review of the literature by Bethel and Schenker (2005) evaluated studies of smoking and acculturation for Hispanic Americans. These authors reported that after evaluating eleven studies, only one study found a positive relationship between acculturation and smoking for males. However, acculturation was found to be positively related to smoking rates for Hispanic American women in almost 86% of studies evaluated. Thus, Hispanic American women were more strongly impacted by acculturation than Hispanic American males, with women smoking more with acculturation.

A study by Gorman, Gahazel Read, and Krueger (2010) evaluated health behaviors among Hispanic Americans. These researchers found that excessive drinking, smoking, and obesity increased for women along with acculturation. For men, acculturation was positively associated with smoking, obesity, and moderate drinking, but not heavy drinking. For both groups, psychological distress, hypertension, and general poor physical health increased with acculturation, but patterns varied between sexes, with women experiencing more mental health distress earlier in their process of acculturation compared to men. Another study of Hispanic American adolescents found that boys were more impacted by acculturation than girls (Saint-Jean, 2010). Within this study, males higher in acculturation were more likely to

engage in delinquent behaviors (e.g., drug use), while girls did not. In fact, acculturation appeared to strengthen girls' commitment and general sense of family.

As immigrants acculturate to the US, they perceive more racism in their daily lives (Franzini & Fernandez-Esquer, 2004). This experience is noted in adults as well as adolescents. Individuals who are born in the US are not immune to this form of stress, as they may struggle to find an identity with the US culture and within the culture of their parents (De la Rosa, 2002). As levels of acculturation and related stress increase, individuals report more negative health outcomes, which are partially due to an increase in negative health behaviors, such as poor eating habits and drinking behaviors (Franzini & Fernandez-Esquer, 2004). Among Hispanic American adolescents, lower levels of acculturation are associated with lower levels of alcohol consumption (Allen et al., 2008). Researchers have speculated the underlying reasons why low levels of acculturation are associated with less stress and better health. It is possible that individuals with low levels of acculturation interact less with the majority culture, and therefore are able to avoid interactions that could be perceived as discriminatory. Additionally, the lack of English language proficiency can prevent individuals from understanding discussions and interpreting social situations as discriminatory, which can lead them to be unsure if they experienced discrimination, potentially resulting in lower levels of stress (Bolívar & Chrispeels, 2011). In turn, low stress can protect health directly via physiological mechanisms, and indirectly via lower levels of engagement in unhealthy coping behaviors.

Culturally Related Resources

Within Gallo's reconceptualization of the RCM, she outlines culture-specific reserves that could insulate minority groups from the effects of poverty, stress, and discrimination on

health. Gallo states that among Hispanic American families, certain cultural values are more prevalent than among mainstream American families, and that these cultural values can be protective. Furthermore, these values may play a role in the psychosocial development of youth, and their perceptions of the world around them (Calderon-Tena, Knight, & Carlo, 2011).

Gallo suggests that *familism* is a cultural value that may be useful to individuals during times of need. Familism has been shown to be a protective factor, preventing engagement in risky or unhealthy behaviors. In 2007, Romero and Ruiz assessed familism among a sample of adolescents (predominantly Hispanic Americans). Results of this study showed that familism was significantly and negatively related to engagement in risky behaviors. However, levels of familism varied by sex, with males reporting higher levels of family proximity (the amount of time they spent with their family members), but perceiving fewer benefits, such as feeling they can disclose personal information or cope with stress, from this closeness than females. Similar studies have found familism to be negatively related to alcohol use (Sale et al., 2005), drug use (Ramirez et al., 2004), and behavior problems (Marsiglia et al., 2009).

Another cultural value often found among Hispanic Americans is *fatalism*. Fatalism is the belief that fate or external forces are responsible for what happens to an individual (Ramos-Sánchez & Atkinson, 2009). This is similar to the mainstream American concept of external locus of control (Joiner, Perez, Dineen Wagner, Berenson, & Marquina, 2001). This can be a potentially negative or pessimistic view through a mainstream lens, as individuals see things like health conditions as outside of their control, and unable to be prevented (Espinosa de los Monteros & Gallo, 2011). However, for Hispanic Americans, fatalism may

be considered a factor that insulates one from the effects of stress on health. Gallo et al. (2009) notes that fatalism is strongly related to religiosity, which serves as a protective factor for individuals. Viewing fatalism through a cultural lens, we may consider it to be less of a loss of control, and more of an ability to let go of anxiety or distress surrounding life or health. For example, there is the Christian faith adage, *Let go and let God*, which encourages individuals not to focus on problems that they cannot change, or over which they have little control. In support of the protective effects of fatalism on health in Hispanics, new research by Espinosa de los Monteros and Gallo found it to be a protective factor in the development of cardiometabolic risk (L. Gallo, personal communication, August 24, 2012).

A third culture-specific resource that can protect against the effects of poverty and stress on health is *family cohesion*. Family cohesion is reflective of the emotional support or bonds between family members (Marsiglia et al., 2009). It is also reflected through interconnectedness between family members, and has been associated with better mental and physical health outcomes (Leidy, Guerra, & Toro, 2010). A 10-year longitudinal study of African American and European American girls found that family cohesion was significantly and negatively related to soda consumption (Franko, Thompson, Bauserman, Affenito, & Striegel-Moore, 2008). A study by Mason, Hawking, Kosterman, and Catalano (2010) followed an ethnically diverse group of 808 10-year olds. After 11 years of monitoring, researchers found that higher levels of family cohesion were predictive of lower levels of both alcohol use and symptoms of depression. Thus, evidence supports an essential role of family on health behaviors among adolescents.

Negative Emotions, Poor Health Behaviors, and Poor Health Outcomes

Following the sequence outlined by the RCM, and by Gallo's reconceptualization of it, the impact of stress and discrimination operate through reserve capacity to negatively affect well-being. That is, low reserves are hypothesized to lead to negative emotions, including distress symptoms (e.g., depression and anxiety). While the high school years may be glorified as the "best years of your life," this is not always true. In fact, Hispanic American females have the highest prevalence of depression among all racial categories of adolescents in the US, with 42.3% reporting feelings of hopelessness or sadness for a period of two weeks or more during the past year, compared to only 17.8% of European American adolescents (Youth Risk Behavior Surveillance System, 2009a). Adolescent depression is significantly and positively related to the development of chronic depression during adulthood, which is one of the leading causes of morbidity and mortality (Garber et al., 2009). In fact, symptoms of depression are present by age 14 for more than 75% of adults who have a diagnosable mental illnesses (Mulye et al., 2009).

In the past two decades, researchers have seen increased reporting of adolescent depression levels. In his 2006 book, *Against Depression*, Peter Kramer notes that depression often begins in adolescence and continues through adulthood. Rates of adolescent depression are associated with failure to complete high school, failure to complete college, committing suicide, experiencing career failure, and developing substance abuse problems. Furthermore, having low SES has also been demonstrated to increase rates of depression. Multiple studies have demonstrated relationships between adolescent depression and psychosocial factors, including perceptions of discrimination, parental involvement, economic distress, and living in high-crime neighborhoods (Simons et al., 2002).

While there is no single cause for adolescent depression, adolescents whose families lack closeness, togetherness, and factors similar to cohesion are at an increased risk for developing depression and even committing suicide (Bilgin, Fulya, & Satar, 2007). Leaders in the field of psychology, such as Murray Bowen and Aaron Beck, have emphasized the role of family cohesion and communication as factors in mental health. The quality of family communication, cohesion, and care are all factors associated with adolescent emotional and behavioral adjustment (Pavlidis & McCauley, 2001). For example, a study by Essau (2004) evaluated whether family closeness had an impact on depressive symptoms of adolescents. Results indicated that adolescents who reported lower levels of attachment to their parents scored higher on depression measures (indicating less depression). These results are consistent with ones reported by Nada Raja, McGee, and Stanton (1992), who found a negative relationship between levels of depression in adolescents and parental attachment.

According to the RCM, negative emotions (such as depression) are associated with a variety of what Gallo and Matthews (2003) term "intermediate paths" (p. 34), such as poor health behaviors, obesity, and immune system functioning. In turn, these intermediate paths are associated with poor health outcomes, including cardiovascular morbidity and mortality, and all-cause mortality. Research has been long-standing in demonstrating an indirect relationship between stress and poor physical health outcomes. When human beings perceive a stressful event, activation of the cardiovascular system occurs, increasing heart rate, blood pressure, hormone output, and blood circulation (Brotman, Golden, & Wittstien, 2007). Many studies have been published on the link between stress and depression, cardiac health, autoimmune diseases, and other health conditions (e.g., Cohen, Janicki-Deverts, & Miller, 2007). For example, Strine and colleagues (2008) evaluated the relationships

between negative emotions and poor health behaviors among a random sample of healthy adults. The study found that individuals who had a current or prior diagnosis of anxiety or depression were significantly more likely to be obese, drink alcohol in excess, and be physically inactive.

In line with the RCM, research documents an association between negative emotions and smoking. For example, individuals who smoke cigarettes often report that smoking produces an anxiolytic effect, reducing the impact of negative emotions (Munafò & Araya, 2010). A study of 315 university students classified as smokers found that symptoms of depression were positively related to the number of cigarettes smoked by participants (Schleicher, 2009). The results of this study further showed that the experience of negative affect mediated this relationship. Thus, participants who experienced negative emotions smoked as one means of coping with their feelings. Similarly, Audrain-McGovern, Rodriguez, and Kassel (2009) found that symptoms of depression during adolescence (age 14) predicted smoking during late-adolescence and early adulthood.

Because most adults begin smoking during adolescence (Kelder et al., 1994), understanding the effects of poverty, stress, and negative emotions on smoking during adolescence is crucial. Research suggests a variety of predictors of adolescent smoking. First, adolescent SES is negatively associated with smoking cigarettes (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Second, in addition to SES being a risk factor for smoking, existing research reflects that Hispanic American adolescents are at a higher risk of smoking, and for developing depression, as compared to other ethnic groups (Johnston et al., 2009). Although rates of smoking in general have decreased among European American adolescents, among Hispanic American adolescents, rates of heavy smoking increased from

3.1% in 1991, to 6.4% in 2009 (Jones, Kann, & Pechacek, 2011). These smoking rates have important implications for health. According to the National Center for Health Statistics (2007), for over fifty years heart disease has persistently been the highest cause of mortalities, with smoking being a major risk factor. Once diagnosed with cardiovascular disease, Hispanic Americans are 1.3 times more likely to die due to complications related to the disease, as compared to European Americans. Together, these data suggest that smoking behavior in Hispanic American adolescents poses a severe long-term health risk, particularly for cardiovascular disease. That risk is compounded when we consider co-morbid risk factors, and medical treatment disparities, experienced by Hispanic Americans. Third, family structure can be a protective factor against poor health behaviors, such as smoking, among Hispanic American adolescents. A study by Mahabee-Gittens, Xiao, Gordon, and Khoury (2012) found that among Hispanic American adolescents in their study, several family-related variables provided a protective factor against smoking. For example, Hispanic American adolescents who felt connected to their parents, and believed their parents were likely to monitor their behaviors, were significantly less likely to have ever smoked, or to have recently smoked.

A second unhealthy behavior subsumed within Gallo and Matthew's (2003) intermediate path is excessive alcohol consumption. Multiple studies support the negative relationship between SES and use of alcohol (Caetano et al., 2008; Lowry, Kann, Collins, & Kolbe, 1996). Research shows that negative emotions can result in alcohol abuse (e.g., Conner, Pinqurt, & Gamble, 2009). Excessive alcohol consumption has been linked to multiple chronic health conditions, including hypertension, cardiovascular disease, diabetes, stroke, and congestive heart failure (O'Keefe, Bybee, & Lavie, 2007). Alcohol abuse and

dependence during adolescence is significantly and positively related to the same behavior as an adult (Rao, Daley, & Hammen, 2000). A recent study evaluated substance use among a sample of Hispanic, African, and Asian Americans (Tran, Lee, & Burgess, 2010). Within this sample, Hispanic Americans reported experiencing more racial discrimination than African or Asian Americans. Perceptions of discrimination were also related to more frequent alcohol consumption, as was being of low SES. A variety of other negative emotions have been connected to drinking behaviors among Hispanic Americans. A study by Blume, Resor, Villenueva, and Braddy (2009) evaluated variables including anxiety, hopelessness, acculturation, and alcohol use among a sample of community-dwelling Hispanic Americans. Their results showed that lower levels of anxiety were significantly related to lower levels of alcohol consumption, abuse, and dependence. Similarly, symptoms of depression have been shown to predict or relate to alcohol use. For example, Gilman and Abraham (2001) followed 14,480 adult participants over one year to evaluate the relationship between alcohol use and symptoms of depression. They found that having higher symptoms of depression at baseline was significantly related to alcohol abuse and dependence after one year. This could potentially predict the development of cardiovascular disease or other chronic health conditions.

In sum, the reconceptualized RCM integrates cultural factors that represent stressors (e.g., acculturative stress) and resources (e.g., familism) that are unique to minority populations in the US. Disparate lines of research support the predictions that poverty increases stress and depletes reserves. In turn, the experience of negative emotions is likely to elicit coping mechanisms that are unhealthy in nature—what Gallo and Matthews term "intermediate pathways." When applied to Hispanic American adolescents, the behavioral

responses they use when faced with stressors may, in the long-term, increase their risks for chronic conditions such as heart disease. That is, problem drinking and smoking among adolescents can have very serious consequences for their long-term health.

Gaps in the Literature

Adolescents may be less likely to be diagnosed with cardiovascular disease or other chronic health conditions than older adults; however, adolescent health behaviors are important to examine for a number of reasons. Initiation of what may be considered 'adult' behaviors, such as alcohol or tobacco use during adolescence, increases the likelihood that these behaviors will continue and further increase into adulthood (Mulye et al., 2009). There is little research using the RCM with adolescents to predict health behaviors. While there is existing research to demonstrate the proximal and distal effects of negative health behaviors of adolescents, we know very little about the motivations for, or antecedents to, those same behaviors. Additionally, there is little research that takes cultural factors into consideration when trying to predict adolescent health behaviors. The RCM is a framework that evaluates these behaviors, including culturally relevant constructs that can allow us to develop a fuller understanding of the psychological and social factors predictive of initiation of smoking and drinking.

In addition to the need for research related to adolescent health behaviors, it is important to consider possible sex differences. Research suggests that acculturation impacts males and females differently, or at varying levels of strength. In fact, some researchers have found that acculturation has opposite effects on health behaviors for men versus women. The literature has been inconsistent in reflecting how acculturation impacts smoking, alcohol use, consumption of high-fat foods, and engagement in physical exercise (Corral & Landrine,

2008). Kulis, Marsiglia, Kopak, Olmsted, and Crossman (2012) found that acculturation among young adolescents (ages 9 – 13) led to increased involvement with poor health behaviors, such as smoking, alcohol use, and interest in using drugs. While this was true for both males and females, the relationship was stronger for males. However, the authors propose that with age, females may be at a greater risk for increased use of alcohol and smoking, based on their growing intentions to engage in these behaviors. Multiple studies have found an interaction between sex and drinking (e.g., Caetano et al., 2008; González et al, 2010), health behaviors (e.g., Gorman et al., 2010, Saint-Jean, 2010), familism (Romero & Ruiz, 2007), and other variables. Some of these studies report conflicting findings. This project proposes to add to the literature by testing a more complete model including cultural variables, and testing for differences by sex among adolescents.

