

The Role of Common and Specific Components of Internalizing
Distress in Predicting Alcohol Use
Among Mexican American Adolescents

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved July 2017 by the
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May 2018

ABSTRACT

Mexican American adolescents report high rates of internalizing symptomatology and alcohol use. However, very little research has explored to what extent internalizing distress may contribute to alcohol use among this population. The current study utilized longitudinal data from a community sample of Mexican American adolescents ($n=626$, 51% female) to test a series of hypotheses about the role of internalizing distress on alcohol use and misuse. Specifically, this study used a bifactor modeling approach to investigate (1) whether different forms of internalizing distress are composed of common and unique components; (2) whether and to what extent such components confer risk for alcohol use; and (3) whether youth cultural orientation plays a role in these associations. Confirmatory factor analyses revealed that a bifactor model with a general factor and three specific factors (depressed mood, general worry, social anxiety) provided good fit to the data. The general distress factor was significantly associated with past month alcohol use but not binge drinking. However, these effects were conditional based on level of acculturation. Differential relations were found between the specific factors of internalizing distress and alcohol use. Depressed mood predicted past month alcohol use among girls; social anxiety negatively predicted past three month binge drinking among boys. Overall, results highlight the multidimensional nature of internalizing distress and suggest that both common and unique components of internalizing distress may be relevant to the etiology of alcohol use among Mexican-American adolescents. Findings underscore the importance of considering cultural orientation as a moderating factor when investigating substance use among Hispanic youth. Implications for future research

examining the etiological relevance of the internalizing pathway to alcohol use among Hispanic adolescents are discussed.

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my advisors, Nancy Gonzales and Laurie Chassin, for the wonderful co-mentorship I received during graduate school. I am deeply grateful for the close mentorship Laurie provided me during my early doctoral training and appreciate her challenging me to always think critically. In addition, I would like to extend my heartfelt thanks to Nancy for helping me broaden my understanding of the roles of culture and context. I would also like to thank Manuel Barrera and Jenn-Yun Tein for their support and thoughtful contributions to my dissertation project.

I will remain forever indebted to my cohort mates for helping me get through graduate school: Kyle Menary, Katie Panza, Ida Rystad, Jenna Rudo-Stern, and Chung Jun Mun. Each year of this program presented its own unique challenges, and I never could have survived without your optimism and humor. In addition, thank you to my family, particularly my mother and father, Mimi and Mark, and my brother, Simeon, for your constant encouragement and unwavering emotional support. I would also like to thank Melanie for her support and thoughtfulness. Finally, a wholehearted thanks to my dear friend, Kate Kiehl, for our 7-13%. Thank you for always being there for me through the highs and lows, old friend.

I would also like to acknowledge the generous support of the National Science Foundation, which provided a Graduate Research Fellowship that made this dissertation project possible.

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INTRODUCTION

Alcohol Use among Mexican American Adolescents

Findings from several population-based studies suggest that Hispanic adolescents represent a high-risk group for alcohol use in the United States (Johnston et al., 2014; Swendsen et al., 2012). For example, data from the 2014 Monitoring the Future study revealed that 33% of Hispanic 8th grade students had engaged in past month alcohol use, compared to 25.1% of African-American and 25% of Caucasian students (Johnston et al., 2014). Within the Hispanic population, youth of Mexican descent make up the largest sub-group, and have similarly been found to report high rates of alcohol use relative to other racial/ethnic groups of the same age cohort (Delva et al., 2005; Tschann et al., 2005).

Although disparities in alcohol use between Mexican American youth and those of other ethnic groups are often cited, research has yet to fully disentangle the underlying reasons for this phenomenon (Castro, Barrera, Mena, & Aguirre, 2014; Chartier & Caetano, 2010). Indeed, scholars have underscored the paucity of studies examining the determinants and antecedents of alcohol use among Mexican American adolescents (Parsai et al., 2008). Moreover, much of the existing evidence has aggregated Mexican American adolescents with youth from other Hispanic backgrounds, obfuscating potentially important cultural differences between these groups (Gonzales et al., 2002; Prado et al., 2008).

One area of research that remains particularly unclear in the literature is the extent to which different forms of internalizing distress may contribute to alcohol use among

Mexican American youth. Although a wealth of research studies have confirmed the substantial role that externalizing factors (i.e., conduct problems) play in alcohol use among Mexican American youth (Gonzales et al., 2017; Simon et al., 1994; Turner & Gil, 2002), considerably fewer studies have examined the role of internalizing symptoms (Gonzales et al., 2017; Parrish et al., 2016).

The internalizing pathway to alcohol use holds that individuals that experience high levels of negative affectivity such as anxiety and depression may be prone to use alcohol or other substances as a means to regulate mood and/or relieve tension (Hussong et al., 2011). Epidemiological data indicate that Mexican American adolescents may be a high-risk group for the internalizing pathway to alcohol use for several reasons. First, Mexican American adolescents report high levels of internalizing distress symptoms¹ relative to Caucasian and African American adolescents (González, Tarraf, Whitfield, & Vega, 2010; Joiner, Perez, Wagner, Berenson, & Marquina, 2001; Roberts, Roberts, & Xing, 2006). Second, Hispanic adolescents (of which Mexican-American youth make up the largest sub-group) report high rates of alcohol use and misuse compared to adolescents from other racial/ethnic groups (Chen et al., 2012; Delva et al., 2005; Johnson et al., 2014; Swendsen et al., 2012; Tschann et al., 2005).

Although very few longitudinal studies have examined the associations between internalizing symptoms and alcohol use among Mexican American youth, findings from two recent studies suggest that internalizing symptomatology may be an important contributor to alcohol use in this population. Gonzales et al. (2017) investigated the role

¹ For the current investigation, we use the term internalizing distress to encompass internalizing psychopathological symptoms such as depressed mood and anxiety, and will herein refer to “internalizing distress” and “internalizing symptoms” interchangeably throughout the text.

of internalizing symptoms, operationalized as a composite measure of generalized anxiety, social anxiety, and depression symptoms, on problem alcohol and substance use in a sample of Mexican American adolescents. Findings revealed that youth-reported internalizing symptoms in middle school predicted problematic alcohol use in late high school, after controlling for externalizing symptoms and other relevant covariates.

Similarly, Parrish and colleagues (2016) took a more nuanced approach and investigated whether different facets of internalizing symptoms assessed at age 14 were differentially associated with alcohol use at age 16 in a sample of Mexican origin youth. More specifically, this study examined the relations between overall internalizing symptoms (a composite of depression and anxiety symptoms), anhedonic depression, cognitive symptoms of anxiety, anxious-arousal symptoms of anxiety, and frequency of past month alcohol use. Results demonstrated that overall internalizing symptoms and anxious-arousal symptoms of anxiety prospectively predicted frequency of alcohol use, over and above externalizing symptoms. However, anhedonic depression and cognitive symptoms of anxiety were not associated with alcohol use. These findings are consistent with those of prior studies that highlight the importance of considering specific forms of internalizing symptomatology when investigating their associations with substance use (Hussong et al., 2017; Kaplow, Curran, Angold, & Costello, 2001; Nichter & Chassin, 2015). Indeed, while it may make theoretical sense to combine depression and anxiety symptoms given their high degree of co-occurrence, conflating these constructs may unintentionally blur their respective associations with adolescent substance use.

Internalizing Symptomatology among Mexican American Adolescents

Mexican American adolescents report high levels of internalizing symptomatology relative to Caucasian and African-American youth, after controlling for relevant covariates such as socioeconomic status (González, Tarraf, Whitfield, & Vega, 2010; Piña-Watson, Dornhecker, & Salinas, 2015; Roberts, Roberts, & Xing, 2006). Similar findings have been observed in studies of Hispanic youth as well (Hovey & King, 1996; Saluja et al., 2004; Twenge & Nolen-Hoeksema, 2002). For example, using a nationally representative sample of adolescents, Saluja and colleagues (2004) found that Hispanic adolescents in grades 6, 8, and 10 reported significantly higher levels of depressive symptoms compared to Caucasian, Asian-American, and African American youth.

Although exploring the potential explanations for these racial/ethnic differences are beyond the focal topic of this paper, a number of factors have been suggested to account for these disparities. Such factors include the influence of acculturative stress (Hovey & King, 1996), perceived discrimination (Phinney, Madden, & Santos, 1998), differences in cognitive attributions between Latino and other ethnic groups (Joiner et al., 2001), and other cultural variables (Piña-Watson et al., 2015; Twenge & Nolen-Hoeksema, 2002).

In addition to heightened levels of depressive symptomatology, a more limited body of research has explored differences in anxiety symptoms between Hispanic youth and those of other racial/ethnic backgrounds (for a review, see Anderson & Mayes, 2010). Findings in this area have been more mixed, with some studies suggesting that Hispanic and Caucasian youth have similar rates of anxiety disorders and trait anxiety,

whereas others suggest that Hispanic youth report higher rates of certain forms of anxiety (Anderson & Mayes, 2010; Creveling et al., 2010; Ginsburg & Silverman, 1996; Pina & Silverman, 2004; Roberts, Roberts, & Xing, 2006; Silverman, La Greca, & Wasserstein, 1995; Wasserstein & La Greca, 1998).

Assuming that the differences in the prevalence rates of anxiety/depression among Hispanic youth and those of other racial/ethnic categories are real, it is important to stress that these differences have not been found to be due to confounding factors, such as socioeconomic status. However, caution is warranted in the broad interpretation of such findings given that many of these studies did not examine whether effects differed by acculturation/enculturation status (see Gonzales et al., 2002). This warning notwithstanding, there nonetheless is a large body of research which suggests that Mexican American adolescents are a high-risk group for internalizing symptomatology relative to Caucasian and African-American youth (Piña & Silverman, 2004; Piña-Watson et al., 2015; Silverman, La Greca, & Wasserstein, 1995; Wasserstein & La Greca, 1998; Siegel et al., 1998; Saluja et al., 2004).

Common and Specific Components of Internalizing Distress and Alcohol Use

Thus far, the vast majority of studies investigating the contribution of internalizing distress to alcohol use (among primarily Caucasian samples) have done so by examining the association between specific internalizing disorders and alcohol use/dependence (Kaplow et al., 2001; Woodward & Fergusson, 2001; Zimmerman et al., 2003). While findings from these studies provide important epidemiological data, they at the same time fail to acknowledge that internalizing symptoms are often highly correlated

(Lahey et al., 2016). Indeed, not only are anxiety and depression quite common among adolescent populations, but they also tend to co-occur at higher rates than would be expected by chance (Merikangas et al., 2010).

One major gap in the current alcohol use literature is that very few studies have examined (a) whether the associations between internalizing disorders and alcohol use/dependence are unique to a specific type of internalizing disorder; or (b) whether multiple internalizing disorders share common etiologic components that portend risk for alcohol use (Kushner et al., 2012). However, findings from a handful of recent studies exploring this topic indicate that a common distress component shared by multiple forms of internalizing disorders may put youth universally at risk for alcohol use and disorder (Kushner et al., 2012; Pardee, Colder, & Bowker, 2014; Parrish et al., 2016). Such findings are important because they suggest that different internalizing disorders may share common genetic risk factors that directly influence propensity for alcohol use and disorder (Kendler et al., 2011).