Hypothesized and Exploratory Models

Based on the literature cited above, I tested two structural models based on the expanded RCM. First, I tested the hypothesized model shown in Figure 2. This model is based on past research documenting strong associations between SES and health behaviors, independent of sex. I hypothesized that:

1. SES at year one would have a direct and negative relationship with alcohol use and smoking at year three (controlling for year one levels), and that
2. SES would operate indirectly through perceptions of discrimination, acculturative stress, culture specific reserve capacity, and negative emotions to affect alcohol use and smoking at year three (controlling for year one levels).

That is, I predicted that perceptions of discrimination, acculturative stress, culture specific reserves, and negative emotions would partially mediate the association between SES and poor health behaviors.

Second, I tested an exploratory model that examined the effects of acculturation on health behaviors (see Figure 3). There is literature to support the following pathways, regardless of sex:

1. Acculturation would be positively related to perceptions of discrimination and acculturative stress, but negatively related to reserve capacity.
2. Perceptions of discrimination and acculturative stress would be negatively associated with reserve capacity.
3. Symptoms of depression would be positively associated with drinking and smoking.

In addition to these predicted pathways, it was important to examine relationships in the model that may have differed by sex. Research suggests that acculturation has different effects for each sex, and that the strength of the relationships may differ between sexes. For example, studies indicate that acculturation is positively related to smoking for females, but not males (Bethel & Schneker, 2005; Wilkinson et al., 2005). McCoy et al. (2010) found that higher levels of acculturation were related to lower levels of alcohol use for adolescent males and females. However, adolescent males were more likely than females to use alcohol, even after controlling for acculturation. Thus, some of my hypotheses differed by sex:

1. Acculturation at year one would have a positive relationship with alcohol use at year three for both males and females, but would be stronger for males (controlling for year one levels).

2. Acculturation at year one would have a positive relationship with smoking at year three for both males and females, but would be stronger for females (controlling for year one levels).
3. Perceptions of discrimination would be positively related to symptoms of depression for both males and females, but would be stronger for females.
4. Acculturative stress would be positively related to symptoms of depression for both males and females, but would be stronger for females.
5. Reserve capacity would have a negative relationship with symptoms of depression for both males and females, but would be stronger for females.

CHAPTER 3

METHOD

Project *Reteniendo y Entendiendo Diversidad para Salud* (RED; Retaining and Understanding Diversity for Health) is a longitudinal study of cultural identity, acculturation, family patterns, and substance use among Hispanic American high school students in southern California (Unger, Ritt-Olson, Wagner, Soto, & Baezconde-Garbanati, 2009b). Public high schools with a greater than 70% Hispanic student population were targeted as recruiting locations. School principals and superintendents for 31 high schools were approached and asked for their consent to allow participation. Of these schools, eight agreed to participate in the project. One of these schools had scheduling conflicts that would have prevented 50% of students from being able to participate, and withdrew from the study. The final group included seven high schools in the Los Angeles public school district.

Since the students in this study are minors, the next level of consent was attained from parents. Students were given informed consent forms and asked to take them home for parent signatures. As an incentive to return the form, students were given a pizza party if all students in a classroom returned the form (regardless of whether consent was given or denied). For students who did not return the consent form, trained research assistants contacted parents by phone to ask for verbal consent to participate. Finally, students were allowed to consent or decline participation, even if their parents had given consent to participate. Students who did not participate in the research study were allowed to do homework, draw, sleep, or any other activity they desired as long as it could done quietly,

while seated at their desks. All protocols, consent forms, questionnaires, and research procedures were approved through the University of Southern California's Institutional Review Board. A letter of support for use of data from Project RED is provided by the study's principal investigator, Dr. Jennifer Unger, in Appendix A.

Participants

Across the seven schools, 3,218 students were invited to participate in Project Red. Of those students, 2,420 (75%) provided the necessary parental consent, and also gave their own assent. From this group, 2,222 (92%) completed the survey in 9th grade. Of this group, 1,953 (88%) self-identified as Hispanic or Latino or reported a Latin American country of origin. Each year, the research team returned to the school and reviewed class rosters to find the original group of participants. Students were visited during study hours and invited to complete the next follow-up questionnaire. For students who had changed schools, transfer information was obtained from the school or from the parents, who provided contact information at the time of consent. This procedure was repeated in the third year of the study. Of the 1,953 Hispanic students who completed the initial questionnaire in their 9th grade year, 1,564 (80%) also completed questionnaires in 10th and 11th grades. There were 150 students (8%) who completed questionnaires in 9th and 10th grades but not in 11th grade, 45 (2%) completed a survey in 9th and 11th grades only, and 192 (10%) were lost to attrition before the 10th grade survey. After removing cases with insufficient data and multivariate outliers, I had a final sample of 1,386 participants. I ran ANOVAs to examine potential differences between participants who completed all three waves, versus those who completed only one or two. Since group sizes differed significantly, Games-Howell post-hoc

corrections were used, which indicated no significant differences between groups on any demographic or outcome variables.

After accounting for attrition, inclusion criteria, parental consent, and student assent, a total of 1,564 Hispanic students completed all three waves of data collection for Project RED. At year one (in 2005), participants were high school freshman, ranging in age from 12 – 16 years. The majority of the students, 85.1%, were 14 years old. Sex was fairly evenly distributed (females = 53.5%). All participants self-identified as either Hispanic or Latino in ethnicity. As part of this study, participants completed three questionnaires over a period of three years, from 2005 – 2007. Data were collected on the same cohort of students, beginning in their freshman year (2005), with the second wave of collection occurring during their sophomore year (2006), and the third wave being collected during the junior year of high school (2007). Although the questionnaire for this project included a variety of measures, for my dissertation, I focused on SES, acculturation, perceived discrimination, acculturative stress, familism, family cohesion, fatalism, symptoms of depression, alcohol use, and smoking. In order to prevent any embarrassment or stigma attached to language, all surveys included measures in both English and Spanish. To prevent similar feelings based on literacy, a researcher was present to read surveys aloud during data collection times. Students were encouraged to follow along if they so desired, but were not identified as needing assistance (Wagner et al., 2010). Well-validated measures were used in this study, several of which are described below.

Measures

To ensure equal opportunities for all participants, surveys included all of the study measures in both English and Spanish. Measures which had been previously published in

Spanish were used when available. If translation was needed, the research team used one translator to convert items from English to Spanish. After this process, a different translator was used to translate the items from Spanish back into English. A translation team was created including bilingual researchers, with Mexican, Argentinean, and Salvadoran ancestry. This team was required to check all translations and verify that the idioms, grammar, and vocabulary used were appropriate for Hispanic American adolescents living in the southern California area (Unger, Ritt-Olson, Soto, & Baezconde-Garbanti, 2009a). Any discrepancies were discussed until a consensus was reached on the appropriate vocabulary for each item. Appendix B provides additional information about each measure, including exact question wording in English, response options, and at what year in the study it was collected.

Socioeconomic status. To measure SES at year one, participants responded to eight questions reflecting a variety of information. It is important to assess a number of constructs to gather this information because adolescents may not know about their families' level of income. First, questions asked about parent education levels (both mother and father, if applicable) and home ownership. Second, existing literature suggests adolescents are able to assess their SES with relatively high levels of accurately when reporting more objective items, such as material items or access to technology (Andersen et al., 2008; Wardle, Robb, & Johnson, 2002). Thus, questions asked participants about having access to a computer and internet in the home. Students also were asked to report the number of persons living in the home, followed by the number of rooms in the home (not including the kitchen and bathroom). A ratio was then calculated to reflect the number of rooms per person in the home, with higher ratios reflecting less crowding and more space, which is indicative of higher SES. Next, Ridolfo and Maitland (2011) found high school students to be high in

rates of accuracy in reporting use of public assistance (i.e., 94 – 97%). Thus, participants were also asked whether or not they were eligible for free or reduced-price lunches. Finally, participants reported their ZIP code, which was used to locate Census data on reported median household income. Information obtained from the Census indicates median household incomes ranging from $29,000 - $73,000 (Wagner et al., 2010).

Acculturation. Acculturation was measured at year one, using the revised Acculturation Rating Scale for Mexican-Americans-II ([ARMSA-II], Cuellar, Arnold & Maldonado, 1995). This scale is designed for use with Hispanic populations, specifically targeting those from Mexico, and supports the bidimensional theory of acculturation (Lara et al., 2005). The ARSMA-II captures language use, cultural heritage, and level of engagement with behaviors consistent with American or Hispanic cultural activities (e.g., "I enjoy Spanish language movies"). Two subscales can be calculated from this measure: Anglo (US) Orientation, and Hispanic Orientation, which can be compared to assess direction and level of acculturation. Since I was interested in the level of adjustment by Hispanic teenagers to the US culture, I chose to use the US Orientation subscale in this project. Items were measured using a five-point Likert scale (1 = *Not at All*, and 5 = *Almost always/Extremely Often*), with higher scores indicating greater levels of US orientation or acculturation. Good levels of internal consistency for this scale have been demonstrated in research with similar populations, α = .83 (Wagner et al., 2010). I also found acceptable levels of reliability within this data set, α = .73.

Perceived discrimination. Individual perceptions of discrimination were measured during year two of the study, using a 10-item scale, reflecting levels of daily perceived discrimination (Guyll, Matthews, & Bromberger, 2001). Participants were asked to answer

questions on how they were treated based on their ethnic or cultural background, such as "People act as if they're better than you." Responses are based on a four-point Likert scale (1 = *Never*, 4 = *Often*), with higher scores indicating a higher level of Perceived Discrimination. This measure can be completed in approximately five minutes and has shown a high level of internal consistency in other adolescent minority samples (e.g., α = .79; Matthews, Salomon, Kenyon, & Zhou, 2005). Other articles published using Project RED data report high levels of reliability (α = .89; Lorenzo-Blanco et al., 2011). I found similarly high levels of reliability, α = .88.

Acculturative stress. In order to measure acculturation stress, the Multidimensional Acculturative Stress Inventory (MASI) was administered (Rodriguez et al., 2002), during the second year of the study. The MASI is a 36-item measure, with four subscales, designed to assess the pressures associated with adjusting to the Anglo/American culture: Spanish Competency Pressures, English Competency Pressures, Pressure to Acculturate (e.g., "At times, I wish that I were more American"), and Pressure against Acculturation (e.g., "I feel uncomfortable when others expect me to know Latino/Hispanic ways of doing things"). Research using this measure suggests including all subscales in analyses to adequately reflect the stress in the process of acculturating (i.e., Driscoll & Torres, 2013; Rudmin, 2009). Items were measured using a six-point Likert scale, where individuals are asked to rate the level of stress associated with each statement (1 = *No/Does not Apply*, and 6 = *Extremely Stressful*), where higher scores indicate higher levels of stress associated with the acculturative idea. Overall internal reliability for this measure has been shown to be good (α = .90), as were measures of validity when compared to variables measuring acculturation and psychological distress (Rodriguez et al. 2002). Following the original factor structure, I found adequate

levels of reliability for all four scales: Spanish Competency Pressures α = .85, English Competency Pressures α = 92, Pressure to Acculturate α = .77, and Pressure against Acculturation α = 80.

Familism. In order to assess the construct of familism, or the belief that family is of utmost importance and the needs of the family are prioritized over the needs of the individual, a four-item subscale by Unger and colleagues (2006) was used. Questions included items such as, "If anyone in my family needed help, we would all be there to help them." Scoring is based on a four-point Likert scale (1 = *Definitely No*, 4 = *Definitely Yes*) with higher scores indicating higher levels of familism. Prior to Project RED, the items comprising this subscale had not been published, but internal consistency for the full scale was adequate, α = .76 (Unger et al., 2006). Studies previously testing these data found comparable levels of reliability (α = .77; Soto, Unger, Ritt-Olson, Soto, Black, & Baezconde-Garbanati, 2011). I found similar, acceptable levels of internal consistency: α = .80.

Family cohesion. The Family Adaptability and Cohesion Evaluation Scales, version two (FACES II), was developed to measure emotional bonds among family members (Olson, Portner, & Bell, 1982). The measure includes six items that measure family cohesion (how close or bonded a family is), and was administered at year two. Questions on this measure include items such as, "Family members feel very close to each other," and, "In our family, everyone shares responsibility." Answers for each question are based on a five point Likert scale (1 = *Almost Never*, 5 = *Almost Always*), with higher scores indicating higher levels of family cohesion. Other publications using this measure have found high levels of internal consistency with similar samples (e.g., α = .89; Marsiglia et al., 2009). Previously published Project RED studies note acceptable levels of reliability as well (α = .77, Lac, Unger,

Basáñez, Ritt-Olson, Soto, & Baezconde-Garbanati, 2011). I found similar levels of internal consistency, α = .79.

Fatalism. At year two, the measure of fatalism, or the belief one lacks control of his/her own destiny, includes items from a study by Cuéllar, Arnold, and González (1995), which were modified to be more applicable to an adolescent population. Four items were used, including, "People can't really do much to change what happens in life. You just have to accept things." These statements were rated on a four-point Likert scale (1 = *Definitely No*, 4 = *Definitely Yes*) with higher scores indicating higher levels of fatalism. No studies using this measure with an adolescent population were found. Other studies using this data set have demonstrated appropriate levels of internal consistency in using this measure (α = .77; Soto et al., 2011). I found similar, acceptable levels of internal consistency, α = .78.

Symptoms of depression. The Center for Epidemiologic Studies Depression Scale (CES-D) was administered during year two of the study to indicate levels of depressive symptoms experienced by participants over the last seven days. This measure has been in use for over 40 years (Radloff, 1977). It is brief, including 20 items which ask individuals to describe how often they have felt certain emotions or behaved in a particular way, such as, "I talked less than usual." Responses are based on a four-point Likert scale (0 = *Less than 1 day or never*, to 3 = *5-7 days*). Scores are summed with a range of 0 – 60, with higher scores reflecting more symptoms of depression. This measure has shown strong reliability and validity with samples of Hispanic American adolescents (e.g., α = .91; Umaña-Taylor & Updegraff, 2006). Other research projects using this same data set report high levels of reliability as well (α = .88; Lorenzo-Blanco et al., 2011). I found a similar reliability level, α = .88.

Alcohol use. Adolescent alcohol use was measured using items from the Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Survey (CDC, 2009b). The study used three questions relating to lifetime use of alcohol as well as alcohol use in the past 30 days. For example, "During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?" with seven response options (1 = *0 days*, to 7 = *20 or more days*). National samples report skewness of the distribution based on students who do not drink alcohol, resulting in recommendations to dichotomize these variables (CDC, 2009a). Following these recommendations, the three items were each scored as 0 or 1, where 0 = *No use of alcohol*, and all other options earned a score of 1. The scores for these three questions were summed to create a composite score ranging from 0 – 3, with higher scores indicating greater use of alcohol. After recoding variables as described, I found adequate levels of internal consistency at year one, α = .74, and good levels of internal consistency at year three, α = .82.

Smoking. As with alcohol use, smoking behaviors were measured using items from the CDC Youth Risk Behavior Survey (CDC, 2009b). The study used three questions relating to lifetime use of smoking as well as smoking in the past 30 days. For example, "During the past 30 days, on how many days did you smoke cigarettes?" with seven response options (1 = *0 days*, 7 = *All 30 days*); and, "During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day" with seven response options?" (1 = *I did not smoke cigarettes in the past 30 days*, 7 = *More than 20 cigarettes per day*). National samples report skewness of the distribution based on students who do not smoke, resulting in recommendations to dichotomize these variables (CDC, 2009a). Following these recommendations, the three items were each scored as 0 or 1, where 0 = *No smoking*, and all

other options earned a score of 1. The scores for these three questions were summed to create a composite score ranging from 0 – 3, with higher scores indicating more smoking. The variables were calculated, as described, then tested for internal consistency, finding adequate levels at year one, α = .66, as well as at year three, α = .72.

Data Analysis

All data were analyzed using IBM SPSS, version 21.0 (IBM Corporation, 2012). I tested structural models using a Structural Equation Model procedure following several steps. I created a measurement model to develop latent constructs of SES, Acculturative Stress, and Reserve Capacity. Reserve Capacity was hypothesized to be comprised of three indicator variables: Family Cohesion, Familism, and Fatalism, while SES was hypothesized to be comprised of Father's Level of Education, Mother's Level of Education, Room Ratio, Median Income Based on ZIP Code, Number of Computers at Home, Access to Internet at Home, Home Ownership, and whether or not the participant received Reduced Price Lunches. Acculturative Stress was hypothesized to include indicators of Spanish Competency Pressures, English Competency Pressures, Pressure to Acculturate, and Pressure against Acculturation. A list of these constructs and when they were measured appears in Appendix A. I used confirmatory factor analysis to determine the factor loadings and significance levels for each indicator of the three latent constructs. Once the measurement models were finalized, structural models were estimated. The hypothesized models are presented in Figures 2 and 3. Since alcohol use and smoking were likely to be correlated, their error terms were allowed to covary at years one and three in each analysis. Additionally, Acculturative Stress and Perceived Discrimination were each conceptualized as forms of stress and expected to correlate; thus, their error terms were allowed to covary

where possible (i.e., when each was an endogenous variable). All paths in Figure 2 were assumed to be invariant by sex. For Figure 3, many of the paths were hypothesized to have the same relationships for both males and females, and thus were planned to be constrained.

In order to evaluate the structural models' fits, a number of Goodness of Fit statistics were reviewed and are reported below, including χ^2, χ^2/degrees of freedom (df) ratio (CMIN), the Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). The χ^2 test compares the analyzed model with the variance/covariance data. A significant value for this test indicates that the analyzed model varies significantly from the data, and therefore a non-significant value reflects good fit (Byrne, 2010). However, large sample sizes tend to inflate χ^2 values, resulting in non-significant statistical values. Thus, it is important to use additional Goodness of Fit statistics. The χ^2/df ratio (CMIN) utilizes the same information, and also considers degrees of freedom, making the outcome less dependent on the sample size. A ratio ranging from 2.00 to 3.00 is considered acceptable fit (Wheaton, 1987). The CFI compares the hypothesized model to the tested model, taking into account covariance and sample size. Estimates greater than .95 indicate excellent model fit, with values greater than .90 indicating acceptable fit. The final goodness of fit index used, RMSEA, is a noncentrality parameter, where values closer to zero indicate better fit. Essentially, this statistic takes into consideration sample size, covariance, and the potential for model over-specification. Values less than .05 are considered good, values from .05 - .08 are considered acceptable, and values greater than .10 may reflect poor model fit (Kline, 2011). Previous researchers evaluating this data set found no significant variance between schools in outcome variables (alcohol use and smoking) with Intraclass Correlation

Coefficients all less than .01 (Wagner et al., 2010), and thus there was no need to test for school-level variance.

CHAPTER 4

RESULTS

Descriptive Statistics

Descriptive data for all demographic variables are shown in Table 1. Participants ranged in age from 12 – 16 years at year one of data collection. The majority of participants were 14 years old (85.1%), and female (53.3%). Most participants were born in the United States (87.6%). For those who chose to report their country of birth, not including the US, 160 participants indicated that they were born somewhere within the country of Mexico. Participants were allowed to self-identify as a member of multiple ethnicities within the study.

Next, composite variables were created and descriptive data were run for all study variables, including these composite variables. Missing data were evaluated for all study variables. In order to address skewness and kurtosis, z-scores were calculated to learn more about normality distributions. Using cutoffs of < -3.27 and > 3.27, 216 outliers were identified. This number did not reflect potential multivariate outliers, but rather outliers for each specific variable. Ranges, means, standard deviations, missing data information, and number of outliers can be seen in Table 2 for all study variables.

Based on the information provided in Table 2, maternal and paternal education each had substantial missing data, 26.6% and 32.9%, respectively. Based on this level of missing data, and the existing literature that supports adolescents are able to most accurately report tangible items reflecting SES (Andersen et al., 2008; Wardle et al., 2002), these variables

were excluded from the data set and subsequent analyses. Next, a total of 178 cases with outliers were removed from the data set, yielding the descriptive data reported in Table 3 (n = 1,386). Table 4 provides correlations between all continuous variables in the data set.

Outcome variables. In order to learn more about the variability in outcome variables, descriptive statistics were evaluated on smoking and alcohol use behaviors. At year one, 20.5% of participants report having smoked a cigarette. During the past 30 days, 99.1% of the sample indicated that they had smoked on "0 days," reflecting extremely low engagement in smoking behaviors during the past month at year one. Only two participants (0.1%) indicated that they had smoked every day of the past month. The CDC's online youth behavior survey (2011c) found that 41.1% of Hispanic American 9th grade students had tried smoking a cigarette, compared to 37.3% of African Americans, and 35.6% of European Americans. This indicates that smoking is perhaps less prevalent among participants in this study compared to the national population. Results indicate that at year three, 35.7% of participants reported that they had tried smoking cigarettes. However, 92% stated they had not smoked in the last 30 days. Approximately 4.2% of the sample reported smoking on a daily basis. Again, this is lower than rates documented by the CDC (2011b), which found that among 11th grade Hispanic American high school students, 52.9% had tried smoking, compared to 37.4% of African Americans and 47.3 of European Americans.

In evaluating alcohol use at year one of the study, 44.3% of the sample reported that they had consumed alcohol at some time during their lives. A total of 20.9% of the sample had consumed alcohol in the last 30 days, and 9.4% reported had consumed five or more drinks in a row during the past 30 days. These numbers are lower than those reported by the CDC (2011b), who found that 66.1% of Hispanic American 9th grade students had tried

alcohol before, compared to 58.1% of African Americans and 60.6% of European Americans. By year three, the majority of the sample, 67.1%, reported having tried alcohol at least once. However, 62% denied having any alcohol in the last 30 days. These results continue to reflect lower rates of consumption compared to the CDC sample, which found that 77.9% of Hispanic American 11th graders had tried alcohol, compared to 68.3% of African Americans and 76.1% of European Americans. Additional details on smoking and alcohol use variables can be found in Table. 5.

Descriptive Data Split by Sex. Several different predictions were made by sex (see Figure 3). Therefore, Table 6 provides demographic data by sex, Table 7 provides descriptive data for all study variables broken down by sex (after the removal of variables with substantial missing data and outliers), and Table 8 provides correlations between all continuous variables, with numbers on the top half of the table representing females and numbers on the bottom half representing males.

Confirmatory Factor Analysis to Create Measurement Models

Confirmatory factor analysis was used to construct latent variables of SES, Acculturative Stress, and Reserve Capacity. First, an SES measurement model with six indicator variables was estimated: Room Ratio, Median Income based on ZIP code, Home Ownership, Reduced Price Lunch, Number of Computers at Home, and Access to the Internet at Home (as discussed above, Maternal and Paternal Education were excluded on account of substantial missing data and questionable validity from adolescents' self-report of these variables in the literature). Because the variable 'Having Internet' significantly correlated with the variable 'Having Computers at Home,' the error terms associated with these two variables were allowed to covary. Second, a measurement model for the latent

variable of Acculturative Stress was estimated using four subscales: Pressure to Acculturate, Pressure against Acculturation, English Competency Pressures, and Spanish Competency Pressures. Third, a measurement model was estimated with the three variables associated with Reserve Capacity: Familism, Family Cohesion, and Fatalism.

In order to conserve degrees of freedom, the three latent constructs were estimated simultaneously within one confirmatory factor analysis. All indicator variables loaded significantly on the latent variables of SES and Acculturative Stress. However, none of the indicator variables (Familism, Family Cohesion, Fatalism) significantly loaded on the Reserve Capacity latent variable. Thus, these data do not suggest that a latent variable of Reserve Capacity should be used in the hypothesized model. The confirmatory factor analysis was re-estimated with only the SES and Acculturative Stress latent variables included, achieving adequate model fit: $\chi^2(33) = 150.03$, *CMIN* = 4.55, *CFI* = .92, *RMSEA* = .05. Details on factor loadings can be seen in Table 9, and Figure 4. Home Ownership was the strongest loading factor in SES ($\beta = .73$). The Ratio of Rooms per Person in the house was the next strongest loading factor ($\beta = .47$). Somewhat surprisingly, Pressure against Acculturation was the strongest loading factor for Acculturative Stress ($\beta = .80$), reinforcing the importance of using all four sub-scales in analyses with this variable.

Before model estimation, demographic variables were analyzed to determine which (if any) should be used as covariates within the models. Results showed no significant correlations between continuous variables (see Table 10). Additional *t*-tests were conducted to review the relationship between Sex and outcome variables (see Table 11). Results showed males ($M = .63$) were significantly more likely than females ($M = .41$) to engage in

smoking at year 3, $t(1117) = -4.36$, $p < .01$. Thus, Sex was held constant in the first set of analyses. In addition, Smoking and Alcohol Use at year one were used as control variables.

Structural Models to Test Hypotheses

SES models. Using the latent variables for SES and Acculturative Stress discussed above, structural models were estimated to test the hypothesized model depicted in Figure 2. Because a latent variable of Reserve Capacity could not be estimated, those three variables were included as indicators in the model. First, I began with SES at year one as my exogenous variable, including all pathways identified in Figure 2, and all three Reserve Capacity variables. Covariance paths were included between SES and the control variables (Smoking and Alcohol Use at year one and Sex). Results showed questionable overall model fit: $\chi^2(149) = 902.96$, *CMIN* = 6.06, *CFI* = .75, *RMSEA* = .06.

Hypothesis 1 predicted direct, negative relationships between SES at Year 1 and Smoking and Alcohol Use at Year 3 (controlling for Year 1 levels). However, results showed non-significant paths between both SES and Smoking ($\beta = .04$) and Alcohol Use ($\beta = .04$). Hypothesis 2 predicted mediation of the SES, Smoking, and Alcohol Use relationships by Acculturative Stress, Perceived Discrimination, Reserve Capacity variables, and Symptoms of Depression (with the direction of specific pathways depicted in Figure 2). Contrary to expectations, SES was positively associated with Perceived Discrimination ($\beta = .08$), negatively related to Fatalism ($\beta = -.08$), and un-related to Familism ($\beta = -.07$), Family Cohesion ($\beta = -.02$), and Acculturative Stress ($\beta = .002$). As predicted, Perceived Discrimination was negatively related to Familism ($\beta = -.11$) and Family Cohesion ($\beta = -.16$), and positively associated with Symptoms of Depression ($\beta = .24$). However, Perceived Discrimination was not related to Fatalism ($\beta = .05$). Contrary to predictions, Acculturative

Stress was not related to Familism (β = -.05), Family Cohesion (β = .004), or Fatalism (β = .004). However, it was positively related to Symptoms of Depression (β = .08) as expected. Two of the three Reserve Capacity variables significantly predicted Symptoms of Depression. Family Cohesion was negatively associated with Depressive Symptoms (β = -.24), whereas Fatalism was positively associated with Depressive Symptoms (β = .13). Familism was un-related to Symptoms of Depression (β = -.01). In turn and as predicted, Symptoms of Depression were positively related to both Smoking (β = .14) and Alcohol Use (β = .12) at year three.

Results showed that the total effect of SES on Smoking was .038, while the indirect effect via the mediators was .002. Therefore, the indirect effect via the mediators explained 5.3% of the total effect. Results also showed that the total effect of SES on Alcohol Use was .038, while the indirect effect via the mediators was .002. Therefore, the indirect effect via the mediators again explained 5.3% of the total effect. The model (including control variables) accounted for 13% of the variability in Smoking and 7% of the variability in Alcohol Use. Details about this model are in Table 12, and Figure 5.

After reviewing this initial model, it was clear that Acculturative Stress did not function as hypothesized. It was not significantly predicted by SES, nor did it significantly predict the Reserve Capacity variables. Since it did not function as a mediator as hypothesized, and in an effort to improve model fit, this variable was eliminated from the model. A new model was estimated using the same pathways identified in Figure 2, including all three Reserve Capacity variables, but removing Acculturative Stress. Covariance paths were included between SES and the control variables (Smoking and

Alcohol Use at year one and Sex). Results showed somewhat improved overall model fit: $\chi^2(88) = 484.62$, *CMIN* = 5.51, *CFI* = .78, *RMSEA* = .06.

Hypothesis 1 predicted direct, negative relationships between SES at Year 1 and Smoking and Alcohol Use at Year 3 (controlling for Year 1 levels). However, as with the previous model, results showed non-significant paths between both SES and Smoking (β = .04) and Alcohol Use (β = .04). Hypothesis 2 predicted mediation of the SES, Smoking, and Alcohol Use relationships by Perceived Discrimination, Reserve Capacity variables, and Symptoms of Depression (with the direction of specific pathways depicted in Figure 2). Mediation results of this trimmed model replicate the findings reported above from the full model. Contrary to expectations, SES was positively associated with Perceived Discrimination (β = .08), negatively related to Fatalism (β = -.08), and un-related to Familism (β = -.07) and Family Cohesion (β = -.02). As predicted, Perceived Discrimination was negatively related to Familism (β = -.12) and Family Cohesion (β = -.16), and positively associated with Symptoms of Depression (β = .26). However, Perceived Discrimination was not related to Fatalism (β = .06). Two of the three Reserve Capacity variables significantly predicted Symptoms of Depression: Family Cohesion was negatively associated with Depressive Symptoms (β = -.24), whereas Fatalism was positively associated (β = .13). Familism was un-related to Symptoms of Depression (β = -.02). In turn and as predicted, Symptoms of Depression were positively related to both Smoking (β = .14) and Alcohol Use (β = .12) at year three.

Results showed that the total effect of SES on Smoking was .038, while the indirect effect via the mediators was .002. Therefore, the indirect effect via the mediators explained 5.3% of the total effect. Results also showed that the total effect of SES on Alcohol Use was

.038, while the indirect effect via the mediators was .003. Therefore, the indirect effect via the mediators explained 7.9% of the total effect. The model (including control variables) accounted for 13% of the variability in Smoking and 7% of the variability in Alcohol Use. Details about this model are in Table 13, and Figure 6.

In sum, there was no support for hypothesis 1, as the relationships between SES and the outcome variables were not significant. I found partial support for hypothesis 2. In particular, SES seemed to affect the outcome variables indirectly via the following process: Discrimination → Family Cohesion → Symptoms of Depression → Smoking and Alcohol Use. That is, results suggest SES positively predicts Perceptions of Discrimination, which is negatively related to Family Cohesion, which is negatively related to Symptoms of Depression, which predict increased Smoking and Alcohol Use.

Acculturation models. After analyzing the hypothesized models related to SES, I constructed my exploratory model related to Acculturation. Before testing for any gender differences, I estimated a model that held sex constant. As with the previous models, the lack of a latent Reserve Capacity variable necessitated running a model that included indicators of Familism, Family Cohesion, and Fatalism. For this model, I began with Acculturation at year one as my exogenous variable, where SES was held constant. This model included all pathways identified in Figure 3, with individual variables of Familism, Family Cohesion, and Fatalism replacing the hypothesized latent variable of Reserve Capacity. Covariance paths were included between Acculturation and the control variables (Smoking and Alcohol Use at year one and SES). Results revealed questionable overall model fit: $\chi^2(151) = 784.00$, *CMIN* = 5.19, *CFI* = .78, *RMSEA* = .06. Individual path coefficient results are presented below.