Kushner and colleagues (2012) investigated this “general” versus “specific” question in a population sample of adults using a two-step approach. First, he used exploratory factor analysis to examine whether seven DSM-IV internalizing disorders shared common and unique components. Second, he investigated whether these components were differentially associated with risk for alcohol dependence. Findings revealed that a broad higher-order internalizing distress factor underlying all internalizing disorders was a robust predictor of alcohol dependence. However, once common variance was removed, having any specific internalizing disorder provided little predictive

information regarding the risk for meeting diagnostic criteria for alcohol dependence. Paralleling these findings, Pardee, Colder, & Bowker (2014) examined the role of common and specific components of generalized and social anxiety symptoms on alcohol use among middle-school aged adolescents. Results indicated that common variance shared by generalized and social anxiety (e.g., general distress, anxious apprehension, and physiological arousal) conferred risk for adolescent alcohol use. However, after overlapping elements had been partialled out, what remained unique to social or generalized anxiety symptoms was not germane to alcohol use.

Findings by Kushner and Pardee are in accordance with a broader literature which suggests that different forms of internalizing distress share common and unique components (Brodbeck et al., 2014; Ebesutani et al., 2011; Ebesutani et al., 2012; Lahey et al., 2016; Norton, Cosco, Doyle, Done, & Sacker, 2013; Snyder et al., 2015). Although previously used in the context of cognitive research, researchers have recently begun using bifactor and other types of hierarchical models to better understand the common and unique components of internalizing disorders (Brodbeck et al., 2014; Higa-McMillan et al., 2008; Lahey et al., 2008). Bifactor models acknowledge the role of a general distress component onto which all observed items load (Brodeck et al., 2014). They also permit more specific sub-domains of psychopathology to be present as independent specific factors (Chen et al., 2006). See Figure 1 for an example of a bifactor model.

Prior studies employing bifactor models indicate that internalizing symptoms are composed of common and unique components (Brodbeck et al., 2014; Ebesutani et al., 2011; Ebesutani et al., 2012; Norton, Cosco, Doyle, Done, & Sacker, 2013; Snyder et al.,

2015). For example, Ebesutani et al. (2011) fit a bifactor model to the negative affect items of the PANAS-C in a sample of older adolescents and found that negative affectivity was composed of a general factor and two specific factors—fear and distress. This study found that symptoms related to being angry, sad, upset, and gloomy loaded highest on the distress factor, while symptoms related to being afraid, scared, frightened, or nervous loaded highest on the fear factor. Similarly, Brodeck and colleagues (2014) investigated whether a general distress component might underlie symptoms in two measures of depression and anxiety in a nationally representative sample of British adolescents. Results indicated that a bifactor model provided the best fit to the data. The bifactor model included a general distress factor and three specific factors: (1) hopelessness—suicidal ideation; (2) generalized worrying; and (3) restlessness—fatigue. Each of the specific factors found were hypothesized to represent independent constructs or dimensions of psychopathology.

In summary, although the specific factors found in each of the aforementioned studies differed likely due to methodological differences, findings from these studies provide support for the notion that internalizing symptoms are composed of common and unique variance (Brodeck et al., 2008; Higa-McMillan et al., 2008; Simms et al., 2008; Xie et al., 2012). Some preliminary evidence indicates that alcohol use may be more related to common variance shared by multiple forms of internalizing disorders rather than to any specific internalizing disorder (Kushner et al., 2012; Pardee, Colder, & Bowker, 2014). However, current knowledge about this area of research is limited and further study is warranted.

In order to address this gap in the literature, the current study used a bifactor modeling approach to examine the association between common and specific features of internalizing distress and alcohol use among Mexican American adolescents. This research topic is important as it may elucidate whether a broad distress component underlying multiple forms of internalizing symptoms puts adolescents at risk for alcohol use. Moreover, findings may extend current understanding about the extent to which unique facets of internalizing distress are more or less relevant to alcohol use. This area of research is significant given recent work that has found opposing associations between different forms of internalizing symptoms and adolescent alcohol use (Hussong et al., 2017; Nichter & Chassin, 2015).

In terms of the domain-specific facets of internalizing symptoms, prior studies examining the hierarchical factor structure of mood and anxiety disorders have yielded support for the differentiation of depressed mood, anxiety/worry, and social anxiety/fear (Chorpita, Moffitt, & Gray, 2005; Henry & Crawford, 2005; Norton et al., 2013; Snyder et al., 2015; Wood et al., 2002). To this end, the following sections will review the literature on the associations between these facets of internalizing distress and alcohol use among adolescents. Given that very few studies have examined the roles of specific types of internalizing symptoms and alcohol use among Hispanic youth, the discussion will focus on findings among adolescents in general.

Depression and Alcohol Use among Adolescents

A plethora of studies have found positive associations between depression and adolescent alcohol use and disorder (Abraham & Fava, 1999; Chassin et al., 1993; Crum

et al., 2008; Duncan, Alpert, Duncan, & Hops, 1997; Fleming, Mason, Mazza, Abbott, & Catalano, 2008; Hussong & Chassin, 1994; Kelder et al., 2001; Marmorstein, Iacono, & Malone, 2010). Evidence about this association has generally emanated from two lines of research. First, longitudinal studies have examined the relations between depressive symptomatology in adolescence and subsequent alcohol use (for a review, see Hussong et al., 2017). Second, some studies have used ecological momentary assessment to investigate the proximal associations between depressed mood and alcohol consumption.

Before a review of the findings about the relations between depression and alcohol use is possible, it is important to mention an important methodological consideration at the outset of this discussion. Although “sadness” and “depression” are often used synonymously in the mainstream media as extremes of one another (e.g., depression as extreme sadness), it is noteworthy that the diagnostic criteria for Major Depressive Disorder is quite heterogeneous. That is, depression encompasses symptoms such as sleep disturbances, weight gain/loss, irritability, and difficulty with concentration (APA, 2013). In fact, of the 9 symptoms currently listed in the DSM-V criteria for Major Depressive Disorder, only four directly measure sadness or lack of positive affect (APA, 2013). Thus, although evidence about the association between depressive symptomatology and alcohol use is informative, interpretation of such results should be made prudently, as it remains unclear to what extent *depressed mood* may actually be accounting for this association, relative to other symptoms.

This warning notwithstanding, at least 17 longitudinal studies have found that depressive symptomatology during early and middle adolescence is associated with

increased risk for later alcohol use and disorder (for a review, see Hussong et al., 2017). Indeed, depressed mood during early adolescence has been found to predict a range of alcohol use outcomes, including early onset and increased risk of alcohol initiation (Crum et al., 2008), alcohol-related problems (Marmorstein, 2009), and alcohol abuse/dependence (Marmorstein, Iacono, & Malone, 2010).

Importantly, in terms of the directionality of the relations between depressive symptomatology and alcohol use, longitudinal studies indicate that first onset of major depression almost always precedes first onset of alcohol use disorders (Merikangas et al., 2010). Among representative community samples, average age of onset of major depression and dysthymia is typically between 11 and 14 years (Cohen et al., 1993; Merikangas et al., 2010), whereas alcohol abuse and dependence tend to onset around 22 years old (NIAAA, 2007). Likewise, in clinically referred samples of youth, alcohol dependence has been found to follow the onset of first life depression by approximately five years (Abraham & Fava, 1999). However, it is important to mention that rather than being a simple unidirectional model, it is also possible that depression and alcohol use disorders may be distinct behavioral manifestations that stem from a common heritable disposition towards affective dysregulation (Merikangas, Risch, & Weissman, 1994; Merikangas et al., 1996).

In addition to longitudinal studies, another useful source of evidence are studies that have used more time-sensitive methods such as ecological momentary assessment. Ecological Momentary Assessment (EMA) is a research method that involves repeated collection of within-individual data typically many times per day in the natural

environment in attempt to sample real world experiences (Shiffman, Stone, & Hufford, 2008). Ecological momentary assessment is useful for several reasons. First, it enables researchers to capture the rapid interplay between state levels of negative mood and drinking behavior. Second, it allows for the establishment of temporal precedence.

Although there have been no EMA studies examining the role of negative affect on adolescent alcohol use, there have been a handful of studies that have investigated these associations among young adult populations (see Bhushan, Blood, & Shrier, 2013; Gorka et al., 2017; Hussong, Hicks, Levy, & Curran, 2001). Hussong, Hicks, Levy, and Curran (2001) used EMA to follow undergraduate students for 21 days where they were randomly asked at different times during the week and weekend to report levels of negative affect and alcohol consumption. This investigation found that sadness and hostility each uniquely predicted subsequent drinking, after controlling for other forms of negative and positive mood states. Likewise, in a daily diary study of college students, Flynn (2000) found significant associations between days characterized by heightened sadness and alcohol consumption.

Taken together, evidence from prospective investigations of adolescents and EMA studies of young adults indicate that depressed mood is associated with increased alcohol use both proximally and distally (Costello et al., 1996; Hussong, Hicks, Levy, & Curran, 2001; Rohde, Lewinsohn, & Seeley, 1996; Woodward & Fergusson, 2001; Zimmermann et al., 2003). Indeed, in a recent review paper on the effects of internalizing symptoms on alcohol use, Hussong et al. (2017) concluded that depression was the most consistently robust predictor of adolescent alcohol use and disorder.

Worry and Alcohol Use

Although anxiety is often treated as a unitary construct in research studies, psychometric investigations of anxiety measures support the existence of several distinct facets of anxiety, such as worry and social anxiety (Wood et al., 2002). Even though separate dimensions of anxiety may co-occur within the same individual, research has demonstrated that these symptoms are conceptually distinct from one another (Watkins, 2008). For example, worry is characterized as an unproductive, repetitive cognitive process that focuses on possible dangers and consequences of future events (Segerstrom, Tsao, Alden, & Craske, 2000). In contrast, social anxiety has been defined as a fear of interactions that involve other people due to concerns about being judged or scrutinized (APA, 2013).

Several researchers have underscored the importance of considering the multidimensional nature of anxiety when assessing its association with alcohol use. (Ciesla et al., 2011; Kaplow et al., 2001; Nichter & Chassin, 2015). Indeed, emerging evidence suggests different facets of anxiety are differentially associated with alcohol use (Nichter & Chassin, 2015; Parrish et al., 2016). For example, at least three studies provide evidence that worry symptoms are negatively associated with alcohol use and disorder among youth (Ciesla et al., 2011; Nichter & Chassin, 2015; Shoal, Castaneda, & Giancola, 2005). In a prospective study of high-risk male adolescents, Nichter and Chassin (2015) found that worry symptoms were associated with decreased odds for typical alcohol involvement, frequency of binge drinking, and alcohol dependence symptoms. Conversely, physiological anxiety symptoms were positively associated with

all alcohol use outcomes. Similarly, Ciesla and colleagues (2011) investigated the role of four types of internalizing symptoms (depressive rumination, angry rumination, co-rumination, worry) on weekly alcohol use and binge drinking among a sample of undergraduate students. In this study, angry rumination was defined as the tendency to think about angry thoughts and feelings, while co-rumination was characterized by excessive thought and discussion of problems with other people. Results indicated that while angry rumination and co-rumination predicted greater frequency of weekly drinking, worry predicted lower frequency of weekly alcohol consumption and decreased likelihood of binge drinking.