First, contrary to predictions, Acculturation was unrelated to the outcome variables: Smoking (β = -.04) and Alcohol Use (β = .003) at year three. In addition, Acculturation was unrelated to both Perceived Discrimination (β = -.05) and Acculturative Stress (β = -.04). It had mixed associations with the Reserve Capacity variables: positively related to Familism (β = .11), negatively related to Fatalism (β = -.08), and un-related to Family Cohesion (β = .004). As predicted, Perceived Discrimination was negatively related to Familism (β = -.11) and Family Cohesion (β = -.16), but was un-related to Fatalism (β = .03). Also as predicted, Perceived Discrimination was positively related to Symptoms of Depression (β = .23). Although Acculturative Stress was positively associated with Symptoms of Depression (β = .08), the other predictions involving it were not supported, as it was un-related to Familism (β = -.03), Family Cohesion (β = .02) and Fatalism (β = .04). Among the Reserve Capacity variables, Family Cohesion was negatively associated with Symptoms of Depression: (β = -.24), whereas Fatalism was positively associated (β = .13) and Familism was un-related (β =-.01). Finally, as predicted, Symptoms of Depression were positively related to both Smoking (β = .12) and Alcohol Use (β = .12) at year three.

Results showed that the total effect of Acculturation on Smoking was -.038, while the indirect effect via the mediators was -.004. Therefore, the indirect effect via the mediators explained 10.5% of the direct effect. Results also showed that the total effect of Acculturation on Alcohol Use was -.001, while the indirect effect via the mediators was -.004. Therefore, the indirect effect via the mediators explained 25% of the direct effect. The model (including control variables) accounted for 11.2% of the variability in Smoking and 6.8% of the variability in Alcohol Use. Details about this model are in Table 14, and Figure 7. In sum, the hypotheses related to Acculturation were not supported: it did not

predict either form of stress within the Reserve Capacity Model, and was un-related to either outcome. Based on these findings, testing the model for differences by sex seemed unwarranted.

CHAPTER 5

DISCUSSION

The purpose of this study was to test the RCM with culturally relevant variables to predict adolescent smoking and alcohol use behaviors. Previous researchers have used the RCM mostly among adults in an effort to understand the links between poverty, stress, reserve capacity, emotions, and health outcomes (i.e., Brondolo et al., 2008; Schöllgen et al., 2011). Other studies have found support that acculturation and acculturative stress are unique, culturally-relevant variables that may contribute to health behaviors such as alcohol use (i.e., Caetano et al., 2008). Results of this study indicate mixed findings.

Findings

I hypothesized that SES at year one would have a direct and negative relationship with Alcohol Use and Smoking at year three (controlling for year one levels). This hypothesis was not supported, as the relationships between SES and the outcome variables were non-significant. The next hypotheses predicted that Perceptions of Discrimination, Acculturative Stress, culture specific reserves (Familism, Family Cohesion, and Fatalism), and Symptoms of Depression would partially mediate the association between SES and Alcohol Use and Smoking. As was noted in the results section, Acculturative Stress was not significantly related to any of the other variables, except Symptoms of Depression, and thus it was eliminated from the model. Results provide partial support to the other mediators, as Perceived Discrimination was predictive of Family Cohesion, which in turn predicted Symptoms of Depression.

Contrary to predictions, SES was unrelated to the outcome variables of Smoking and Alcohol Use. Although past research has shown that SES is negatively related to unhealthy behaviors, no evidence of this association was found. This may have been the case for two reasons. First, the scales used to quantify smoking and alcohol use were skewed, reflecting a large number of students who reported never having smoked a cigarette or used alcohol in the past 30 days, or in their lifetimes. In fact, the proportion of students who engaged in smoking and alcohol use behaviors was lower within this sample than has been found in other similar samples (CDC, 2011c). This lack of variability could help explain why SES was not significantly associated with the outcome variables. Second, we could have encountered a floor-effect dealing with a low-income sample. Additional analyses based on ZIP codes from school (school names are being kept anonymous) revealed that median annual income ranged from $30,029 - $48, 927. Third, research suggests that living in poverty may lead to feelings of oppression, which is one reason why individuals may engage in poor coping behaviors, such as smoking in drinking (Rose & Hatzenbuehle, 2009). It is important to consider that these data were collected from schools which represent specific districts or neighborhoods. It may be that students living in a specific school district have similar levels of income, and do not feel marginalized by their SES. Other research has found that SES's impact on health differs at specific levels. For example, Schöllgen and colleagues (2011) found that SES had no impact on subjective health for individuals in the low and medium levels of income. Thus, it is possible that SES may not have varied sufficiently to impact health behaviors within this sample.

An interesting finding from this study was that SES was positively related to Perceived Discrimination, suggesting that as SES increases, so do levels of Perceived

Discrimination. There are a few possible explanations for this phenomena, particularly among Hispanic Americans. First, at the lowest levels of SES, Hispanic Americans may interact less with European Americans and have less of an opportunity to experience discrimination. For example, Iceland and Wilkes (2006) found significant patterns of segregation among Hispanic Americans, based on income, poverty, education, and occupation. Thus, at the lowest levels of SES, Hispanic Americas are more likely to live and work around other individuals of the same race and ethnic backgrounds. Additionally, very low SES Hispanic Americans may represent less acculturated individuals, who may not speak or understand English necessary to perceive some instances of discrimination. Viruell-Fuentes (2007) found that first generation and recent immigrants may not understand that they are "minorities," based on their limited interactions with European Americans, African Americans, or other ethnic groups. They perceived their treatment by others to be positive and reported lower levels of perceived discrimination. In contrast, second generation immigrants, who had higher levels of SES (i.e., education and income), reported higher levels of discrimination. This is consistent with the results of the present study, where schools targeted for participation had approximately 70% Hispanic American student enrollment rates. It is possible that teachers in these schools are more culturally sensitive, better trained in multicultural issues, or conscious of their social behavior. This adds to the literature by suggesting that there may not be a continuous relationship between SES and discrimination, but rather an interaction that varies with culture.

The strongest evidence in support of the cognitive-emotional predictions of the RCM came from the trimmed model of SES (after removal of Acculturative Stress). Specifically, Perceived Discrimination was negatively related to Family Cohesion, which in turn was

positively associated with Symptoms of Depression. Additionally, Symptoms of Depression were positively related to Smoking and Alcohol Use. Thus, the experience of discrimination outside the home seems to break down family bonds, which in turn has a negative effect on mental health. It is possible that experiences of perceived discrimination are processed at home with family members, but instead of providing comfort, these interactions result in heightened family conflict, thereby decreasing cohesion. In turn, low family cohesion may be a stressor that elicits maladaptive coping behaviors in adolescents, including smoking and alcohol consumption. Previous research has supported that family cohesion mediates the relationship between stress and mental health. For example, Jair, White, Roosa, and Zieders (2013) found that perceived discrimination led to decreased mental health among Mexican Americans adolescents, and that this relationship was partially mediated by family cohesion. Other studies, such as one by Juang and Alvarez (2010), found that perceived discrimination led to increased loneliness, anxiety, and somatization among Chinese American adolescents. This study also found that family cohesion moderated these relationships.

In addition, prior research supports the documented positive relationship between distress and poor health behaviors. For example, Tran et al. (2010) found that increased perceptions of discrimination led to increased binge drinking for Hispanic American adolescents. Borrell et al. (2010) found that perceived discrimination was associated with increased smoking and alcohol use among Hispanic Americans as well as African Americans. Further, research has supported the link between symptoms of depression and poor health behaviors. Audrain-McGovern et al. (2009) found that adolescents who endorsed a greater number of depressive symptom were more likely to smoke cigarettes. Additional researchers have demonstrated that within a predominately European American sample of

high school students, those who endorsed greater symptoms of depression were more likely to use alcohol and smoke cigarettes (Diego, Field, & Sanders, 2003). Thus, this project adds to the existing literature, demonstrating that perceived discrimination is a specific form of stress that erodes family cohesion, and can lead to symptoms of depression as well as negative health behaviors among Hispanic American adolescents.

As discussed above, Acculturative Stress was unrelated to the other variables in the study. These results suggest that this was not a relevant form of stress for this sample of Hispanic American adolescents. One reason for this may be because the sample came from schools where a majority of students endorsed Hispanic ethnicity. Part of the stress of acculturation comes from being marginalized or pressured to adopt cultural practices of the mainstream, or to reject your family's cultural practices (Schwartz et al., 2010). It is possible that participants from this study represent the dominant culture of their schools, and thus do not perceive the stress of acculturation found in other samples.

This study conceptualized Fatalism as a cultural resource—a protective variable for Hispanic American adolescents during times of stress. However, Fatalism did not function as hypothesized by the RCM. In fact, Fatalism positively predicted Symptoms of Depression, meaning that as fatalism scores increased so did distress. Thus, Fatalism did not protect adolescents from negative emotions. In evaluating the questions used in the scale, the questions reflected beliefs similar to pessimism or external locus of control (Joiner et al., 2001). If we consider Fatalism within this sample of Hispanic American adolescents as analogous to the mainstream American cultural value that lack of control is distressing (Espinosa de los Monteros & Gallo, 2011), then it is consistent with literature that connects fatalism to negative health outcomes (Ross & Mirowsky, 2013).

An exploratory structural model was estimated to test Acculturation's impact on health behaviors. From a basic level, the construct of Acculturation did not function as I predicted in multiple capacities. To review, I hypothesized Acculturation would predict Alcohol Use and Smoking, when it was not related to either outcome variable. I also hypothesized that Acculturation would be positively related to Perceived Discrimination and Acculturative Stress; it was unrelated to either variable. Next, I predicted that Acculturation would be negatively related to Familism, Family Cohesion, and Fatalism. Results showed that Acculturation was positively related to Familism, negatively related to Fatalism, and unrelated to Family Cohesion. It is possible that these inconsistent results are a function of the way I operationalized and tested Acculturation. Based on theory and past research, I used one subscale within the Acculturation measure that reflected levels of US cultural values and customs adopted by participants. This decision was based on research showing that greater US acculturation leads to increased use of alcohol and smoking behaviors (i.e., Abraído-Lanza, Chao, & Flórez, 2005; Schwartz et al., 2011). It is possible that this subscale did not adequately measure the construct. Some researchers suggest that including multiple dimensions of acculturation or cultural identity is important to adequately measure this construct (i.e., Lara et al., 2005; Oetting, Swaim, & Chiarella, 1998). It is also possible that by not including the retention of Mexican cultural values I did not adequately capture acculturation. For example, Schwartz et al. (2013) found that adoption of American culture did not have a negative impact on health behaviors as long as the individual also retained customs and values associated with her family's Hispanic cultural identity.

Strengths

This project has a number of notable strengths. First, the present study is the first to test the RCM among Hispanic American adolescents, and to emphasize culture-specific reserves (familism, family cohesion, and fatalism), and thus, meaningfully, adds to the literature. Second, one of the greatest strengths of this project is the longitudinal design. The RCM presumes that stress impacts individual reserves over a period of time, which leads to changes in health behaviors. This project allows for causal inferences to be made from results. Third, this data set includes information from over 2,000 students. The sample size allows for complex analyses to be conducted, and the inclusion of multiple measures allow for researchers to test multiple hypotheses. Fourth, researchers took great measures to locate students who transferred to schools within the district and allowed them to continue to participate in the project (Unger et al., 2009b). These steps yielded a sample that was relatively low in attrition, increasing its generalizability. Fifth, the questionnaire was provided in written format in Spanish and English languages, and was read aloud by researchers in both English and Spanish. These efforts reduced the possibility of participants not engaging in the research project based on language or literacy concerns.

Limitations

As with any research endeavor, a number of potential limitations are noteworthy. First, this project used an archival data set that was part of a larger research project. There are certainly limitations to using previously collected data. Principally, because I did not design this study, I had no control over the measures used, or the manner of assessment. Second, all measures were completed using paper and pencil formats, which introduced the potential for shared method variance. In the same manner, acquiescence bias can develop

from individuals who tend to give the same responses to questions without thoroughly reading the question. Third, the lack of objective measures of smoking or alcohol use is a limitation because students may under-report based on fear that their parents will be informed of their individual use characteristics, or be inaccurate based on socially desirable responding. Also, social desirability may have threatened the integrity of responses related to multiple scales, including perceived discrimination, alcohol use, smoking, etc. However, other researchers have found a high level of consistency between self-reported use of substances and biological measures among Hispanic American adolescents (Dillon, Turner, Robbins, & Szapocznik, 2005).

Fourth, it also is important to note that this sample is from one city in the US, and does not reflect the culture or values of all Hispanic American adolescents. It is quite possible that adolescents living in different regions may perceive their daily stressors differently. In addition to participants all living in the same school district, 71.1% of participants identified their ethnic identity as Mexican American, while only 6.7% self-identified as Central Americana, and 3% self-identified as being South American. Thus, results of this study cannot reasonably be generalized to all Hispanic American adolescents, nor can they generalize to other minority adolescents. Future studies should consider replicating this project in multiple areas throughout the US. Fifth, asking for adolescents to provide information to determine their SES is difficult, since they may not know about concepts such as home ownership. It is noteworthy that variables which were determined to be difficult for adolescents to estimate were eliminated prior to analysis (i.e., parental education), in an effort to improve the integrity of the results. However, it is important to consider that this abstract concept may have been difficult for some students to report. Sixth,

a lack of variability on the outcome measures (smoking, alcohol use) necessitated the use of a collapsed scale. While this has been done by other researchers (i.e., Lorenzo-Blanco et al., 2011; Wagner et al., 2010), it would have been preferable to use the full Likert scale and compare differences along the continuum. Seventh, this study did not include or control for other variables associated with adolescent smoking or alcohol use, such as peer or parent smoking or alcohol use. Previous research has demonstrated adolescents' choices to use alcohol and smoking are correlated with the decisions made by their peers and whether or not their parents use or condone use of these substances (Ramirez & Hinman, 2012; Weden & Miles, 2012). These variables are available within the Project Red data set, and could be tested in the future.

Potential Implications

Despite these limitations, there are a variety of possible implications from this project. This is the first research study to integrate culturally-relevant stress and support variables among adolescents using the RCM. The results of the current study illustrate the role that parents or extended family could play in the prevention of alcohol use and smoking among Hispanic American adolescents, particularly when considering family cohesion. For example, the *Familias Unidas* intervention (Pantin et al., 2003) focuses on increasing parental investment, which is operationalized as positive parenting, parental involvement, and family support, in Hispanic immigrant families. One of the goals of the intervention is to decrease adolescent behavior problems. When evaluating the efficacy of the intervention, results showed that increasing parental investment led to reduced behaviors that were seen as destructive to oneself or others. Taking this example along with the results of the current

study, it is possible that an intervention to improve family cohesion might lead to reduced symptoms of depression and risky health behaviors among adolescents.