Theoretically, worry may be inversely related to alcohol use for several reasons. First, worry may be protective in that it involves recalling past events and thinking about how current behaviors may affect the likelihood of temporally distant negative outcomes. Second, it is possible that alcohol use may be a poor coping strategy for adolescents who exhibit heightened worry because it may exacerbate concerns about the possible negative effects of drinking (e.g., likelihood for impaired driving). For example, studies on adolescents with high levels of worry suggest that physical harm, personal health, and trouble with the law are primary concerns (Weems, Silverman, & La Greca, 2000).

At the diagnostic level, several studies have found significant associations between Generalized Anxiety Disorder and alcohol use among adolescents (Kaplow et al., 2001; Woodward & Fergusson, 2001; Zimmerman et al., 2001). Kaplow et al. (2001) found that overall number of GAD symptoms during late childhood predicted increased risk for initiation of alcohol use four years later. Likewise, in a prospective study of

adolescents followed into adulthood, Zimmerman and colleagues (2003) found that youth with a diagnosis of GAD were twice as likely to engage in hazardous alcohol use four years later.

There are several reasons why adolescents with GAD may be more likely to engage in alcohol use. Some scholars argue that youth with GAD may be more prone to use alcohol due to heightened concerns about being “left out” of social situations and/or increased desire to fit in with peer groups (Kaplow et al., 2001). Alternatively, other researchers have suggested that youth with GAD may use alcohol to self-medicate the physiological tension associated with the disorder (Robinson et al., 2009).

The positive association found between GAD and alcohol use is interesting in light of other findings demonstrating inverse relations between worry and alcohol use. Indeed, a hallmark characteristic of GAD is uncontrollable and irrational worry (APA, 2013). However, it is important to note that the diagnostic criteria for GAD also include symptoms of physiological anxiety as well (e.g., restlessness, tension). Moreover, there is some research to suggest that physiological symptoms of anxiety may be a stronger predictor of alcohol use relative to cognitive symptoms of anxiety (Parrish et al., 2016; Nichter & Chassin, 2015). For example, Parrish et al. (2016) found that anxious-arousal symptoms of anxiety, but not cognitive symptoms, predicted alcohol use among Mexican origin adolescents. However, very few studies have examined the association between different facets of anxiety and alcohol use, and future research is needed to address this gap in the literature. To this end, one of the goals of the present study was to investigate

the contribution of cognitive symptoms of anxiety (e.g., worry) on alcohol use among Mexican American youth.

Social Anxiety and Alcohol Use

Social anxiety is characterized as a fear of interaction with other people due to concerns about being negatively scrutinized, which may result in avoidance of social situations (APA, 2013). At high levels of severity, social anxiety can result in functional impairment that constitutes a clinical disorder referred to as Social Anxiety Disorder (SAD) (APA, 2013). Numerous studies have found that social anxiety symptomatology is positively related to alcohol use in adolescent and young adult populations (for a review, see Morris, Stewart, & Ham, 2005). For example, adolescents with SAD have been found to be twice as likely to engage in regular alcohol use and hazardous alcohol use compared to youth without SAD (Zimmerman et al., 2003).

Importantly, although social anxiety disorder is often comorbid with alcohol dependence among young adults, longitudinal studies indicate that social anxiety consistently precedes the onset of alcohol use disorders (Buckner et al., 2008). Thus, it has been theorized that some socially anxious youth may drink as a means offsetting of anxiety (Buckner et al., 2006). However, as is the case with other internalizing disorders, it is worth noting that just because SAD typically precedes alcohol use disorders temporally does not mean that SAD *causes* an alcohol use disorder. For example, it is plausible that a shared genetic influence manifests itself for both conditions at different ages.

Despite the fact that some studies find positive associations between SAD and alcohol dependence, there is also evidence that suggests that social anxiety may be inversely related to alcohol use among young adults (Morris, Stewart, & Ham, 2005). For example, in a study of college students, Ham and Hope (2005) found that social anxiety symptomatology was negatively related to problematic alcohol use. Likewise, Tran, Haaga, & Chambless (1997) found that socially anxious youth consumed alcohol less frequently and in less quantity than those with lower levels of social anxiety.

Researchers have offered several potential explanations for the mixed findings about social anxiety and alcohol use. First, as Morris, Stewart, & Ham (2005) note in their review, alcohol-related problems may be a more salient measure of drinking behavior among socially anxious individuals rather than frequency or quantity of alcohol use. This is because research suggests that socially anxious youth tend to avoid social situations (e.g., parties) because they find unstructured peer encounters highly distressing (Beidel & Morris, 1995). However, when socially anxious youth do attend social functions, they may be more likely to use alcohol as a means of coping and are therefore at higher risk for experiencing alcohol-related problems due to lack of experience with alcohol (Morris, Stewart, & Ham, 2005). Indeed, this may explain why social anxiety disorder has been found to be positively related to alcohol problems (Lewis & O'Neill, 2000), but negatively associated with drinking frequency among young adults (Eggleston et al., 2004).

In summary, there has been mixed evidence about the etiological relevance of social anxiety to alcohol use among youth (Eggleston et al., 2004; Lewis & O'Neill,

2000; Morris, Stewart, & Ham, 2005; Tran, Haaga, & Chambless, 1997). Some longitudinal studies indicate that adolescents with SAD are more likely to report problematic alcohol use during early adulthood (Zimmerman et al., 2003). However, other research indicates that social anxiety may be protective against alcohol use because socially anxious youth tend to be less embedded in peer contexts where adolescent drinking occurs (Dell'Osso et al., 2015; Eggleston et al., 2004).

Youth Cultural Orientation and Alcohol Use

Mexican origin youth often face the challenge of adapting to two different cultural contexts simultaneously—Mexican culture and mainstream US culture. That is, as Mexican American youth develop, they may experience socialization pressures to conform to one set of standards from their culture of origin, while also adapting to the mainstream culture of the United States (Gonzales et al., 2006). This dual cultural adaptation process has been defined as occurring through the processes of acculturation and enculturation (Gonzales et al., 2002). Acculturation has been defined as the process by which an individual adapts to a broader mainstream culture, while enculturation is the process by which an individual adapts to their ethnic culture (Gonzales et al., 2002).

Research indicates that the challenges posed by this process of dual cultural adaptation may cause Mexican American adolescents to be at high risk for alcohol use and a host of other externalizing behaviors (for a review, see Gonzales et al., 2002). Previous investigations examining the relationship between acculturation and alcohol use among Mexican American youth have utilized a variety of proxy measures for acculturation, such as language use, nativity, generation status, cultural preferences, and

ethnic identity, among others (Gonzales et al., 2004). Although acculturation has been operationally defined using a variety of methods, most studies show that higher levels of acculturation are associated with greater risk for drug and alcohol use (Barrera, Gonzales, Lopez, & Fernandez, 2004; Gonzales et al., 2002; Martinez et al., 2006; Pasch et al., 2006; Samaniego & Gonzales, 1999; Vega et al., 1998; Zamboanga, Raffaelli, & Horton, 2006). Indeed, linguistic assimilation, one of the most commonly used measures of acculturation, has been consistently linked to higher levels of alcohol and drug use among Hispanic youth (Epstein et al., 1996; Epstein, Doyle, & Botvin, 2003; Nielsen & Ford, 2001; Vega, Gil, & Zimmerman, 1993).

Although an in-depth exploration of the link between acculturation and substance use is beyond the scope of this review (for reviews, see Barrera et al., 2004; Gonzales et al., 2002), prior research has shown that several processes may at least partially mediate this association. Such processes include increased family conflict caused by parent-child acculturation gaps (Gonzales et al., 2006; Telzer, 2011), perceived discrimination (Brittian, Toomey, Gonzales, & Dumka, 2013), acculturative stress (Zamboanga et al., 2009), parental monitoring (Samaniego & Gonzales, 1999), self-esteem (Zamboanga et al., 2009), and parental discipline (Samaniego & Gonzales, 1999).

There is also some evidence to suggest the association between acculturation and alcohol use may be stronger in women than men (Alaniz, Treno, & Saltz, 1999; Castro, Stein & Bentler, 2009; Raffaelli et al., 2007). For example, in a sample of Mexican American college students, Raffaelli and colleagues (2007) found that linguistic acculturation was associated with increased alcohol use and misuse among Hispanic

women, but not men, after controlling for relevant covariates. Researchers hypothesize that gender differences in the association between acculturation and alcohol use may be due to separate gender-specific cultural norms surrounding alcohol use in Hispanic cultures (Raffaelli et al., 2007; Wahl & Eitle, 2008). Indeed, qualitative research has found that strong sanctions exist against alcohol use for women relative to men in Hispanic cultures (Gilbert & Collins, 1997). This theory is supported by empirical evidence which finds that less acculturated young Hispanic women are more likely to abstain from alcohol use, while young Hispanic men consume alcohol more regularly, regardless of acculturation status (Alaniz, Treno, & Saltz, 1999). Conversely, as Hispanic women become more acculturated, some evidence suggests that their alcohol use patterns tend to become more similar to those of non-Hispanic Caucasian women (Wahl & Eitle, 2010). However, it is important to note that this gender finding has not always been consistent (Delva et al., 2005; Zamboanga et al., 2006). For instance, Delva et al. (2005) found no gender differences in the prevalence of binge drinking in a nationally representative sample of Mexican American eighth grade students.

In contrast to the potential adverse effects of acculturation, there is also evidence that shows that identification with traditional Mexican American cultural values (e.g., enculturation) may serve to buffer the effects of stress on adolescent substance use (Germán, Gonzales, & Dumka, 2009; Soto et al., 2011). Qualitative research has found support for several core facets of traditional Mexican American cultural values, such as religion, traditional gender roles, *familism*, and parental respect (Knight et al., 2009). *Familism* has been identified as a particularly important core element of Hispanic culture,

and can be defined as a set of normative beliefs espoused by Latino populations that emphasizes the centrality of the family unit and stresses the support and obligations that family members owe to both nuclear and extended kin (Germán, Gonzales, & Dumka, 2009).

Mexican American adolescents' endorsement of familism has been found to be negatively associated with a range of substance use outcomes, such as cigarettes (Lorenzo-Blanco et al., 2013) drug use (Ramirez et al., 2004), and alcohol use (Castro, Stein, & Bentler, 2009). As researchers Germán, Gonzales, & Dumka (2009) theorize, internalization of familism values is expected to operate in a protective manner for adolescents "...by cementing strong bonds of attachment to the family unit and ensuring that the family is a strong source of guidance, even as developing adolescents become increasingly involved with peers and activities outside the home..... to the extent that an adolescent has close ties to the family and believes their behavior will reflect on the family unit, they may be less likely to conform with delinquent peers out of a fear of disappointing significant others" (Germán, Gonzales, & Dumka, 2009, p.2).

In conclusion, empirical evidence suggests the process of acculturation heightens Mexican American adolescents' risk for alcohol use (Gil, Wagner, & Vega, 2000; Gonzales et al., 2002). Conversely, enculturation may buffer the effects of stress on substance use among Latino youth (Gonzales et al., 2008; Germán, Gonzales, & Dumka, 2009; Stone & Meyler, 2006; Unger et al., 2002). Although a paucity of studies have examined whether acculturation/enculturation moderates the association between internalizing symptoms and adolescent substance use, extant evidence suggests these

variables may be important (Gonzales et al., 2017). To this end, the current study will investigate youth cultural orientation as a moderator of the association between internalizing distress and alcohol use among Mexican American youth.

Previous research indicates that as Mexican American adolescents acculturate, they tend to adopt more pro-substance use beliefs and attitudes, and may be more likely to use substances as a coping strategy when feeling distressed (Kulis, Marsiglia, & Hurdle, 2003; Sánchez et al., 2010). Prior work also shows that depression has been consistently linked to alcohol use among youth (Hussong et al., 2017), whereas the etiological relevance of worry and social anxiety remain more uncertain (Eggleston et al., 2004; Lewis & O’Neill, 2000; Morris, Stewart, & Ham, 2005; Nichter & Chassin, 2015; Tran, Haaga, & Chambless, 1997). Given the strong positive associations between depressed mood and alcohol use, it is anticipated that acculturation and enculturation may serve to potentiate and/or buffer the effects of depression on alcohol use. In contrast, it is expected that youth cultural orientation will be less relevant to the associations of alcohol use with worry and social anxiety.

The Present Study

The present study aims to better understand how internalizing distress contributes to alcohol use and misuse among a community sample of Mexican American adolescents. Although Mexican American youth report high rates of internalizing symptomatology and alcohol use, very few studies have examined the longitudinal associations between these behaviors. Moreover, most studies that have been conducted on this area of research have focused on the association between specific internalizing disorders and

alcohol use (Kaplow et al., 2001; Zimmerman et al., 2001). While these studies provide important descriptive data, they also fail to acknowledge that internalizing disorders are often highly correlated. Thus, it has remained unclear whether the association between internalizing disorders and alcohol use are unique to a particular type of internalizing disorder, or whether multiple internalizing disorders share common components which confer risk for alcohol use (Kushner et al., 2012). Indeed, some recent evidence suggests internalizing symptoms share common and unique components that are differentially associated with alcohol use (Kushner et al., 2012; Parrish et al., 2016; Pardee, Colder, & Bowker, 2014). However, there has been a dearth of studies that have examined these associations, and further investigation is warranted.

Taking into account the limitations of previous studies, the current study extends prior research in several ways. First, this study is one the first longitudinal studies to examine the contribution of internalizing distress to alcohol use among Mexican American adolescents. Second, the present investigation uses a bifactor modeling approach to disaggregate the common versus specific components of internalizing distress and examine their respective associations with alcohol use. Utilization of the bifactor model is helpful because it allows us to test whether different forms of internalizing distress share *common features* that confer risk for alcohol use, as well as whether there are *unique domain-specific features* that are more or less relevant to alcohol use. Disaggregating the common and unique components of internalizing distress will allow for a more comprehensive understanding of the etiological relevance of the internalizing pathway to alcohol use among Mexican American youth. A significant

strength of the current study is that we examine common and unique components of *distress symptoms* (e.g., depressed mood, worry) rather than focusing on *internalizing disorders*. Using this approach eliminates the possibility that a common factor might emerge simply because various internalizing disorders share overlapping diagnostic symptoms (e.g., fatigue, concentration difficulties, sleep problems).

Third, our study investigates the moderating role of cultural orientation (e.g., acculturation/enculturation) in the association between internalizing distress and adolescent alcohol use. Prior literature suggests acculturation may increase risk for substance use among Mexican American adolescents (Gonzales et al., 2002). Conversely, enculturation may buffer risk for adolescent substance use (Germán, Gonzales, & Dumka, 2009). The current study investigates whether the internalizing pathway to alcohol use may be more or less salient for Mexican American youth depending on their level of endorsement on two dimensions of cultural orientation (acculturation/enculturation).

Specific Aims and Hypotheses

Aim 1: Use a bifactor confirmatory factor analysis (CFA) model to disaggregate the general versus specific components of internalizing distress and examine their respective associations with alcohol use outcomes.

The following set of hypotheses will guide Aim 1:

1A. Confirmatory factor analyses will provide support for a bifactor model with a general factor and three specific factors. The three specific factors will represent depressed mood, general worry, and social anxiety.

1B. Measurement invariance testing will reveal that the factor structure of the proposed bifactor model does not differ significantly by gender.

1C. The general distress factor will predict increased past thirty day alcohol use and past three month binge drinking.

1D. Depressed mood will predict increased past thirty day alcohol use and past three month binge drinking.

1E. General worry will predict decreased past thirty day alcohol use and past three month binge drinking.

1F. Social anxiety will predict decreased past thirty day alcohol use and past three month binge drinking.

Aim 2: Investigate the moderating roles of youth cultural orientation in the association between the general and specific factors of internalizing distress and alcohol use outcomes.

The following set of hypotheses will guide Aim 2:

2A. Acculturation will moderate the association between the general factor of internalizing distress and alcohol use outcomes, with the effect of the general factor on alcohol use outcomes being stronger for adolescents with higher acculturation compared to those with lower acculturation.

2B. Acculturation will moderate the association between the specific factor of depressed mood and alcohol use outcomes, with the effect of depressed mood on alcohol use outcomes being stronger for adolescents with higher acculturation compared to those with lower acculturation.

2C. Acculturation will not moderate the association between the specific factor of general worry and alcohol use outcomes.

2D. Acculturation will not moderate the association between the specific factor of social anxiety and alcohol use outcomes.

2E. Enculturation will moderate the association between the general factor of internalizing distress and alcohol use outcomes, with the effect of the general factor on alcohol use outcomes being weaker for adolescents with higher enculturation compared to those with lower enculturation.

2F. Enculturation will moderate the association between the specific factor of depressed mood and alcohol use outcomes, with the effect of the depressed mood being weaker for adolescents with higher enculturation compared to those with lower enculturation.

2G. Enculturation will not moderate the association between the specific factor of general worry and alcohol use outcomes.

2H. Enculturation will not moderate the association between the specific factor of social anxiety and alcohol use outcomes.

Aim 3: Investigate the moderating role of gender in the association between the general and specific factors of internalizing distress and alcohol use outcomes.

The following set of hypotheses will guide Aim 3:

3A. Because prior research has yielded equivocal findings about the role of gender in the association between different forms of internalizing symptoms and adolescent

alcohol use, specific hypotheses will not be offered for this variable and will instead be treated as an exploratory moderator.

METHOD

Participants. Participants selected for the present study were from the fourth and fifth waves (representing 12th grade and approximately one year afterwards) of a larger longitudinal study investigating the role of culture and context in the lives of Mexican American families in a large southwestern metropolitan area, called the *La Familia Project* (Roosa et al., 2008). Participants and their families were recruited to participate in the original study (n=749) when the child was in 5th grade and were selected from ethnically diverse communities using school rosters. Families were deemed eligible to participate in the original study if they met the following criteria at the time of initial recruitment: (1) they had a target fifth grader attending a sampled school; (2) the participating mother was the child's biological mother, lived with the child, and self-identified as Mexican or Mexican–American; (3) the child's biological father was of Mexican origin; (4) the target child was not learning disabled; and (5) there was no step-father or mother's boyfriend currently living with the child. Families were assessed again two (7th grade), five (10th grade), seven (12th grade), and eight years later. The current study is based on the fourth and fifth waves of the *La Familia* study, representing 12th grade and approximately one year afterwards. For ease of reference, the 12th grade assessment point will be labeled as W1 and the next assessment point will be labeled as W2 in the current study.

In total, the sample consisted of 626 youth at W1 and 480 youth at W2. Participants were assessed at the W2 assessment period if (1) they were currently residing in the United States (not Mexico) at the time of data collection; (2) they were at least 18 years of age or older at the time of W2 (fifth follow-up period of the study); (3) they did not decline to complete the W2 phone assessment. See “Data Analytic Strategy” section for information regarding the attrition analyses that were conducted between W1 and W2. At W1, the mean age of participants was 17.37 (SD=.54) and 18.76 for W2 (SD=.59). Annual family incomes ranged from less than \$5,000 to more than \$95,000, with a mean of \$35,001 – \$40,000. The vast majority of adolescents (87%) were interviewed in English. Of the participant’s mothers, 70% were born in the United States and 31% completed their interviews for the study in English.

Recruitment. Using a combination of random and purposive sampling, the research team identified communities served by 47 public, religious, and charter schools from throughout the metropolitan area chosen to represent the economic, cultural, and social diversity of the city (see Roosa et al., 2008, for a full description of sampling methods). These schools were chosen from 237 potential schools in the metropolitan area with at least 20 Latino students in fifth grade, the target age group. Prior to selecting potential schools to include in the study, the cultural context of each of these communities was scored. Cultural context was operationalized using multiple indicators: (a) the Mexican–American population density; (b) the percentage of elected and appointed Latino office holders; (c) the number of churches providing services in Spanish; (d) the number of locally owned stores selling traditional Latino foods,

medicines, and household items; and (e) the presence of traditional Mexican-style stores (e.g., *carnicerías*). The score from each indicator was standardized and summed to create a community cultural context score. Next, the 237 school communities were arranged from lowest score to highest (i.e., from low to high levels of support for Mexican culture). The five “outliers”, on the high end of the scale, were selected because they represented particularly interesting living contexts (Mexican ethnic enclaves). Next, 25 additional schools were systematically selected from the remainder of this list by choosing a random starting point within the 10 lowest scores and selecting every 9th score (school) thereafter to represent the complete spectrum of community contexts. In total, 47 schools from 18 public school districts, the Catholic Diocese, and alternative schools were selected and organized into 42 distinct, noncontiguous communities. The communities sampled included semirural, suburban, urban, and inner city neighborhoods; 44.7% of schools were categorized as large urban schools, 6.4% midsize urban, 36.2% large suburb, 6.4% small suburb, 2.1 rural fringe, and 4.3% rural distant. The mean percent of students eligible for free/reduced lunch at these schools was 67.3% ($SD = 27.1$), with a low of 7.5% and a high of 100%. Proportion of Hispanics in these schools ranged from 15 to 98% with a mean of 70% ($SD = .237$). Recruitment materials (in English and Spanish) were sent home with all 5th grade children in selected schools that explained the research project and asked parents to indicate whether they were interested in participating. Interested families were screened if their ethnicity was Hispanic or they had Hispanic/Latino surnames. Over 85% of those who returned the recruitment materials were eligible for screening (e.g., Hispanic) and 1,028 met study eligibility criteria. In-

home Computer Assisted Personal Interviews were then scheduled; 749 families (mothers and child required, fathers optional) completed interviews, 73% of those eligible.

Cohabiting family members' interviews were conducted concurrently by professionally trained interviewers in different locations at their home. Interviewers read each survey question and possible response aloud in participants' preferred language to reduce problems related to variations in literacy levels. Participants were paid \$45 at Wave 1 and \$50 at Wave 2 for participation in the present study.

Measures. The measures utilized in this study were from a battery of measures from the *La Familia* Project. See Table 1 and 2 for descriptive statistics of all variables.