Social debate and research continue to support the importance of reducing poverty in order to improve health outcomes (Grantmakers in Health, 2009). The same is true for the need to reduce discrimination in society, as it exists from the highest levels of institutions, to the lesser forms of individual discrimination (van Ryn & Fu, 2003). These are important and necessary goals; however, the likelihood of eliminating poverty and discrimination is unknown. There are many barriers, both political and social, that may prevent these goals from ever being completely accomplished. My study suggests that we do not have to eliminate these major issues to make a difference in health outcomes. In evaluating the construct of reserve capacity, we see that familism and family cohesion function as buffers to symptoms of depression. Thus, we can potentially reduce adolescent smoking and use of alcohol by targeting depression, and encouraging family cohesion and familism. Using this information, we could design culturally sensitive interventions that would target stress management strategies, negative emotions, and coping behaviors at the school-level. For example, the "Stress-Busters" intervention (Rosenbaum Asarnow, Scott, & Mintz, 2002) found that a family education intervention was successful at reducing depressive symptoms and poor coping behaviors among 6^{th}-8^{th} grade students. The current research project could inform interventions, such as this one, to be implemented with Hispanic high school students.

Results of this study may stimulate the development of culturally competent interventions to prevent smoking and alcohol use among Hispanic American adolescents. For example, the "*keepin' it REAL*" prevention project has been recognized by the Substance Abuse and Mental Health Services Administration as a model program. This intervention

focuses on the prevention of alcohol, tobacco, and substance use among multicultural middle schools (Marsiglia, Ayers, Gance-Cleveland, Mettler, & Booth, 2012). The intervention specifically discusses cultural values that support anti-drug use behaviors, such as collectivism and social support, and encourages participants to be a resource to others. The intervention also discusses acculturative stress and racial discrimination openly as forms of stress that participants will have to face, and which could lead to drug use. In evaluating the efficacy of the study, students who engaged in the *keepin' it REAL* project were significantly less likely to consume alcohol than students who did not attend, and were also matched on demographic characteristics.

Future Research

This research project leaves some questions unanswered, and leads to ideas for other research projects. Specifically, studies should consider testing multiple dimensions of acculturation, and perhaps constructing latent variables to represent these dimensions simultaneously. Perceived discrimination and acculturative stress, while both stressors, have different impacts on health. For example, research suggests that perceived discrimination is a sudden, uncontrollable, and even traumatic form of stress (Flores, Tschann, Dimas, Pasch, & de Groat, 2010). In contrast, acculturative stress is more consistent, but more controllable and even potentially resolvable (Berry, 2006). Previous research suggests that perceived discrimination may actually predict acculturative stress, or that acculturative stress may mediate the relationship between perceived discrimination and health outcomes (Pascoe & Smart Richman, 2009; Torres et al., 2012). In reviewing the results of the present study, perhaps the model would have fit better if perceptions of discrimination were used to predict acculturative stress, as has been previously supported. Future research may also evaluate the

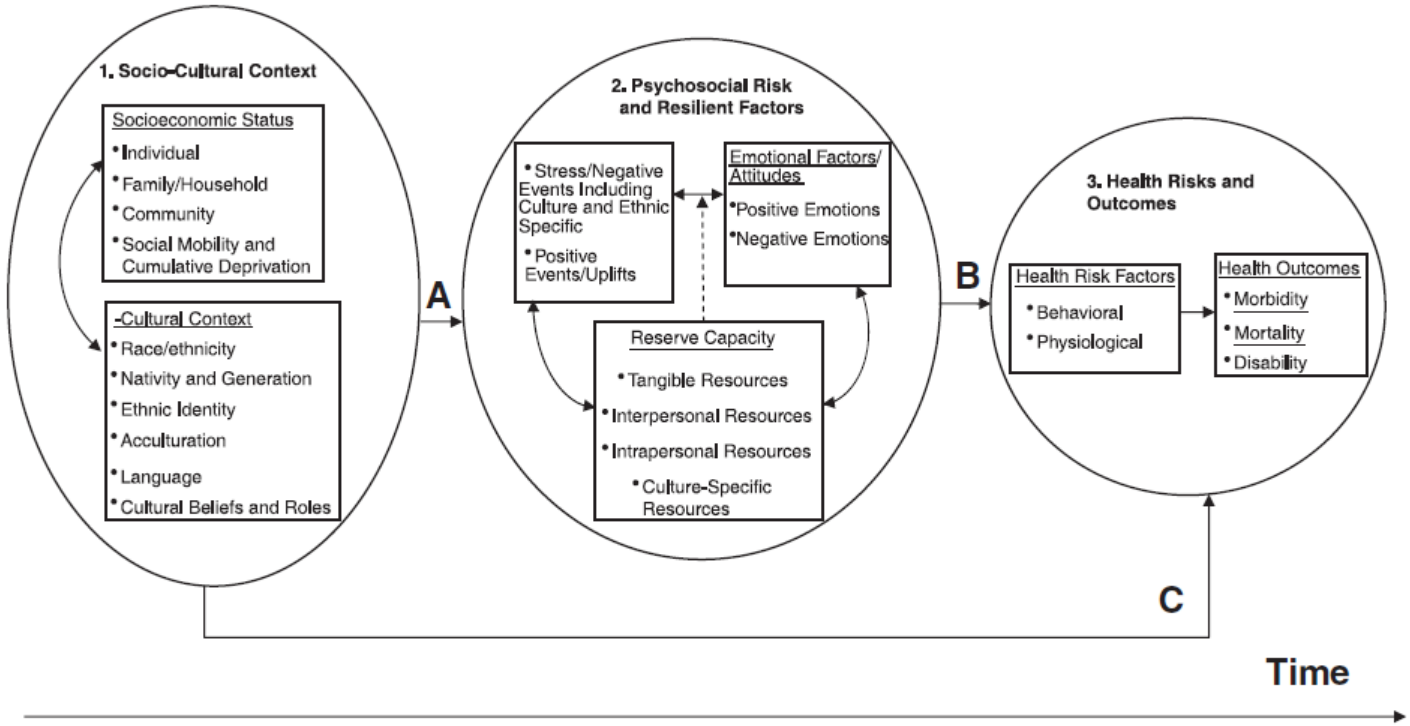
RCM using objective measures of health. For example, research has found that exposure to discrimination can increase ambulatory blood pressure (Richman et al., 2010). This study could be replicated with a variety of different outcome variables including variables not related to health, such as academic achievement, bullying, or other behaviors of importance during adolescence. Additionally, future research that could evaluate the RCM using a sample including both African Americans and Hispanic Americans simultaneously would allow for additional inferences to be drawn. This would allow researchers to test for differences between these groups, in addition to seeing how the entire sample is impacted by the variables tested within this study.

Future research also should consider using other measures of culturally-specific reserve capacity variables to evaluate how they relate to discrimination, acculturation, negative emotion, and health behaviors. For example, Ojeda and Piña-Watson (2013) found that spirituality served as a protective factor against the effects of perceived discrimination among a sample of Hispanic American males. Whereas familism, family cohesion, and fatalism were theoretically suitable to represent reserve capacity, I was unable to create a latent variable which represented the concept. Some researchers would propose the family-level variables are best reflected when they are measured with both children and parents (Schwartz et al., 2013). Thus, future research may benefit from including information on how parents perceive family-related constructs.

Finally, as was discussed in the implications section, researchers should seek to evaluate if health behaviors among Hispanic Americans adolescents can be improved by addressing their perceptions of stress, negative emotions, and reserve capacity. An intervention targeting these specific areas could elucidate whether this path is reversible. It is

possible that interventions that target Hispanic American children can foster emotional and cultural reserves, before perceptions of discrimination become salient. Health professionals could play an essential role in identifying symptoms of depression, and making referrals for treatment before poor coping strategies and health behaviors occur. While the mechanisms of implementing change based on my findings are broad, the larger picture is that we have an opportunity to make positive changes for individuals at risk for developing chronic health conditions based on poor choices related to use of alcohol and smoking.

Figure 1. Revised RCM with Cultural Constructs



From "Resiliency in the face of disadvantage: Do Hispanic cultural characteristics protect health outcomes?" by L. C. Gallo, F. J. Penedo, E. Espinosa de los Monteros, and W. Arguelles, 2009, *Journal of Personality, 77(*6), 1707 – 1746. © John Wiley and Sons 2009. Reprinted with permission.

Figure 2. Hypothesized Model testing the Effect of SES on Health Behaviors

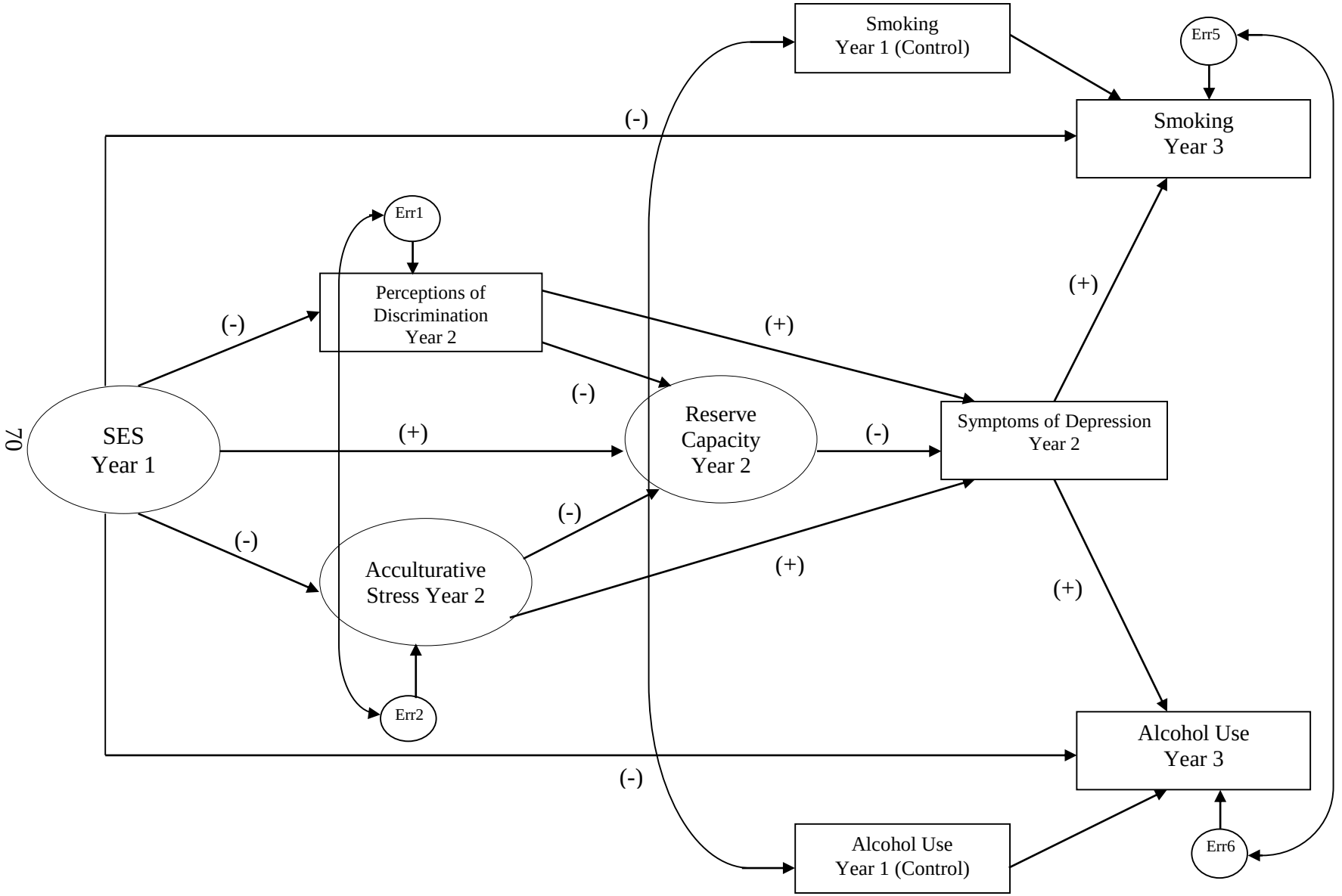


Figure 3. Exploratory Model for Adolescents Examining the Effect of Acculturation on Health Behaviors