Internalizing distress. Internalizing distress symptoms were measured at Wave 1 in the current study via items from the *Diagnostic Interview Schedule for Children (DISC)*. The DISC is a structured interview developed for use with children and adolescents that assesses current and past symptoms, behaviors, and emotions (Shaffer et al., 2000). For the current study, past year internalizing symptoms were reported through endorsement of items from the following diagnostic modules: Major Depressive Disorder (depressed mood), Social Anxiety Disorder (social anxiety), and Generalized Anxiety Disorder (general worry). The DISC version corresponding to DSM-IV diagnostic criteria was used in this study (Shaffer, Fisher, & Lucas, 1998). The mood and anxiety modules from the DISC have been shown to have acceptable reliability across symptom counts (intraclass correlation coefficient = .66-.85) and criterion counts (intraclass correlation coefficient = .49-.91) and currently represent the gold standard in diagnostic assessment for children and adults (Shaffer, Fisher, Dulcan, & Davies, 1996).

Depressed mood—Adolescents self-reported symptoms of depressed mood using items from the Major Depressive Disorder module of the DISC. Depressed mood was comprised of two dichotomous items taken from the past year Major Depressive Disorder (MDD) diagnostic interview pertaining to depressed mood and/or lack of positive affect. Items included, “Was there a time in the last year when you felt sad or depressed for a long time each day that last almost every day?” and “In the last year, were there two weeks in a row when you felt nothing was fun almost every day?” Adolescents responded to each statement by indicating “Yes” or “No”, coded as 0 or 1. See Table 12 and 13 for frequencies of item endorsement. In total, 1.4% of females and .3% of males in the sample met DSM-IV diagnostic criteria for past year Major Depressive Disorder. For means of comparison, nationally representative data suggest that 8.9% of Hispanic adolescents aged 13-18 met past year criteria for DSM-IV Major Depressive Disorder (Avenevoli et al., 2015).

General worry— Adolescents self-reported symptoms of general worry using the Generalized Anxiety Disorder module of the DISC. General worry was comprised of five dichotomous items from the past year Generalized Anxiety Disorder diagnostic interview pertaining to past year worry symptoms. Sample items included, “In the last year, was there a time when you would worry even when you didn’t need to, say in a subject/about something at school, where you were well prepared and always did well?” and “In the last year, did you often worry a lot when you made small mistakes doing your homework or on other projects or activities?” Adolescents responded to each statement by indicating “Yes” or “No”, coded as 0 or 1. See Table 12 and 13 for item endorsement. In total, .5%

of females and 0% of males in the sample met DSM-IV diagnostic criteria for past year Generalized Anxiety Disorder. For means of comparison, nationally representative data suggest that 3.6% of Hispanic adolescents aged 13-18 met past year criteria for DSM-IV Generalized Anxiety Disorder (Burstein et al., 2014).

Social anxiety— Adolescents self-reported symptoms of social anxiety using the Social Anxiety Disorder module of the DISC. Social anxiety was comprised of six dichotomous items from the Social Anxiety Disorder (SAD) diagnostic interview module pertaining to past year social anxiety symptomatology. Sample items included, “Was there a time in the last year when you felt very nervous or uncomfortable almost every time you were with people you didn’t know well/were with a group of people/had to do things in front of other people?” and “In the last year, have you often felt very nervous or uncomfortable when you have been with a group of children/young people – say, like in the lunchroom at school or at a party?”. Adolescents responded to each statement by indicating “Yes” or “No”, coded as 0 or 1. See Table 12 and 13 for item endorsement. In total, 1.6% of females and .5% of males in the sample met DSM-IV diagnostic criteria for past year Social Anxiety Disorder. For means of comparison, nationally representative data suggest that 4.6% of Hispanic adults met past year criteria DSM-IV criteria (Polo, Alegria, Chen, & Blanco, 2011). Typical age of onset for SAD is 14.4 years old among Hispanic Americans (Polo, Alegria, Chen, & Blanco, 2011).

Past Month Alcohol Use. Frequency of past month alcohol use was measured at Wave 2 using an item from the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV). The AUDADIS-IV has undergone significant

psychometric evaluation to support its use as a reliable and valid assessment of self-reported alcohol use (Grant et al., 2003). Adolescents were asked to report on how many days they had consumed alcohol at one time during the past thirty days. See Table 1 and 2 for descriptive statistics for this variable. At Wave 2, 26% of females (n=70) and 31.6% of males (n=66) reported engaging in any past month alcohol use. For means of comparison, nationally representative data suggest that 39% of Hispanic 12th grade students engaged in past month alcohol use (Johnson et al., 2014).

Frequency of Binge Drinking. Frequency of past three month binge drinking was measured at Wave 2 using an item from the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV). Binge drinking has been defined by the National Institute of Alcohol Abuse and Alcoholism as consuming 5 or more drinks at one time for boys, or 4 or more drinks for girls (NIAAA, 2006). The present study utilized an item corresponding to the NIAAA definition for male pattern binge drinking, which asked youth to report how many times they had drunk five or more drinks at one time during the past three months. Response options included 1=not at all, 2= 1-2 times, 3= 3-5 times, 4= less than once a month, 5=1-3 times a month, 6=1-2 times a week, 7=3-5 times a week, 8= Everyday. See Table 1 and 2 for descriptive statistics of this variable. At Wave 2, 9.4% (n=25) of females and 16.2% (n=35) of males reported engaging in any past month binge drinking. For means of comparison, nationally representative data indicate that 22.4% of Hispanic 12th grade students engaged in past two week binge drinking (Johnson et al., 2014).

Current living status. Adolescent current living status was coded 0 (living at home with family) or 1 (living outside the home) at Wave 2. See Table 1 and 2 for descriptive statistics for this variable.

Baseline Covariates

Alcohol Use Problems. Past year alcohol use problems were measured in the current analyses at Wave 1 using the Alcohol Related Problems sub-scale of the DISC. Adolescents and mothers reported on youth's past year alcohol problems using dichotomous yes/no items asking about (1) whether recurrent use of alcohol resulted in a failure to fulfill major role obligations at work, school, or home (e.g., alcohol-related absences, suspensions, or expulsions from school); (2) there was alcohol use in situations in which it was physically hazardous (e.g., driving an automobile) (3) whether there were any alcohol-related legal problems (e.g., arrests for alcohol-related disorderly conduct); (4) there was recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol. Adolescents and mothers responded to each item by indicating "Yes" or "No", coded as 0 or 1, which were summed to yield a subscale score, with higher numbers indicating greater past year alcohol use problems. Adolescent and mother reports were averaged to yield a combined report of alcohol use problems. The acceptable reliability and validity of the DISC 4.0 and earlier versions have been well-described elsewhere (see Shaffer, Fisher, & Lucas, 2004).

Economic Hardship. Economic hardship was assessed at Wave 1 using items from the four economic hardship subscales developed by Barrera and colleagues (Barrera, Caples, & Tein, 2001). Mothers reported their subjective economic hardship using four

subscales reflecting Inability to Make Ends Meet (2 items), Not Enough Money for Necessities (7 items), Financial Strain (2 items), and Economic Adjustments/Cutbacks (9 items). The mean of the four subscales were computed to derive an economic hardship score, with higher scores reflecting greater economic hardship. In turn, this score was used to create a latent composite variable to represent subjective economic hardship. The decision to use mother's report of economic hardship versus a combined mother/father approach was made because mother and father reports of economic hardship were found to be highly correlated and therefore the mother's only report reflects a reliable indicator. The Economic Hardship scale was validated in prior research with Mexican–American parents (Barrera, Caples, & Tein, 2001) and demonstrated good reliability in the current sample, with cronbach's alpha .92 for mothers' and fathers' report. See Table 1 and 2 for descriptive statistics for this variable.

Conduct problems. Mothers and children separately completed the Conduct Disorder Module of the DISC. Mothers and children were asked to report about youth's lifetime engagement in conduct disorder behaviors, such as physical assault, possession of a weapon, firesetting, gang behaviors, sexual assault, and prior history of being in jail/detention. Lifetime conduct disorder symptoms were assessed at Wave 1. Mother and child report were averaged to yield a combined report of lifetime conduct disorder symptoms. The acceptable reliability and validity of the C-DISC 4.0 modules have been well-described elsewhere (Shaffer, Fisher, & Lucas, 2004). See Table 1 and 2 for descriptive statistics for this variable.

Youth cultural orientation. Acculturation and enculturation were assessed in the current study using the Mexican American Cultural Values Scale (MACVS; Knight et al., 2010). At Wave 1, youth reported to what extent they were oriented towards mainstream values (acculturation) and Mexican American values (enculturation). The MACVS items were developed through focus groups with Mexican American mothers, fathers, and adolescents. Adolescent indicated their endorsement of each item by responding with a 5-point Likert-type scale ranging from (1) not at all to (5) very much. Total enculturation was calculated by the mean score across 36 items from the six Mexican American value subscales: familism-support, familism-obligation, familism-referents, respect, religiosity, and traditional gender roles. Total acculturation was calculated as the mean score across 14 items from the three mainstream value subscales: material success, independence/self-reliance, and competition/personal achievement. The Cronbach alphas were 0.89 and 0.83 for the Mexican American values and mainstream values scales, respectively. See Table 1 and 2 for descriptive statistics for this variable.

Nativity. Adolescent nativity was coded 0 (U.S.-born) and 1 (Mexico-born) based on maternal report at Wave 1. See Table 1 and 2 for descriptive statistics for this variable.

DATA ANALYTIC STRATEGY

Establishing the Measurement Model

The overall goal of the present study was to examine the role of common and specific components of internalizing distress and their respective associations with alcohol use. In order to confirm that a bifactor structure provided the best fitting model for the present data relative to other possible models, a series of competing factor models

were assessed using confirmatory factor analysis measured by goodness of fit indices. The goal of this approach was to model the different possible interrelationships among all internalizing symptom items included in the present study. In total, three competing factor models were tested: one three factor multidimensional confirmatory factor analysis, a higher-order factor model, and a bifactor model. All models were estimated in *Mplus* version 7.3 (Muthén & Muthén, 2013).

In terms of the multidimensional CFA, the model specified three latent factors pertaining to different facets of internalizing distress: depressed mood, general worry, and social anxiety. See Figure 2 for a graphical display of this model. The decision to disaggregate anxiety into general worry and social anxiety was made because prior psychometric studies have yielded empirical support for the discriminant validity of generalized anxiety disorder and social anxiety disorder (see Brown, Chorpita, & Barlow, 1998). Next, a bifactor model was tested, comprised of a general distress factor and three specific factors representing unique facets of internalizing distress: depressed mood, general worry, and social anxiety. See Figure 3 for a graphical display of this model. Lastly, a higher-order factor model was tested consisting of 3 first-order factors (depressed mood, general worry, social anxiety) subsumed by a single higher-order factor (general distress). See Figure 4 for a graphical display of this model. All data were analyzed using robust weighted least squares (WLSMV), treating item-level data as categorical. Models were scaled by setting factor variances to one.

Model fit was assessed as per model fit criteria suggested by Hu and Bentler (1999). For the CFI and TFI, values < 0.9 were considered to indicate poor fit, values >

0.9 and < 0.95 were considered to indicate acceptable fit, and values > 0.95 were considered to indicate excellent fit. For the RMSEA, values > 0.08 were indicative of poor fit, values > 0.05 and < 0.08 were indicative of acceptable fit, and values < 0.05 were indicative of excellent fit. The χ^2 and RMSEA are indices of overall model fit, with the RMSEA providing an index of the discrepancy in model fit per degree of freedom. RMSEA less than .08 indicate a good fit to the data, while values less than .05 indicate a very good fit (Hu & Bentler, 1995; Hooper, Coughlan, & Mullen, 2008). Measurement invariance across gender was conducted for the measurement model. Evidence of measurement invariance across men and women indicates that the same set of indicators assesses the same construct in both groups.

Predicting Alcohol Use Outcomes from Common and Specific Factors

In order to avoid convergence problems due to the complexity of the measurement model, latent factors scores from the general and specific factors were generated and saved in *Mplus* using the FSCORES command, and were used in all subsequent path analyses in *Mplus*. An alpha level of .05 was used to determine significance. Hypothesized effects that were significant at $p < .10$ were considered marginally significant and were interpreted with caution. Continuous variables were centered prior to conducting regression analyses to enhance interpretability and to reduce nonessential multicollinearity (Cohen, Cohen, West & Aiken, 2003).

For means of comparison across the boys and girls models, baseline covariates that had been previously empirically shown to be predictive of adolescent alcohol use were kept in all models for boys and girls, respectively. The inclusion of covariates may

increase the power of a statistical test by minimizing uncontrolled variability, accounting for variance that would otherwise be thought of as error. In testing the study hypotheses, the following were used as covariates because of their hypothesized associations with the outcome variables of theoretical interest based on prior empirical studies: adolescent nativity, current living situation, economic hardship, prior alcohol use problems, and conduct problems. In order to ensure the predictive effects of the latent factor scores of internalizing symptoms on the alcohol outcomes were homogenous across the levels of the covariate, interactions were tested with each covariate.

Non-hypothesized covariate by predictor interactions were retained if they had a significant p -value after controlling for the false discovery rate (FDR) (Benjamini & Hochberg, 1995). The FDR approach controls for the expected proportion of falsely rejected null hypotheses (i.e., Type 1 errors). FDR-adjusted p -values were computed using the “FDR” option under the “PROC MULTTEST” procedure in SAS. Non-hypothesized interactions that had an FDR-adjusted p -value less than .05 in preliminary analyses were included in the final models.

Because there were a large number of alcohol abstainers in the sample, a standard Poisson model, negative-binomial model, and zero-inflated Poisson model were compared using log-likelihood, AIC, and BIC for both outcomes to determine which model best fit the data (Cox, West, & Aiken, 2009). For comparisons between these different methods for modeling count data, which tends to be highly skewed, please refer to the subsection of the Results section titled “Determining the Analytic Method for Count Outcomes.”

A model building approach was used to examine the relations between the general factor and each specific factor and alcohol use outcomes using structural equation modeling (SEM). The SEM model was tested in the following order. First, a series of regression models were run which tested the influence of the latent factor scores on past month alcohol use and past three month binge drinking, running separate regressions for each alcohol use outcome on the latent factor scores with no covariates in the models. Second, a series of regressions examining the associations between the latent factor scores on past month alcohol use were run, controlling for baseline covariates. Similarly, a series of regressions were run that examined the associations between the latent factor scores on past three month binge drinking, controlling for baseline covariates. Third, a series of regressions examined whether the relations among factor scores on the latent variables and alcohol use outcomes were moderated by youth cultural orientation (acculturation and enculturation). Models testing the interactions between the factor scores on the latent variables and acculturation/enculturation were tested in separate models one at a time.

Preliminary analysis

Preliminary analyses were conducted to examine 1) descriptive statistics on all study variables and covariates; 2) zero-order correlations among all predictors, and covariates; and 3) attrition between the current sample and prior waves of the original study. Descriptive statistics on all study variables and covariates are listed for the boys and girls models in Table 1 and Table 2.

Table 3 presents the zero-order correlations among all predictors and covariates among female participants. Comparisons between two dichotomous variables were estimated using phi coefficients rather than Pearson correlation coefficients (Kaplan & Saccuzo, 2012). Given that correlations are not relevant for count outcomes, alcohol use outcomes were dichotomized to give a better sense of their zero-order relations. Composite scores were computed for each form of internalizing symptom based on the means of the summed items. Several correlations are worthy of note. Being born in Mexico was positively associated with greater economic hardship ($r=.21, p<.01$). Economic hardship was positively associated with conduct problems ($r=.11, p<.05$). Being born in the U.S. was positively associated with acculturation ($r=.12, p<.05$).

Table 4 presents the zero-order correlations among all predictors, outcomes, and covariates among male participants. Depressed mood was positively associated with conduct problems ($r=.24, p<.01$). Depressed mood was positively associated with prior alcohol use problems ($r=.30, p<.01$). Acculturation was positively associated with conduct problems ($r=.12, p<.05$). Enculturation was associated with living with family ($r=-.14, p<.05$). Conduct problems were positively associated with prior alcohol use problems ($r=.51, p<.01$).

Two sets of attrition analyses were conducted in the boys and girls subsamples. See Tables 5 – 8 for attrition analyses. In the first set, analyses compared adolescents retained in the subsample at Wave 4 (of the original *La Familia* study) with those that did not complete the Wave 4 data collection on Wave 1 (baseline) study variables. The goal of this set of analyses was to determine the representativeness of the sample used in the

current study relative to the original sample. In the second set, analyses compared adolescents retained at Wave 5 with those that did not complete the Wave 5 data collection on Wave 1 study variables to determine the representativeness of adolescents retained at Wave 5 from the original study, and on Wave 4 study variables to determine those that dropped between Waves 4 and 5 in the current study. With only one exception, child nativity among girls, results showed no significant differences. Female adolescents who dropped out from Wave 4 to Wave 5 of the original study were more likely to be born in the US ($\chi^2 (1) = 3.76, p = .038$).

RESULTS

Establishing the Measurement Model

Confirmatory factor analyses revealed that the multidimensional CFA, higher-order model, and bifactor model with three specific factors fit the data similarly well, as per multiple fit indices. Table 9 provides fit statistics for the competing factor models. Given the similarities in model fit between the bifactor and higher order models, the bifactor model was deemed the most appropriate model to use for the current study for a number of theoretical and interpretational reasons. First, given the high correlations between some of the indicators of the latent factors in the three factor multidimensional model (e.g., depressed mood and worry, $r=.68, p<.001$) there would likely be significant problems with prediction due to multicollinearity issues. Second, higher-order models do not easily allow for the prediction of outcomes from the lower-order factors (e.g., depressed mood, general worry) (Chen, West, & Sousa, 2006). Given that the central purpose of this study was to examine (1) whether a general distress factor underlies

different forms of internalizing symptoms, and (2) whether unique forms of internalizing distress predict adolescent alcohol use, a bifactor model was deemed the most suitable analytic method for the present analyses.

Next, measurement invariance by gender was assessed to determine whether there was equivalency in the latent structure across male and female participants. In the first step, configural invariance of the bi-factor structure was tested across males and females. Configural invariance tests if the same factor structure fits the data for both males and females (Millsap & Tein, 2004). The configural invariance model resulted in a non-positive definite residual matrix and a reliable solution could not be determined because of the low endorsement rate for some items for boys or girls (i.e., only 3.1% of participants endorsed one of the depressed mood items for boys). Therefore invariance testing was halted at this step and the separate models were fitted to males and females separately.

Examined separately by gender, the bifactor model comprised of a general factor and three specific factors representing depressed mood, worry, and social anxiety provided good fit to the data for both the boys [$\chi^2 (53) = 54.32, p < .05$; CFI = .99; RMSEA = .00; WRMR = .62] and girls models [$\chi^2 (53) = 49.93, p > .05$; CFI = 1.0; RMSEA = .00; WRMR = .56]. The measurement model for the higher-order model also suggested good fit to the data for the boys [$\chi^2 (77) = 114.00, p < .05$; CFI = .98; RMSEA = .04; WRMR = 1.01] and girls models [$\chi^2 (65) = 61.73, p > .05$; CFI = 1.0; RMSEA = .01; WRMR = .70]. Confirmatory factor analysis for the multidimensional three factor CFA would not run because of problems with model convergence. See Table 10 and 11

for fit statistics for the competing factor models for the girls and boys models, respectively. Due to similar model fit and the aforementioned theoretical rationale for employing the bifactor model over the higher-order model, a bifactor modeling approach was chosen for the present analyses. The pattern of item loadings on each factor is provided in Tables 12 and 13 for the boys and girls models, respectively. A depiction of the final measurement model is displayed in Figure 3.

Determining the Analytic Method for Count Outcomes

Analyses for the present study consisted of two dependent variables that were counts: past month alcohol use and past three month binge drinking. Count variables consist of non-negative integers, which tend to be positively skewed and better approximated by a Poisson or negative binomial distribution rather than a normal distribution (Atkins et al., 2013). For the boys, past month alcohol use (69% zeros) and past three month binge drinking (80% zeros) displayed an excess number of zeros. For the girls, past month alcohol use (74% zeros) and past three month binge drinking (87% zeros) also displayed an excess number of zeros.

A series of analyses were conducted in order to determine which method of model estimation was most appropriate for each count dependent variable. Model fit was compared using the log-likelihood (LL), Akaike information criteria (AIC), and Bayes information criteria (BIC). Smaller values of log-likelihood, AIC, and BIC indicate better fit to the data. Because some evidence suggests that the BIC performs best of the information criterion indices (Nylund, Asparouhov, & Muthén, 2007), BIC was prioritized. The AIC and BIC can be used to compare non-nested models.

Results of the model fit indices for the girls models are presented in Table 14. A negative binomial, zero-inflated Poisson model, and a standard Poisson model were fit to past month alcohol use, and the negative binomial model produced better fit to the data (LL= -2532.256, AIC = 5158.511 and BIC = 5335.769 for the negative binomial vs. LL= -2627.529, AIC = 5347.058 and BIC = 5520.544 for the standard Poisson model). A negative binomial, zero-inflated Poisson model, and a standard Poisson model were also fit to past three month binge drinking outcome. In this case, the standard Poisson model produced better fit to the data (LL= -2379.949, AIC = 4853.898 and BIC = 5031.156 for the Poisson model vs. LL= -2381.518, AIC = 4855.035 and BIC= 5028.522 for the negative binomial model).

For the boys models, results of the model fit indices for all models tested are presented in Table 15. A negative binomial, zero-inflated Poisson model, and a standard Poisson model were fit to past month alcohol use, and the negative binomial model produced better fit to the data (LL= -2666.858, AIC = 5427.715 and BIC = 5602.724 for the negative binomial vs. LL= -2738.785, AIC = 5569.570 and BIC = 5740.855 for the standard Poisson model). A negative binomial, zero-inflated Poisson model, and a standard Poisson model were also fit to past three month binge drinking, and the negative binomial model once again produced better fit to the data (LL= -2576.922, AIC = 5247.843 and BIC = 5422.852 for the negative binomial vs. LL= -2738.785, AIC = 5283.026 and BIC= 5454.311 for the standard Poisson model).

In summary, results favored the negative binomial over the ZIP and Poisson models for the boys 30 day alcohol use and three month binge drinking, respectively. For

the girls models, results favored the negative binomial model for 30 day alcohol use and the standard Poisson model for past three month binge drinking.