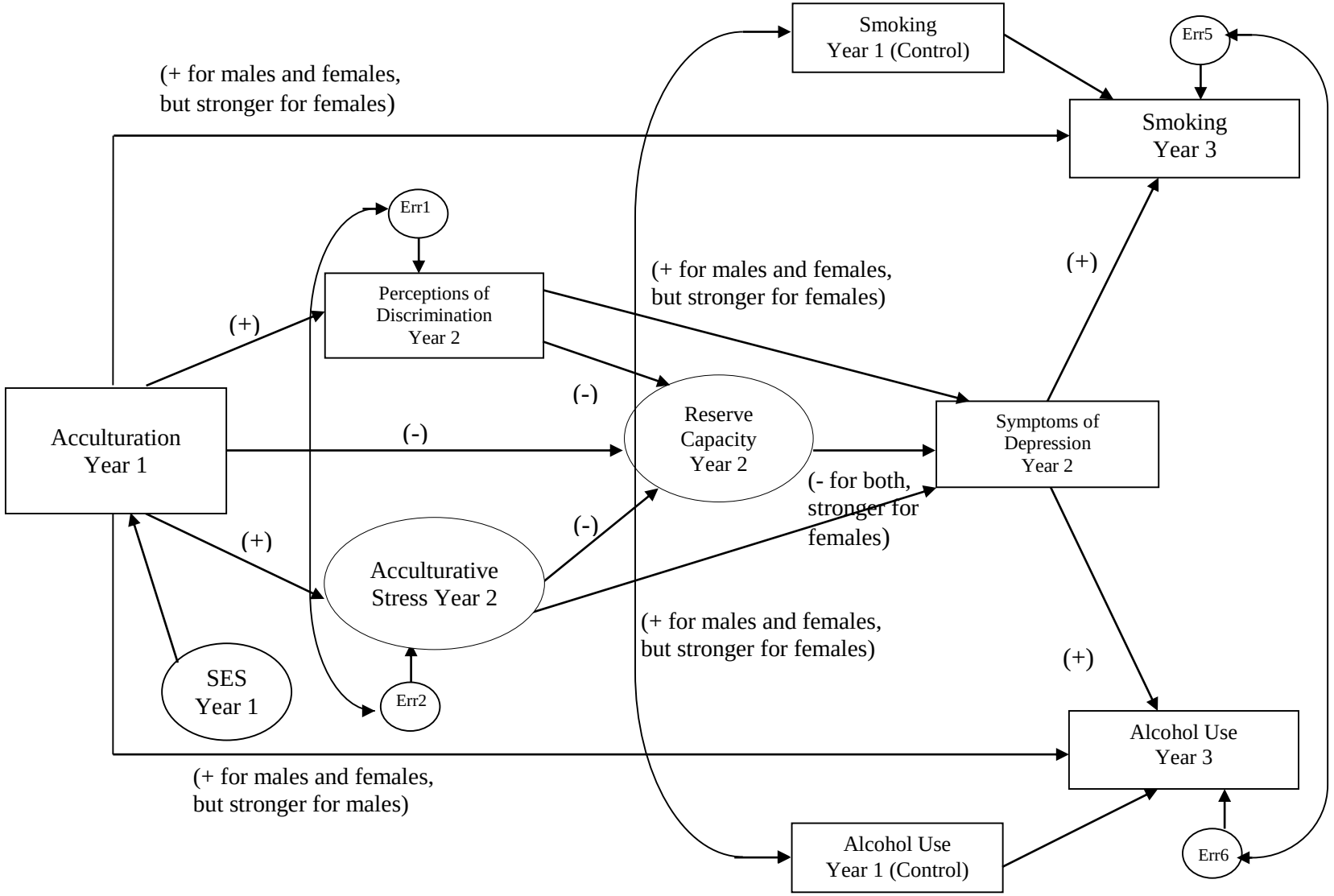
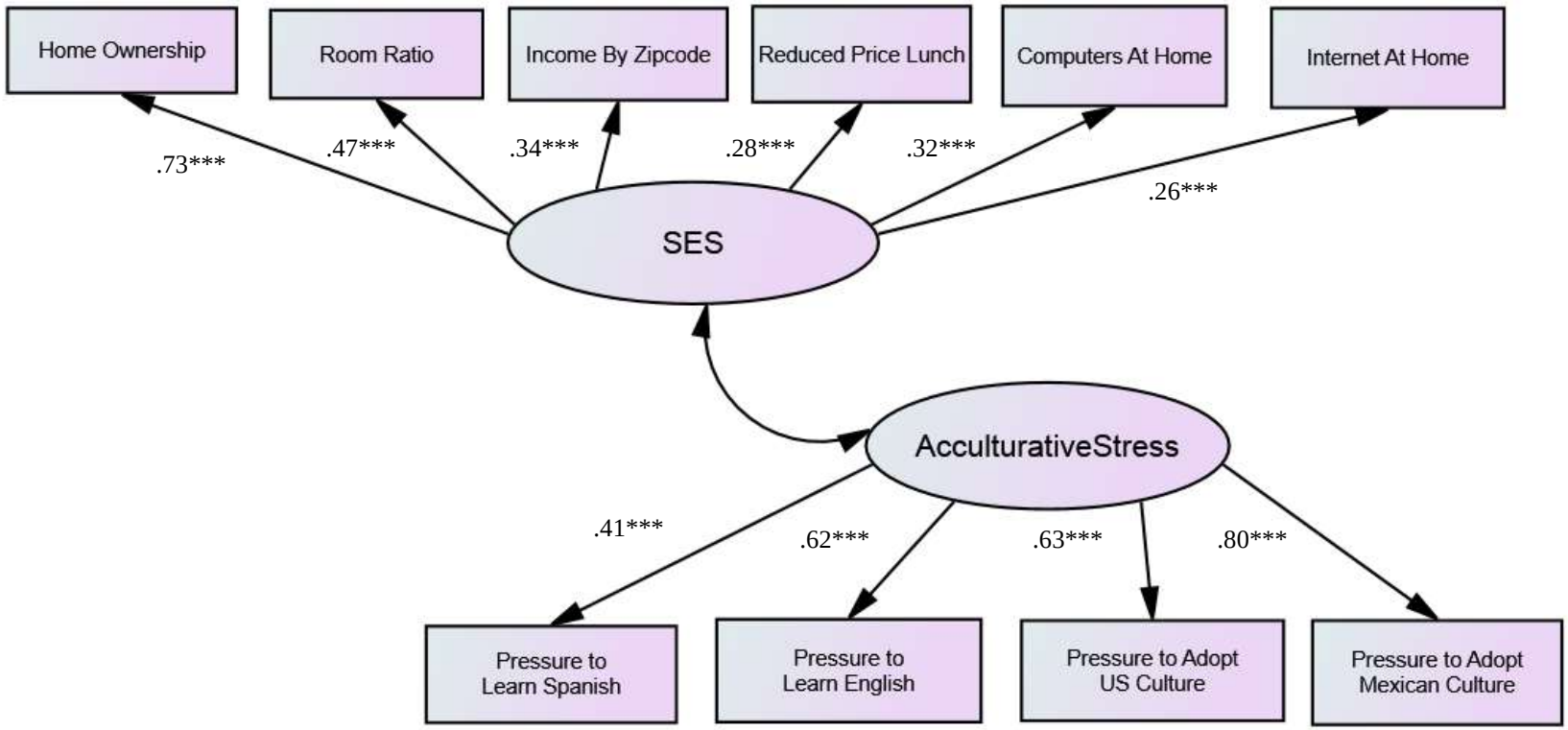
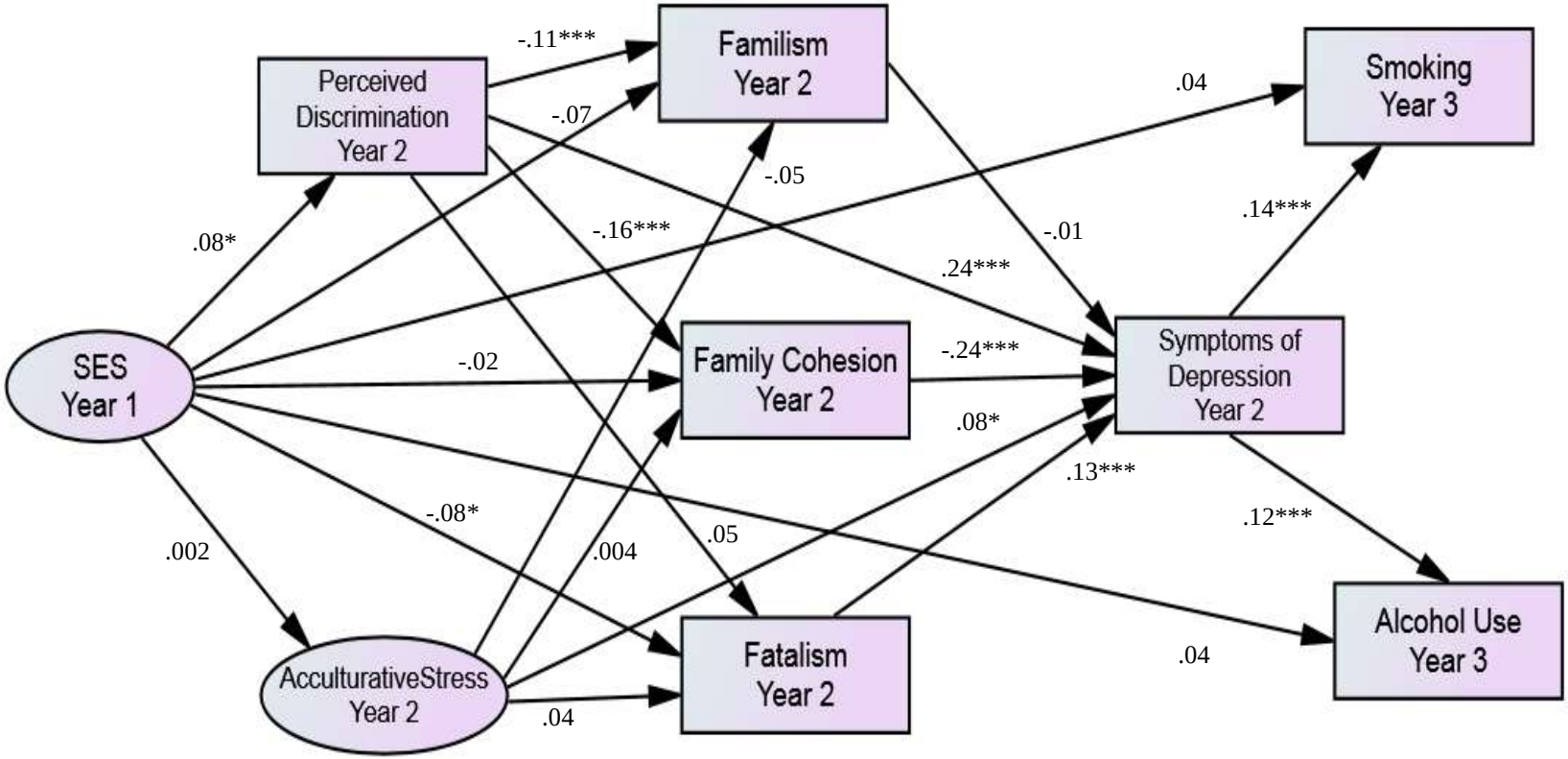


Figure 4. Confirmatory Factor Analysis Results for SES and Acculturative Stress Latent Variables



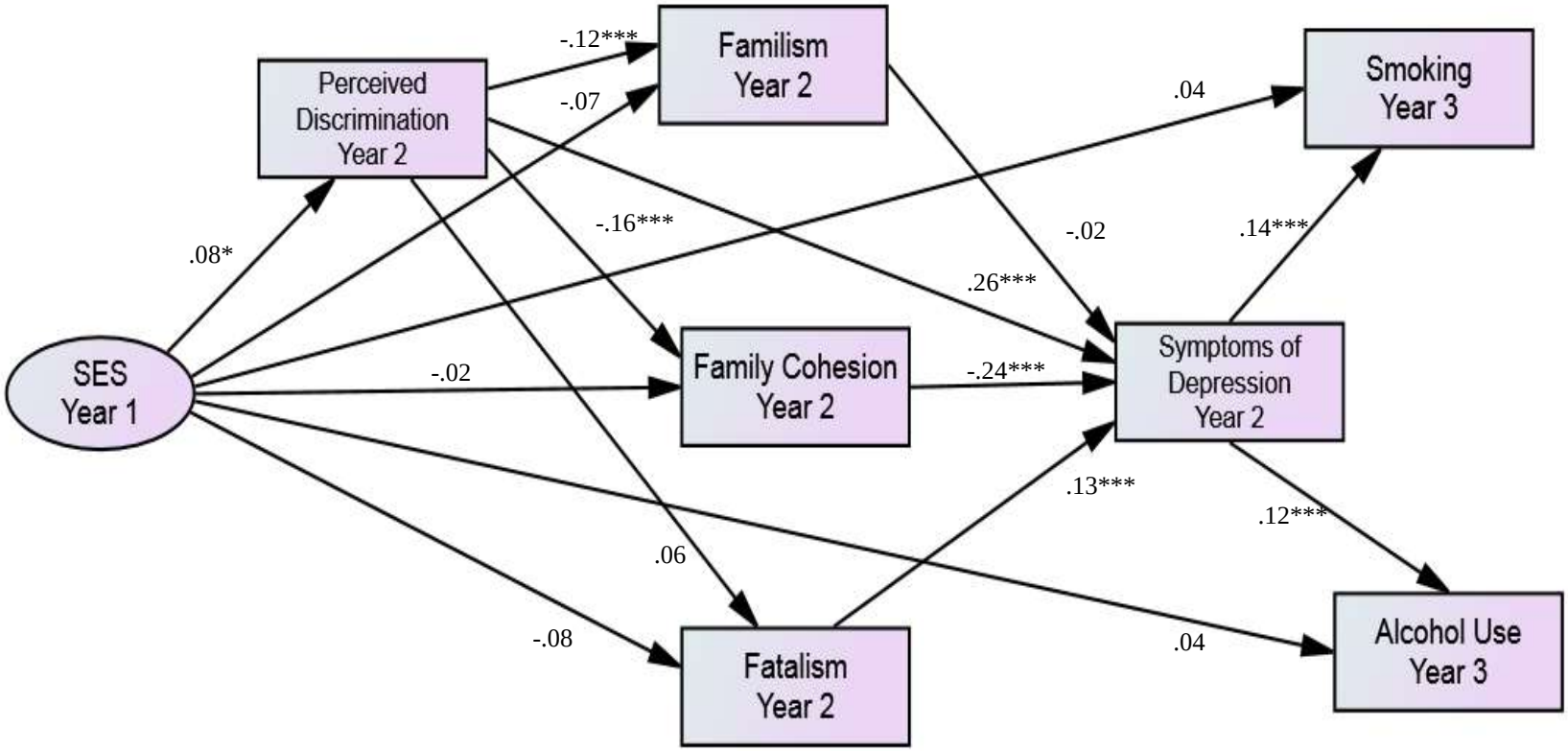
***$p < .001$

Figure 5. RCM Model with SES



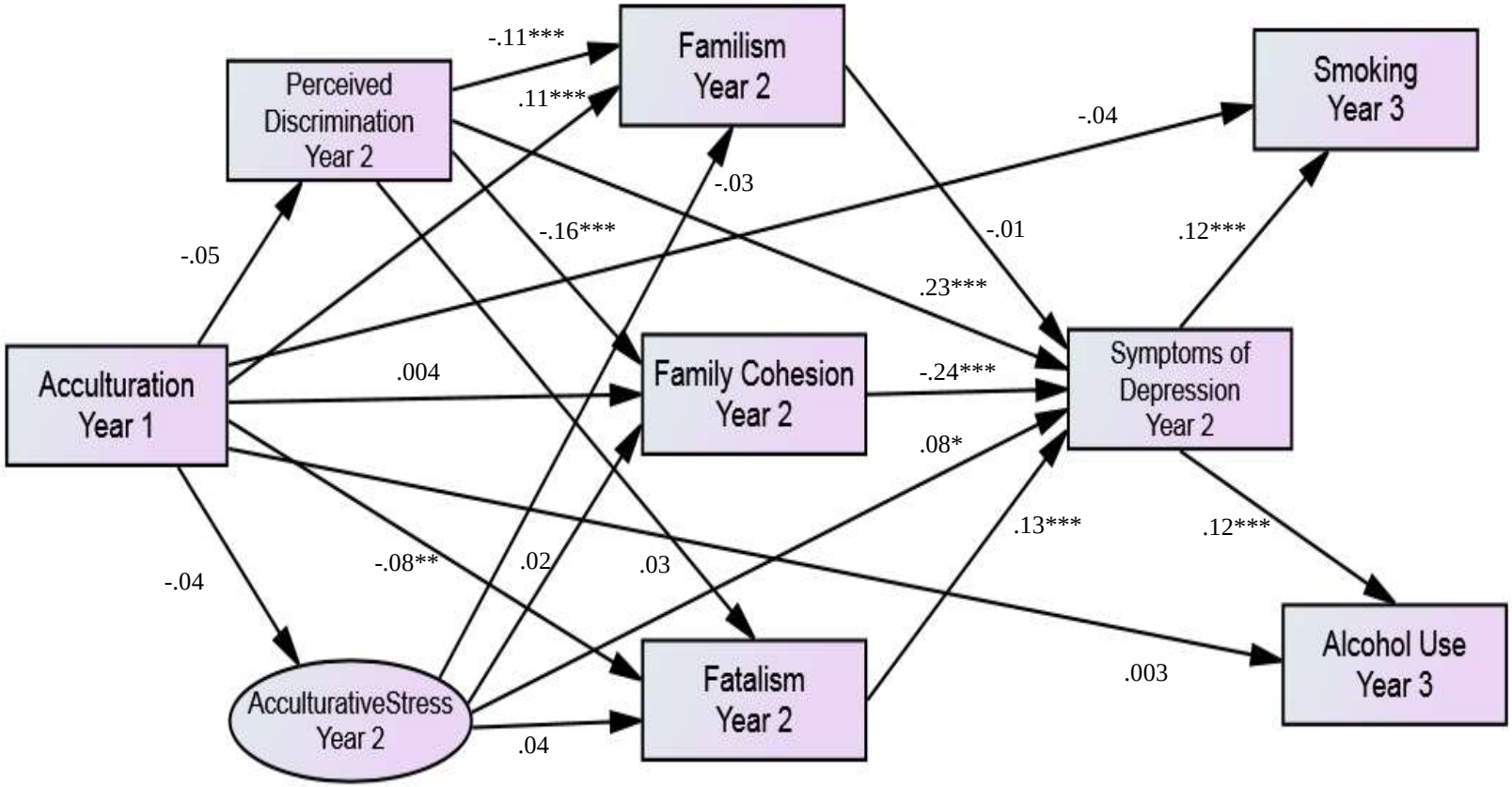
*$p < .05$; **$p < .01$; ***$p < .001$

Figure 6. RCM Model with SES without Acculturative Stress



$p < .05$; $^{**}p < .01$; $^{***}p < .001$

Figure 7. RCM Model with Acculturation



$p < .05$; $^{**}p < .01$; $^{***}p < .001$

Table 1: Participant Demographic Data

Variable Name	Frequency	Valid Percent
Sex		
Female	819	53.5
Male	711	46.5
Age		
12	1	0.1
13	120	7.7
14	1323	85.1
15	108	6.9
16	3	0.2
Birth Country		
US	1325	87.6
Other	187	12.4
Ethnic Identity		
American Indian/Alaska	19	1.7
Asian	14	1.3
Black/African American	25	2.3
Hispanic	790	65.5
Latino	722	65.1
Native Hawaiian	12	1.1
White	82	7.6
Mexican	837	70.1
Central American	72	6.7
South American	32	3.0
Mexican American	872	71.1
Chicano	283	25.8
Mestizo	14	1.3
La Raza	95	8.9
Spanish	280	25.9