Effect of Common and Specific Factors on Past Month Alcohol Use among Girls

A series of negative binomial models² tested the influence of the latent factor scores on Wave 2 past month alcohol use, over and above baseline covariates. Maximum likelihood estimation was used to handle the missing data in the model (Enders, 2010). Therefore, the full sample³ was included in model testing. Preliminary analyses were conducted to test for significant covariate by predictor interactions. FDR-adjusted p -values were used for these preliminary analyses. There was a significant non-hypothesized depressed mood by prior alcohol use problems interaction predicting past month alcohol use ($B= -.680$, $SE=.33$, FDR-adjusted $p= .043$, $IRR=.50$). Thus, the final model included five covariates, two moderator variables, and one covariate by predictor interaction: nativity, current living situation, economic hardship, conduct problems, prior alcohol use problems, enculturation, acculturation, and the interaction between depressed mood and prior alcohol use problems.

Results of the final model testing the influence of the latent factor scores on past month alcohol use are presented in Table 16. There was a marginally significant main effect of the latent factor score of depressed mood on past month alcohol use ($b= .779$, $SE= .45$, $p<.05$, $IRR=2.17$), over and above the covariates, such that higher levels of

² Negative binomial and standard Poisson regression coefficients indicate how much the log of the expected count of the dependent variable is expected to change for a 1 unit increase in the predictor. Negative binomial and Poisson regression coefficients can be exponentiated in order to obtain incidence rate ratios (*IRRs*). The *IRR* indicates the extent to which the log of the expected count of the dependent variable is expected to increase or decrease for a 1 unit change in the independent variable. For example, an *IRR* of 1.25 would signify that for every one unit increase in the predictor, there is a 25 percent increase in the dependent variable.

³ The full sample included all participants with data at Wave 4 of the original study.

depressed mood were associated with greater past month alcohol use. Prior alcohol use problems significantly predicted past month alcohol use ($b = .312$, $SE = .10$, $p < .01$, $IRR = 1.36$), such that alcohol use problems predicted increased past month alcohol use. Nativity predicted past month alcohol use ($b = -.805$, $SE = .35$, $p < .05$, $IRR = .44$), such that girls who were born in the United States were significantly more likely to engage in past month alcohol use compared to girls born in Mexico.

A significant non-hypothesized two-way interaction was found between the latent factor score of depressed mood and prior alcohol use problems ($b = -.680$, $SE = .33$, $p < .05$, $IRR = .50$). To probe this interaction further, the relationship between depressed mood and past month alcohol use was examined at 1 standard deviation above the mean of prior alcohol problems, 1 standard deviation below the mean of prior alcohol problems, as well as at the mean of prior alcohol problems. Simple slopes were then calculated based on the results of these three regressions. The simple slope regression for 1 SD above the mean of prior alcohol problems was non-significant ($b = .112$, $SE = 0.40$, $p = .462$, $IRR = 1.11$) and 1 standard deviation below the mean was significant ($b = 1.44$, $SE = 0.68$, $p = .036$, $IRR = 4.22$). This interaction suggests that for participants with low levels of prior alcohol problems, higher levels of depressed mood were significantly related to increased frequency of past month alcohol use. See Figure 6 for a graphical display of this interaction.

Examining Moderation by Cultural Orientation

In order to test moderation by youth cultural orientation, separate regression models were run which tested the interaction of each latent factor score and

acculturation/enculturation on past month alcohol use, testing each interaction term in models one at a time. A significant two-way interaction was found between the general internalizing distress factor and acculturation ($b=1.39$, $SE=.56$, $p<.05$, $IRR=4.01$). Results of the negative binomial model testing this interaction are presented in Table 17. To probe this interaction further, the relationship between the general factor and past month alcohol use was examined at 1 standard deviation above the mean of acculturation, 1 standard deviation below the mean of acculturation, as well as at the mean of acculturation. Simple slopes were then calculated based on the results of these three regressions. The simple slope regression for 1 SD above the mean of acculturation was non-significant ($b= .282$, $SE= 0.46$, $p= .545$, $IRR=1.32$) and 1 standard deviation below the mean was significant ($b= -1.19$, $SE= 0.50$, $p= .018$, $IRR=.30$). This interaction suggests that for girls with low levels of acculturation, general internalizing distress was significantly related to decreased frequency of past month alcohol use. See Figure 7 for a graphical display of this interaction.

Acculturation did not moderate the association between the latent factor scores of any of the specific factors and past month alcohol use. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and acculturation on past month alcohol use, only the results of the significant general factor interaction are presented in the text, as the results from the remaining models were non-significant. Likewise, enculturation did not significantly moderate the association between any of the latent factor scores and past month alcohol use. Results of the model testing the non-significant interactions between the latent factor score of the general

factor and enculturation on past month alcohol use are presented in Table 18. All other models testing the interaction between the latent factor scores of the specific factors and enculturation on past month alcohol use were non-significant and therefore were not listed in the text.

Effect of Common and Specific Factor on Binge Drinking among Girls

A series of Poisson regression models tested the influence of the latent factor scores on Wave 2 past three month binge drinking, over and above the covariates. No significant covariate by predictor interactions were found in preliminary analyses after p -values were FDR-adjusted in preliminary analyses. The final model included five covariates and two moderator variables: conduct problems, prior alcohol use problems, nativity, economic hardship, current living situation, enculturation, and acculturation. Results of the final model testing the influence of the latent factor scores on past three month binge drinking are presented in Table 19. There were no significant main effects found of the latent factor scores on past three month binge drinking, over and above covariates. Conduct problems predicted past three month binge drinking ($b = .236$, $SE = .11$, $p < .05$, $IRR = 1.26$), such that conduct problems were associated with greater binge drinking. Prior alcohol use problems also predicted binge drinking ($b = .277$, $SE = .09$, $p < .01$, $IRR = 1.31$). Results showed that enculturation predicted less binge drinking ($b = -.600$, $SE = .28$, $p < .05$, $IRR = .54$). Acculturation predicted binge drinking ($b = .859$, $SE = .32$, $p < .01$, $IRR = 2.36$), such that girls with higher acculturation were more likely to engage in binge drinking compared to those with lower acculturation. Living outside the family

home was marginally significant in predicting binge drinking ($b=.371$, $SE=.214$, $p<.10$, $IRR=1.44$).

Examining Moderation by Cultural Orientation

Acculturation did not moderate the association between the latent factor scores of the general or any of the specific factors and binge drinking. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and acculturation on past three month binge drinking, only the results of the non-significant general factor interaction are presented in Table 20. Likewise, enculturation did not significantly moderate the association between the latent factor scores of the general or any of the specific factors and binge drinking. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and enculturation on past three month binge drinking, only the results of the non-significant general factor interaction are presented in Table 21.

Effect of Common and Specific Factors on Past Month Alcohol Use among Boys

A series of negative binomial regression models tested the influence of the latent factor scores on past month alcohol use, over and above the covariates. No significant covariate by predictor interactions were found in preliminary analyses after p -values were FDR-adjusted. The final model included five covariates and two moderator variables: conduct problems, prior alcohol use problems, nativity, economic hardship, enculturation, acculturation, and current living situation. Results of the final model testing the influence of the latent factor scores on past three month binge drinking are presented in Table 22. As illustrated in Table 22, there were no significant main effects of the latent factor

scores on past month alcohol use, over and above the covariates. Conduct problems predicted past month alcohol use ($b = .149$, $SE = .07$, $p < .05$, $IRR = 1.16$), such that conduct problems were positively associated with past month alcohol use. Prior alcohol use problems predicted increased past month alcohol use ($b = .145$, $SE = .07$, $p < .05$, $IRR = 1.15$).

Examining Moderation by Youth Cultural Orientation

In order to test moderation by youth cultural orientation, separate models were run which tested the interaction of each latent factor score and youth cultural orientation on past month alcohol use. A significant two-way interaction was found between the general internalizing distress factor and acculturation ($b = .966$, $SE = .48$, $p < .05$, $IRR = 2.62$). Results of the negative binomial model testing this interaction are presented in Table 23. To probe this interaction further, the relationship between the general factor and past month alcohol use was examined at 1 standard deviation above the mean of acculturation, 1 standard deviation below the mean of acculturation, as well as at the mean of acculturation. Simple slopes were then calculated based on the results of these three regressions. The simple slope regression for 1 SD above the mean of acculturation was non-significant ($b = .286$, $SE = 0.33$, $p = .395$, $IRR = 1.33$) and 1 standard deviation below the mean was significant ($b = -.797$, $SE = 0.39$, $p = .045$, $IRR = .52$). This interaction suggests that for boys with low levels of acculturation, higher levels of the general internalizing distress were significantly related to less past month alcohol use. See Figure 8 for a graphical display of this interaction. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and acculturation

on past month alcohol use, only the results of the non-significant general factor interaction are presented in Table 23. Likewise, enculturation did not significantly moderate the association between the latent factor scores of the general or any of the specific factors and past month alcohol use. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and enculturation on past month alcohol use, only the results of the non-significant general factor interaction are presented in Table 24.

Effect of Common and Specific Factors on Binge Drinking among Boys

A series of negative binomial regression models tested the influence of the latent factor scores on past three month binge drinking, over and above the covariates. No significant covariate by predictor interactions were found in preliminary analyses after p -values were FDR-adjusted. The final model included five covariates and two moderator variables: conduct problems, prior alcohol use problems, nativity, economic hardship, current living situation, enculturation, and acculturation. Results of the final model testing the influence of the latent factor scores on past three month binge drinking are presented in Table 22. There was a marginally significant main effect of the latent factor score of social anxiety on binge drinking ($b=-.390$, $SE=.22$, $p<.10$, $IRR=.67$), over and above the covariates, such that social anxiety was associated with decreased binge drinking. Conduct problems predicted binge drinking ($b= .200$, $SE= .08$, $p<.05$, $IRR=1.22$), such that conduct problems were associated with greater binge drinking. Prior alcohol use problems predicted greater binge drinking ($b= .108$, $SE= .05$, $p<.05$, $IRR=1.11$). Nativity predicted binge drinking ($b= .782$, $SE= .33$, $p<.05$, $IRR=2.18$), such

that boys that were born in Mexico engaged in greater binge drinking compared to those born in the United States.

Examining Moderation by Cultural Orientation

Acculturation did not moderate the association between the latent factor scores of the general or any of the specific factors and binge drinking. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and acculturation on past three month binge drinking, only the results of the non-significant general factor interaction are presented in Table 23. Likewise, enculturation did not significantly moderate the association between the latent factor scores of the general or any of the specific factors and binge drinking. Although separate models were run which tested the influence of the interaction of each of the latent factor scores and enculturation on binge drinking, only the results of the non-significant general factor interaction are presented in Table 24.

DISCUSSION

The overall purpose of this study was to use an innovative approach of bifactor modeling to obtain greater clarity about the hierarchical nature of internalizing distress and its relation to alcohol use among Mexican-American youth. Specifically, this study tested whether different forms of internalizing distress are composed of common and unique components, whether and to what extent such components confer risk for alcohol use, and whether youth cultural orientation may play a role in these associations.