Table 2: Descriptive Statistics for all Study Variables

Variable	Range	*M*	*SD*	Missing Data	Outliers
SES – Father Education	1 – 6	2.52	1.31	32.9%	0
SES – Mother Education	1 – 6	2.59	1.38	26.6%	0
SES – Room Ratio	.17 – 7	.86	.48	1.7%	17
SES – Median Income	22,151 – 112,572	38.501	8,630	9.7%	10
SES – Computers at Home	1 – 4	2.10	.78	3.1%	0
SES – Internet at Home	Yes (64.1%) No (35.9%)	--	--	10.3%	--
SES – Home Ownership	Yes (54.9%) No (45.1%)	--	--	12.2%	--
SES – Reduced Price Lunch	Yes (76.7%) No (23.3%)	--	--	3.6%	--
Acculturation to US Year 1	7 – 35	26.14	4.39	9.3%	4
Perceived Discrimination Year 2	10 – 40	15.39	5.49	5.2%	8
Acculturative Stress, Spanish Competency Year 2	7 – 42	12.51	5.93	15.2%	17
Acculturative Stress for English Competency Year 2	6 – 26	7.85	3.62	13.8%	21
Acculturative Stress, Pressure to Acculturate Year 2	7 – 42	12.41	1.26	15.3%	13
Acculturative Stress, Pressure against Acculturation Year 2	4 – 24	5.56	2.40	13.4%	20
Familism Year 2	4 – 16	13.41	2.44	15.9%	26
Family Cohesion Year 2	12 – 55	38.18	7.47	15.4%	1
Fatalism Year 2	4 – 16	11.50	2.93	16.8%	0
Symptoms of Depression Year 2	16 – 62	29.16	8.30	20.1%	6
Smoking Year 1	0 – 3	.38	.75	1.0%	73
Smoking Year 3	0 – 3	.57	.88	17.6%	0
Alcohol Year 1	0 – 3	.84	1.04	0%	0

Alcohol Year 3	0 – 3	1.61	1.22	0%	0

Table 3: Descriptive Statistics for all Study Variables after Removing Variables with Substantial Missing Data and Outliers

Variable	Range	*M*	*SD*	Missing Data
SES – Room Ratio	.17 – 2.33	.83	.38	1.8%
SES – Median Income	22,151 – 63,611	38,128	7,595	9.5%
SES – Computers at Home	1 – 4	2.10	.78	3.0%
SES – Internet at Home	1 – 2	--	--	10.0%
SES – Home Ownership	1 – 2	--	--	12.3%
SES – Reduced Price Lunch	1 – 2	--	--	3.6%
Acculturation to US Year 1	7 – 35	26.25	4.20	9.3%
Perceived Discrimination Year 2	10 – 40	15.12	5.18	5.2%
Acculturative Stress, Spanish Competency Year 2	7 – 42	12.09	5.27	15.2%
Acculturative Stress for English Competency Year 2	6 – 26	7.49	2.59	13.8%
Acculturative Stress, Pressure to Acculturate Year 2	7 – 42	12.08	4.70	15.3%
Acculturative Stress, Pressure against Acculturation Year 2	4 – 24	5.38	1.91	13.4%
Familism Year 2	4 – 16	13.62	2.06	15.9%
Family Cohesion Year 2	12 – 55	38.18	7.47	15.4%
Fatalism Year 2	4 – 16	11.54	2.86	16.8%
Symptoms of Depression Year 2	16 – 62	28.71	7.81	20.1%
Smoking Year 1	0 – 3	.24	.47	1.0%
Smoking Year 3	0 – 3	.52	.85	17.6%
Alcohol Year 1	0 – 3	.76	.98	0%
Alcohol Year 3	0 – 3	1.58	1.22	0%

Table 4. Correlations between Continuous Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Room Ratio	--															
2. Income by ZIP	.16*	--														
3. Computers at Home	.17*	.02	--													
4. Acculturation to US	.15*	.04	.07*	--												
5. Perceived Discrimination	-.009	.08*	-.003	-.06	--											
6. Pressure to learn Spanish	.11*	.10**	.07*	.15*	.14*	--										
7. Pressure to learn English	-.20*	-.03	-.009	-.16*	.11*	.22*	--									
8. Pressure to adopt US culture	-.09*	-.05	.02	-.10*	.38*	.17*	.44*	--								
9. Pressure to adopt Mexico culture	.001	.03	.007	.05	.20*	.38*	.47*	.49*	--							
10. Familism	-.02	-.05	-.06*	.11*	-.13*	-.07*	-.05	-.002	-.08*	--						
11. Fatalism	-.09*	-.01	-.05	-.08*	.05	.06*	.11*	-.01	.02	.09*	--					
12. Family Cohesion	-.005	-.02	-.004	.006	-.16*	-.11*	.03	.02	-.06	.35*	-.07*	--				
13. Symptoms of Depression	-.03	.02	.02	-.009	.31*	.10*	.07*	.17*	.11*	-.12*	.16*	-.29*	--			
14. Smoking at Year 1	-.009	.06*	-.06*	-.04	.09*	.10*	.02	.03	.04	-.08*	.07*	-.12*	.11*	--		
15. Smoking at Year 3	.001	.03	.05	-.04	.09*	.10*	-.01	.03	.02	-.07*	.06	-.16*	.14*	.35*	--	
16. Alcohol Use at Year 1	.09*	.10*	.007	-.01	.12*	.02	-.03	.09*	.03	-.06*	.03	-.12*	.10*	.33*	.25*	--
17. Alcohol Use at Year 3	.006	.11*	-.002	-.001	.01*	.03	-.04	-.01	.002	-.07*	.09**	-.19*	.14*	.21*	.43*	.28*

*$p < .05$; p-values are only reported to the < .05 level

Table 5. Smoking and Alcohol Use Outcome Variables

Question	Project RED Data		CDC Hispanic Student Data	
	Year 1, Percent Yes	Year 3, Percent Yes	9th Grade, Percent Yes	11th Grade, Percent Yes
Have you ever tried cigarette smoking, even one or two puffs?	20.5	35.7	41.1	52.9
During the past 30 days, did you smoke cigarettes on at least one day?	0.8	8.0	14.7	18.6
Have you had at least one drink of alcohol on one day?	44.3	67.1	66.1	77.9
During the past 30 days, have you had at least one drink of alcohol on one day?	20.9	38.0	33.8	42.6
During the past 30 days, have you had 5 or more drinks of alcohol in a row with a couple of hours on at least one day?	9.4	22.3	18.0	28.0

Table 6. Demographic Data by Sex

Variable Name	Females Frequency	Females Valid Percent	Males Frequency	Males Valid Percent
Age				
12	1	0.1	0	0
13	62	8.4	44	7.2
14	635	86.0	520	85.0
15	39	5.3	47	7.7
16	1	0.1	1	0.2
Birth Country				
US	640	89.0	511	86.0
Other	79	11.1	83	14
Ethnic Identity				
American	4	0.7	9	2.2
Indian/Alaska	10	1.4	2	.05
Asian	8	1.5	11	2.8
Black/African	418	68.9	273	61.6
American	408	69.4	268	60.4
Hispanic	6	1.1	4	1.0
Latino	44	8.2	25	6.3
Native Hawaiian	401	69.7	324	70.3
White	30	5.6	31	7.7
Mexican	14	2.6	14	3.5
Central American	429	71.3	335	71.9
South American	128	23.7	108	25.7
Mexican American	6	1.1	3	0.8
Chicano	29	5.5	42	10.4
Mestizo	149	28.0	94	23.1
La Raza				
Spanish				

Table 7. Descriptive Data of Study Variables by Sex

Variable	Female *M*	Female *SD*	Female Percent Missing	Male *M*	Male *SD*	Male Percent Missing
SES – Room Ratio	.81	.37	1.6	.85	.39	2.0
SES – Median Income	38,056.74	7,646.57	7.6	38,186.35	7,575.25	11.5
SES – Computers at Home	2.11	.76	2.6	2.06	.79	3.6
SES – Internet at Home	Yes (63.8%) No (36.2%)	--	--	Yes (65.3%) No (34.7%)	--	--
SES – Home Ownership	Yes (51.7%) No (48.3%)	--	--	Yes (58.5%) No (41.5%)	--	--
SES – Reduced Price Lunch	Yes (76.0%) No (24.0%)	--	--	Yes (77.2%) No (22.8%)	--	--
Acculturation to US Year 1	26.83	3.88	8.5	25.59	4.33	9.3
Perceived Discrimination Year 2	14.65	4.83	3.9	15.66	5.55	5.5
Acculturative Stress, Spanish Competency Year 2	12.11	5.28	15.4	12.13	5.31	14.3
Acculturative Stress for English Competency Year 2	7.38	2.46	14.7	7.57	2.66	12.4
Acculturative Stress, Pressure to Acculturate Year 2	12.26	4.67	15.9	11.82	4.70	13.8
Acculturative Stress, Pressure against Acculturation Year 2	5.40	1.90	13.8	5.33	1.92	12.7
Familism Year 2	13.72	2.04	16.1	13.54	2.07	14.8
Fatalism Year 2	11.72	2.84	17.3	11.33	2.85	15.4

Family Cohesion Year 2	38.18	7.71	15.2	38.95	6.77	14.1
Symptoms of Depression Year 2	30.27	8.11	20.0	26.89	6.97	19.0
Smoking Year 1	.24	.46	0.90	.26	.48	1.3
Smoking Year 3	.41	.76	17.9	.63	.92	16.7
Alcohol Year 1	.79	.99	0.0	.72	.96	0.0
Alcohol Year 3	1.54	1.21	0.0	1.62	1.23	0.0

Table 8. Correlations between Continuous Variables, Split by Sex (Top Half Females, Bottom Half Males)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Room Ratio	--	.15*	.12*	.15*	.003	.13*	-.11*	-.06	.03	-.05	-.11*	.02	.003	.06	-.01	.15*	.03
2. Income by ZIP	.17*	--	.00	.006	.05	.09*	-.05	-.09*	.05	-.10*	.02	-.02	.004	.08*	.07	.10*	.13*
3. Computers at Home	.22*	.04	--	.10*	-.01	.06	-.05	.06	.01	-.09*	-.06	-.02	.02	-.06	-.02	.001	-.02
4. Acculturation to US	.17*	.04	.03	--	-.03	.18*	-.19*	-.07	.09*	.06	-.08	-.03	-.05	-.04	.02	-.01	.04
5. Perceived Discrimination	-.03	.12*	.009	-.05	--	.15*	.11*	.39*	.20*	-.13*	.09*	-.17*	.35*	.07*	.10*	.13*	.14*
6. Spanish Competency	.09*	.13*	.08	.14*	.12*	--	.16*	.14*	.39*	-.07	.09*	-.10*	.10*	.14*	.18*	.06	.10*
7. English Competency	-.12*	.02	.02	-.08	.08	.27*	--	.40*	.40*	-.03	.09*	.03	.05	.01	-.02	-.01	.00
8. Accept US Culture	-.08	.008	-.02	-.12*	.38*	.21*	.48*	--	.46*	-.02	-.03	.02	.15*	.02	.03	.12*	.03
9. Accept Mexico Culture	-.01	.004	-.02	.02	.19*	.37*	.56*	.52*	--	-.09*	.05	-.06	.14*	.09	.06	.02	.03
10. Familism	.005	.02	-.04	.13*	-.12*	-.07	-.05	.01	-.07	--	.13*	.35*	-.09*	-.08	-.05	-.05	-.02
11. Fatalism	-.04	-.04	-.06	-.12*	.03	.02	.12*	-.02	-.02	.04	--	-.03	.12*	.08	.08	.04	.15*
12. Family Cohesion	-.06	-.05	0.02	0.04	-.15*	-.13*	.07	.05	-.05	.36*	-.11*	--	-.27*	-.11*	-.17*	-.11*	-.22*
13. Symptoms of Depression	-.02	.07	-.01	-.003	.34*	.12*	.10*	.17*	.08	-.19*	.16*	-.32*	--	.14*	.20*	.11*	.20*
14. Smoking at Year 1	-.07	.05	-.06	-.02	-.10*	.05	-.01	.05	.01	-.07	.05	-.11*	.07	--	.37*	.35*	.22*
15. Smoking at Year 3	-.01	-.02	-.06	-.06	.06	.01	-.02	0.4	-.02	-.10*	.04	-.16*	.13*	.34*	--	.28*	.42*
16. Alcohol Use at Year 1	.04	.10*	.003	-.03	.11*	-.04	-.o06	.04	.04	-.07	-.01	-.14*	.05	.31*	.23*	--	.31*
17. Alcohol Use at Year 3	-.02	.08	.02	-.04	.05	-.04	-.08	-.05	-.02	-.13*	.03	-.15*	.08	.29*	.44*	.24*.	--

*$p < .05$; p-values are only reported to the < .05 level

Table 9. Factor Loadings for SES and Acculturative Stress Latent Variables

Variable	Unstandardized Estimate	Standard Error	*β*	*p*
SES				
Home Ownership	.55	.01	.73	***
Room Ratio	.83	.01	.47	***
Median Income Based on ZIP Code	38,104.10	213.70	.34	***
Reduced Price Lunch	.23	.01	.28	***
Computers at Home	2.10	.02	.32	***
Internet at Home	.64	.01	.26	***
Acculturative Stress				
Pressure to Acculturate	12.09	.14	.63	***
Pressure against Acculturation	5.38	.55	.80	***
English Competency Pressures	7.51	.08	.62	***
Spanish Language Pressures	12.11	.15	.41	***

***$p < .001$

Table 10. Correlations between Descriptive and Outcome Variables

Variable	1	2	3	4	5
1. Age	--				
2. Grade	.65*	--			
3. Smoking Year 1	.03	-.03	--		
4. Smoking Year 3	.01	-.01	.35**	--	
5. Alcohol Year 1	-.03	.003	.33**	.26**	--
6. Alcohol Year 3	.02	.02	.21**	.43**	.28**

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

Table 11. *t*-Test results between Sex and Outcome Variables

Variable	*Female M*	*SD*	*Male M*	*SD*	*t*	*df*	*p*
Smoking Year 1	.24	.46	.26	.48	-.79	1337	.43
Smoking Year 3	.41	.76	.63	.92	-4.36	1117	< .01
Alcohol Year 1	.79	.99	.72	.96	.57	1352	.19
Alcohol Year 3	1.54	1.22	1.62	1.23	-1.27	1352	.21

Table 12: Structural Equation Model Results with SES

Path	Unstandardized Estimate	Standard Error	*β*	*p*
SES → Perceived Discrimination	1.15	.53	.08	.03
SES → Acculturative Stress	.008	.19	.002	.97
SES → Familism	-.44	.22	-.07	.05
SES → Family Cohesion	-.35	.78	-.02	.66
SES → Fatalism	-.63	.31	-.08	.05
Perceived Discrimination → Familism	-.04	.01	-.11	***
Perceived Discrimination → Family Cohesion	-.22	.04	-.16	***
Perceived Discrimination → Fatalism	.03	.02	.05	.13
Perceived Discrimination → Symptoms of Depression	.36	.04	.24	***
Acculturative Stress → Familism	-.06	.05	-.05	.19
Acculturative Stress → Family Cohesion	.02	.16	.004	.89
Acculturative Stress → Fatalism	.08	.06	.04	.22
Acculturative Stress → Symptoms of Depression	.38	.16	.08	.02
Familism → Symptoms of Depression	-.05	.11	-.01	.64
Family Cohesion → Symptoms of Depression	-.26	.03	-.24	***
Fatalism → Symptoms of Depression	.35	.08	.13	***
Symptoms of Depression → Smoking at Year 3	.02	.003	.14	***
Symptoms of Depression → Alcohol Use at Year 3	.02	.004	.12	***
SES → Smoking at Year 3	.09	.08	.04	.32
SES → Alcohol Use at Year 3	.12	.12	.04	.30

*** $p < .001$

Table 13: Structural Equation Model Results with SES without Acculturative Stress

Path	Unstandardized Estimate	Standard Error	*β*	*p*
SES → Perceived Discrimination	1.14	.53	.08	.03
SES → Familism	-.43	.22	-.07	.06
SES →Family Cohesion	-.34	.78	-.02	.66
SES →Familism	-.64	.31	-.08	.43
Perceived Discrimination → Familism	-.05	.01	-.12	***
Perceived Discrimination → Family Cohesion	-.22	.04	-.16	***
Perceived Discrimination → Fatalism	.03	.02	.06	.07
Perceived Discrimination → Symptoms of Depression	.39	.04	.26	***
Familism → Symptoms of Depression	-.06	.11	-.02	.55
Family Cohesion → Symptoms of Depression	-.26	.03	-.24	***
Fatalism → Symptoms of Depression	.36	.08	.13	***
Symptoms of Depression → Smoking at Year 3	.02	.003	.14	***
Symptoms of Depression → Alcohol Use at Year 3	.02	.004	.12	***
SES → Smoking at Year 3	.09	.09	.04	.32
SES → Alcohol Use at Year 3	.12	.12	.04	.30

*** $p < .001$

Table 14. Structural Equation Model Results with Acculturation

Path	Unstandardized Estimate	Standard Error	*β*	*p*
Acculturation → Perceived Discrimination	-.07	.35	.-.05	.07
Acculturation → Acculturative Stress	-.01	.01	-.04	.23
Acculturation → Familism	.05	.02	.11	***
Acculturation → Family Cohesion	.007	.05	.004	.89
Acculturation → Fatalism	-.06	.02	-.08	.009
Perceived Discrimination → Familism	-.04	.01	-.11	***
Perceived Discrimination → Family Cohesion	-.23	.05	-.16	***
Perceived Discrimination → Fatalism	.02	.02	.03	.34
Perceived Discrimination → Symptoms of Depression	.35	.05	.23	***
Acculturative Stress → Familism	-.05	.05	-.03	.37
Acculturative Stress → Family Cohesion	.10	.18	.02	.60
Acculturative Stress → Fatalism	.08	.07	.04	.31
Acculturative Stress → Symptoms of Depression	.42	.19	.08	.02
Familism → Symptoms of Depression	-.05	.11	-.01	.65
Family Cohesion → Symptoms of Depression	-.26	.03	-.24	***
Fatalism → Symptoms of Depression	.35	.08	.13	***
Symptoms of Depression → Smoking at Year 3	.01	.003	.12	***
Symptoms of Depression → Alcohol Use at Year 3	.02	.004	.12	***
Acculturation → Smoking at Year 3	-.007	.006	-.04	.23
Acculturation → Alcohol Use at Year 3	.001	.008	.003	.92

***$p < .001$

Appendix A: Letter of Support, Dr. Jennifer Unger

USC

UNIVERSITY OF SOUTHERN CALIFORNIA

Keck School of Medicine

Jennifer B. Unger, Ph.D.
Professor of Preventive Medicine

September 7, 2011

Alisha D. Adams, M.A.
Department of Psychology
University of Missouri – Kansas City
5030 Cherry Hall, Room 302
Kansas City, MO 64110

Dear Ms. Adams,

This letter is to grant approval for you to use my data set as the basis for your dissertation. Your dissertation ideas align well with my research, which focuses on the psychological, social, and cultural risk and protective factors for health-related behaviors among adolescents.

This letter grants my permission to you to use one of my current projects, Project RED (Retiendo y Entendiendo Diversidad para Salud). It is a longitudinal study with variables focused on cultural, social, and psychological factors that may protect against, or serve as risk factors for, substance use/abuse among Hispanic adolescents. Your proposal to use the data to test the Reserve Capacity Model is novel and does not overlap with any research being conducted by my own team. I welcome the opportunity for the data to be tested in this manner.

If you have any questions or concerns, please feel free to contact me via email at unger@usc.edu.

Sincerely,

Jennifer Unger, Ph.D.

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Alhambra, CA 91803
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Appendix B: Questionnaire Constructs and Questions

Construct	Questions and Response Options
SES (Year 1, 2005)	What is the highest grade completed by <u>your father</u>? (guess if not sure): *Response Options*: 8th grade or less, Some high school, High school graduate, Some college, College graduate, Advanced degree, I don't know What is the highest grade completed by <u>your mother</u>? (guess if not sure) *Response Options*: 8th grade or less, Some high school, high school graduate, Some college, College graduate, Advanced degree, I don't know How many people live in the home where you spend most of your time (including you)? *Response Options*: 2 people, 3 people, 4 people, 5 people, 6 people, 7 or more How many rooms does your house or apartment have? (Don't count the kitchen and the bathroom) *Response Options*: 1 room, 2 rooms, 3 rooms, 4 rooms, 5 rooms, 6 rooms, 7 or more rooms What is the ZIP Code of the home where you spend most of your time? *Response Options*: none (open-ended question); data will be gathered from the Census website to indicate median household income for the ZIP code reported Are you eligible for a free or reduced price lunch at school? *Response Options*: Yes or No How many [Computers] are in your home? *Response Options*: None, 1, 2, 3 or more Does your family own its home or rent from a landlord? *Response Options*: Own, Rent, I don't know Do you have internet access at home? *Response Options*: Yes or No

Acculturation (Year 1, 2005)	*All questions had the same response options*: Not at all, Very little/Not very much, Moderately, Very much/Very often, Almost always/Extremely often
	I speak English
	I associate with Anglos or Whites
	I enjoy listening to English language music
	I enjoy reading books in English
	I write letters in English
	My thinking is done in the English language
Perceived Discrimination (Year 2, 2006)	*All questions had the same response options*: Never, Rarely, Sometimes, Often
	Because of your culture…. You are treated with less respect than other people.
	Because of your culture…. You are treated with less courtesy than other people.
	Because of your culture…. People act as if they think you're not smart.
	Because of your culture…. People act as if they're better than you.
	Because of your culture…. You receive poorer service than other people at restaurants or stores.
	Because of your culture…. People ignore you or act as if you are not there.
	Because of your culture…. You are threatened or harassed.
	Because of your culture…. You or your family members are called names or insulted.

	Because of your culture…. People act as if they think you are dishonest.
	Because of your culture…. People act as if they are afraid of you.
Acculturative Stress (Year 2, 2006)	*All questions had the same response options*: No/Does not apply, Not at all stressful, A little stressful, Somewhat stressful, Very stressful, Extremely stressful
Spanish Competency Pressures	I don't speak Spanish or don't speak it well.
	I feel uncomfortable being around people who only speak Spanish.
	I feel pressure to learn Spanish.
	I have a hard time understanding others when they speak Spanish.
	Since I don't speak Spanish well, people have treated me rudely or unfairly.
	It bothers me when people assume that I speak Spanish.
	I have been discriminated against because I have difficulty speaking Spanish.
	It bothers me that I speak Spanish with an accent.
English Competency Pressures	I don't speak English or don't speak it well.
	I have been discriminated against because I have difficulty speaking English.
	Since I don't speak English well, people have treated me rudely or unfairly.
	I feel pressure to learn English.
	It bothers me that I speak English with an accent.
	I have a hard time understanding others when they speak English.

	I feel uncomfortable being around people who only speak English.
	It bothers me that I speak Spanish with an accent.
	It bothers me when people assume that I speak English.
Pressure to Acculturate	It bothers me when people pressure me to assimilate (or change) to the American ways of doing things.
	It bothers me when people don't respect my Latino/Hispanic values (e.g., family).
	Because of my cultural background, I have a hard time fitting in with Whites.
	I feel uncomfortable when others expect me to know American ways of doing things.
	I don't feel accepted by Whites.
	I feel uncomfortable when I have to choose between Latino/Hispanic and American ways of doing things.
	People look down upon me if I practice Latino/Hispanic customs.
	I feel uncomfortable because my family members do not know Latino/Hispanic ways of doing things.
	I have had conflicts with others because I prefer Latino Hispanic customs (e.g., celebrating Día de los Muertos, Quinceañeras) over American ones (e.g., celebrating Halloween, Thanksgiving).
	At times, I wish that I were more Latino/Hispanic.
Pressure against Acculturation	It bothers me when people don't respect my American values (e.g. Independence)
	Because of my cultural background, I have a hard time fitting in with Latinos/Hispanics.
	I don't feel accepted by Latinos/Hispanics.
	I am self-conscious about my Latino background.
	People look down upon me if I practice American customs.

	I am self-conscious about my American background.
	I feel uncomfortable because my family does not know American ways of doing things.
	I have had conflicts with others because I prefer American customs (e.g., celebrating Halloween, Thanksgiving) over Latino/Hispanic ones (e.g., celebrating Día de los Muertos, Quinceañeras.
	I feel uncomfortable when others expect me to know Latino/Hispanic ways of doing things.
	At times, I wish that I were more American.
Reserve Capacity: Familism (Year 2, 2006)	*All questions had the same response options*: Definitely no, Probably no, Probably yes, Definitely yes
	If one of my relatives needed a place to stay for a few months, my family would let them stay with us.
	I expect my relatives to help me when I need them.
	When a family makes an important decision, they should talk about it with their close relatives.
	If anyone in my family needed help, we would all be there to help them.
Reserve Capacity: Family Cohesion (Year 2, 2006)	*All questions had the same response options*: Almost never, Once in a while, Sometimes, Frequently, Almost always
	Family members feel very close to each other.
	Discipline is fair in our family.
	Our family tries new ways of dealing with problems.
	In our family, everyone shares responsibility.
	Family members like to spend their free time with each other.
	Family members go along with what the family decides to do.

Reserve Capacity: Fatalism (Year 2, 2006)	*All questions had the same response options*: Definitely no, Probably no, Probably yes, Definitely yes
	It's more important to enjoy life now than to plan for the future.
	People can't really do much to change what happens in life. You just have to accept things.
	I live for today because I don't know what will happen in the future.
	I don't plan ahead because most things in life are a matter of luck.
Symptoms of Depression (Year 2, 2006)	*All questions had the same response options*: Less than 1 day or never; 1-2 days, 3-4 days, 5-7 days
	I was bothered by things that usually don't bother me.
	I did not feel like eating, my appetite was poor.
	I had trouble shaking off sad feelings.
	I felt that I was just as good as other people.
	I had trouble keeping my mind on what I was doing.
	I felt depressed.
	I felt that everything I did was difficult.
	I felt hopeful about the future.
	I thought my life had been a failure.
	I felt fearful.
	I didn't sleep well.
	I was happy.
	I talked less than usual.

I felt lonely.

People were unfriendly.

I enjoyed life.

I had crying spells.

I felt sad.

I felt people disliked me.

I could not "get going."

Smoking Behaviors (Years 1 and 3, 2005 and 2007)

Response options for these items varied, but were later consolidated as noted in the Method section.

Have you ever tried cigarette smoking, even one or two puffs?
Response Options: Yes or No

During the past 30 days, on how many days did you smoke cigarettes?
Response Options: 0 days, 1 or 2 days, 3 to 5 days, 6 to 9 days, 10 to 19 days, 20 to 29 days, All 30 days

During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
Response Options: I did not smoke cigarettes in the past 30 days, Less than 1 cigarette per day, 2 to 5 cigarettes per day, 6 to 10 cigarettes per day, 11 to 20 cigarettes per day, More than 20 cigarettes per day,

Alcohol Use (Years 1 and 3, 2005 and 2007)

Response options for these items varied, but were later consolidated as noted in the Method section.

During your life, on how many days have you had at least one drink of alcohol? (please do not count drinking alcohol for religious purposes like communion wine)
Response Options: Yes or No

During the past 30 days, on how many days did you have at least one drink of alcohol?

Response Options: 0 days, 1 or 2 days, 3 to 5 days, 6 to 9 days, 10 to 19 days, 20 to 29 days, All 30 days

During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
Response Options: Response Options: 0 days, 1 day, 2 days, 3 to 5 days, 6 to 9 days, 10 to 19 days, 20 or more days

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VITA

Alisha D. Howarter was born on January 21, 1982 in Springfield, Missouri. She was educated in public schools across four different states including Texas, Colorado, Illinois, and Kansas. She graduated from Topeka West High School in 2000. She received an academic scholarship to Washburn University in Topeka, Kansas, where she completed bachelors' degrees in Human Services (2004) and Spanish Language (2005). She was the valedictorian of her college class and received the Sibberson Award, reflecting her status as the highest ranking senior graduate with additional community service and academic achievements.

In 2008, Ms. Howarter was admitted to the University of Missouri – Kansas City graduate school program. She received an award as the *Student Therapist of the Year, Kansas City Free Health Clinic, 2010 – 2011*. She was awarded the *Elister Hall Dewberry Award,* in 2010 to help fund her master's thesis project, which was later nominated by the department of psychology for the *Outstanding Master's Thesis Award.* She earned her Master's Degree in May 2011.

In the fall of 2011 she was awarded the Preparing Future Faculty fellowship, for her excellence in teaching and research endeavors. Her hard work and continued teaching commitments have allowed her to renew this fellowship through the 2013-2014 academic year.

Ms. Howarter matched at an APA-accredited internship at the Federal Correctional Institute of Fort Worth, Texas, in August 2013. She is currently completing her clinically-supervised hours required for her doctoral degree. She has been the primary author on two publications, and co-authored three additional publications as follows:

Howarter, A. D., Bennett, K. K., Barber, C. E., Gessner, S. N., & Clark, J. M. R. (2014). Exercise self-efficacy and symptoms of depression after cardiac rehabilitation: Predicting changes over time using a piecewise growth curve analysis. *Journal of Cardiovascular Nursing, 29*(2), 168-177. doi: 10.1097/JCN.0b013e318282c8d6

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Since her arrival, she has had the privilege to lead or co-instruct multiple classes including Motivation and Emotion in Psychology, Social Psychology, Experimental Methods in Psychology, and History & Systems of Psychology. She has been an invited guest lecturer in several classes, including Ethnic & Minority Psychology, Sensations & Perceptions in Psychology, Advanced Child Assessment Methods, and Introduction to Psychology. She has completed over 3,000 hours of community service at the Kansas City Free Health Clinic, Children Mercy Hospital, and the Kansas City Center for Anxiety treatment. Upon completion of her degree requirements, she plans to continue a career in academia, while maintaining a providing psychotherapy services to underserved populations.

Ms. Howarter is a member of the American Psychological Association, the Association for Psychological Sciences, and the Society for Behavioral Medicine.