In accordance with our central hypotheses, the first major finding of this study was that the bifactor model with a general factor and three specific factors provided good

fit to the data in both the boys and girls models. The bifactor model included a general factor, reflecting the covariance among all internalizing distress items, and three specific factors representing depressed mood, general worry, and social anxiety. The specific factors found in our study were theorized to reflect unique variance associated with each form of internalizing distress. These results are consistent with those of previous investigations that suggest that a higher-order distress factor underlies multiple forms of internalizing symptoms (Brodeck et al., 2014; Ebesutani et al., 2011; Lahey et al., 2016; Krueger & Eaton, 2015; Kushner et al., 2012; Simms et al., 2008; Thomas et al., 2012). It is hypothesized that this superordinate factor may represent a broad risk factor for experiencing multiple forms of unspecified psychological distress.

One significant strength of the current study was that it examined common and specific components of *internalizing distress symptoms*, rather than focusing on shared variance within *internalizing disorders*, as some studies have done in the past (e.g., Kushner et al., 2012). By using this strategy, we were able to test whether different forms of internalizing distress (e.g., depressed mood, general worry) share a common distress component that is not simply an artifact of shared diagnostic symptoms (e.g., fatigue, concentration problems). Indeed, as Lahey et al. (2016) noted in a recent review, one methodological limitation of prior studies examining the hierarchical factor structure of internalizing disorders is the possibility that a common factor emerged simply because internalizing disorders share overlapping diagnostic items (e.g., inflated common-method variance).

Current findings indicate that different forms of internalizing distress share a distress component that *is not* simply an artifact of overlapping diagnostic symptoms. These results are significant because they suggest that different phenotypic dimensions of internalizing distress may have shared underlying causes. One possibility is that a causal influence (e.g., a set of genetic variants or life experience) may directly influence multiple dimensions of internalizing psychopathology (Lahey et al., 2016). Alternatively, it is also possible that experiencing one form of internalizing distress may serve as a risk factor for the other that may unfold over time (Cummings, Caporino, & Kendall, 2014).

Effect of General Internalizing Distress Factor on Alcohol Use

The second major finding from this study was about the association between the general factor of internalizing distress and alcohol use. Findings revealed that the general distress factor was significantly associated with past month alcohol use. Yet, these effects were conditional on level of acculturation. Results indicated that at low levels of acculturation, general internalizing distress was negatively associated with past month alcohol use for both boys and girls. More specifically, the incidence rate ratio indicated that among adolescents with low levels of acculturation, each one-unit increase in general internalizing distress corresponded to a 52 and 30 percent decrease in past month alcohol use among boys and girls, respectively. However, at high levels of acculturation, there was a trend in the data (see Figure 7 and 8) for general internalizing distress to be positively related to past month alcohol use, although this effect did not reach significance. It is noteworthy to mention that these effects were above and beyond the variance accounted for by a variety of theoretically-relevant covariates, including conduct

problems, prior alcohol use problems, and economic hardship. These findings are consistent with a large body of prior literature which underscores the important role that acculturative processes play on alcohol consumption among Mexican American youth (Gonzales et al., 2002; Gonzales et al., 2017; Schwartz et al., 2014).

Theoretically, less acculturated Mexican American youth may be less likely to use alcohol as a coping strategy when distressed for several reasons. First, adolescents with low levels of acculturation may be less embedded in social contexts in which alcohol use is readily available. Most adolescent alcohol use in mainstream U.S. culture occurs in social contexts (e.g., parties, social events) where it is believed that use may help facilitate new friendships, romantic/sexual relations, or social bonding (Schulenberg & Maggs, 2002). However, empirical evidence suggests that less acculturated Mexican American adolescents tend to associate with other similarly less acculturated peers and are more likely to live in ethnic enclaves (Kulis et al., 2007; Weisskirch & Alva, 2002). Research also suggests living in ethnic enclaves is a protective factor against substance use for Latino adolescents, perhaps because of different social norms governing alcohol use (Kulis et al., 2007; Vega & Gil, 1998). Indeed, in his review on the effects of acculturation on substance-using behaviors among Latinos, De la Rosa (2002) suggested that in traditional Latino culture, alcohol use typically occurs during celebrations and family gatherings, but there are strong social sanctions against heavy drinking, particularly among women. Therefore, not only are less acculturated Mexican American youth less likely to be involved in peer contexts where alcohol is present (e.g., less

access), but they also may be less likely to use alcohol as a coping strategy because they may view it as less normative.

Second, less acculturated Mexican American adolescents have been found to espouse greater anti-substance use attitudes and beliefs relative to their more acculturated counterparts (Kulis, Marsiglia, & Hurdle, 2003). Evidence indicates that as Mexican American adolescents acculturate, they tend to adopt more pro-substance use attitudes (Kulis, Marsiglia, & Hurdle, 2003). Third, less acculturated youth are more likely to rely on adaptive forms of coping such as relying on family support, which may buffer the effects of psychological distress on alcohol use (Villarruel et al., 2014). Conversely, acculturated Mexican American youth are more likely to use maladaptive coping styles such as avoidant coping relative to less acculturated youth (Sánchez et al., 2010). For example, in a sample of Mexican American young women, Sánchez et al. (2010) found that acculturation predicted the use of less positive coping and more negative coping styles (e.g., avoidant coping), which in turn predicted greater substance use and other risk behavior. Hence, as Mexican American youth acculturate, they may begin to adopt more favorable views towards alcohol use and therefore might be more likely to use maladaptive coping strategies (e.g., drugs/alcohol) when emotionally distressed. Such findings are consistent with general acculturation theory (Berry, 1997), which holds that greater orientation toward mainstream U.S. values is associated with changing attitudes, traditions, and practices that favor more frequent alcohol use.

Contrary to expectations, the general distress factor did not predict past three month binge drinking in either the boys or girls models, over and above covariates.

Likewise, acculturation was not found to moderate this effect. Our inability to detect a similar 2-way interaction as in past month alcohol use with respect to acculturation may likely have been due to the fact that the present samples were underpowered. Indeed, while past month alcohol use was fairly common in the present sample (e.g., 26.1% for girls), past three month binge drinking was much less prevalent (e.g., 13.4% for girls). Therefore, it may be that differences in the association between the general distress factor and binge drinking existed by acculturation status but were not detectable in our analysis due to limitations on power that were imposed by the complexity of our model, sample size, and limited distribution of the binge drinking outcome measure.

Interestingly, the present study also found no significant interaction effects between the general distress factor and enculturation on alcohol use in either the boys or girls models. To our knowledge, only one other study to date has tested the moderating role of acculturation and enculturation in the association between internalizing symptoms and alcohol use among Latino youth. Using the same sample but different time-points as the current study, Gonzales et al. (2017) found that parent-reported internalizing symptoms positively predicted alcohol and substance use symptom counts for adolescents who endorsed low levels of acculturation, but not at higher levels of acculturation. In addition, consistent with findings from the current study, that study found no significant moderation effects by enculturation. Gonzales' finding that internalizing symptoms interacted with low levels of acculturation to predict greater risk for problematic alcohol use is intriguing, given our results which showed that low levels of acculturation were inversely related to past month alcohol use. These differences may be due to

methodological factors. For example, the current study disaggregated the role of common and unique elements of internalizing distress, whereas Gonzales' study utilized a composite variable that encompassed multiple forms of internalizing symptoms. Given that prior empirical work has found differential relations between different dimensions of internalizing symptoms and alcohol use, it is unsurprising that our results differed (Hussong et al., 2017). Nonetheless, our results are in accordance with those of Gonzales et al. (2017) in suggesting that acculturation may be a particularly influential process that may exert effects on the strength of the association between internalizing distress and alcohol use among Mexican American youth.

Although relatively little attention has focused on the potential buffering effects of enculturation on substance use behavior among Latino youth, current findings are at odds with previous work demonstrating that enculturation is protective (Berkel et al., 2010; Germán, Gonzales, Dumka, 2009; Gonzales et al., 2008). Indeed, a host of studies have found that identification with traditional Latino values promotes resilience against adolescent substance use (German, Gonzales, & Dumka, 2009; Gonzales et al., 2008; Schwartz, Zamboanga, & Jarvis, 2007; Unger et al., 2009). However, these findings have not been entirely consistent, with some studies concluding that endorsement of traditional Latino values bears little relevance to adolescent substance use (Ramirez et al., 2004).

Effect of Specific Factors of Internalizing Distress on Alcohol Use

Our findings on the associations between the specific factors of internalizing distress and alcohol use are also consistent with previous literature demonstrating differential relations between internalizing symptoms and alcohol use (Hussong et al.,

2017; Kaplow et al., 2001; Nichter & Chassin, 2015). Among girls, depressed mood was found to be positively related to past month alcohol use. However, this effect was dependent on level of prior alcohol use problems. Specifically, we found that depressed mood was positively related to alcohol use, but only when prior alcohol use problems were low. This result is in accordance with prior investigations which find that depressive symptoms are more strongly related to alcohol use in girls than boys (Chassin et al., 1999; Mason et al., 2007). For example, Chassin et al. (1999) found that girls with internalizing problems (a composite of depression and anxiety symptoms) were significantly more at risk for the development of an alcohol use disorder. Nolen-Hoeksema & Harrell (2002) hypothesized that women may be more at risk for using alcohol when depressed due to greater levels of depressive rumination, perhaps in an attempt to “escape the self”. However, it is also worth noting that the endorsement rates of depressed mood were considerably lower among boys relative to girls (as would be expected), and therefore there may have been insufficient statistical power to detect meaningful effects in the boys model.

There are several reasons why the association between depressed mood and alcohol use may be dependent on level of prior alcohol use problems. First, it is plausible that girls with high amounts of prior alcohol use problems may be prone to drinking for other reasons (e.g., externalizing characteristics) and less out of a need to manage their mood. Perhaps for this subgroup of girls depressed mood plays a more limited role in accounting for drinking behavior. Second, depressed girls may be less discriminating to use alcohol as a coping strategy if they had not previously experienced adverse

consequences as a result of their drinking behavior. For example, if girls had previously experienced alcohol related problems (e.g., DUI, sexual assault), they may recognize that drinking when they are feeling depressed can lead to serious negative consequences. On the other hand, if girls had not experienced negative consequences from alcohol consumption in the past, they may be more willing to use alcohol as a coping strategy when feeling distraught.

Socially anxious youth find unstructured peer encounters highly distressing and are more likely to be socially withdrawn (Beidel & Morris, 1995; Inderbitzen, Walters, & Bukowski, 1997). As such, one might expect to see a negative association between social anxiety and binge drinking as we did in our study among boys. Indeed, socially anxious adolescents may engage in less risky alcohol use because they are less likely to be immersed in peer contexts where binge drinking typically occurs (Pardee, Colder, & Bowker, 2014). Moreover, social withdrawal is especially common among boys with social anxiety (Dell'Osso et al., 2015). Current results match those observed in earlier studies which suggest that social anxiety may serve as a protective factor against alcohol use during adolescence (Frojd et al., 2011).

Contrary to expectations, the current study did not find any significant associations between general worry and alcohol use. This result may be explained by emerging evidence which suggests that cognitive symptoms of anxiety are less relevant to the etiology of adolescent alcohol use relative to physiological symptoms (Nichter & Chassin, 2015; Pardee, Colder, & Bowker, 2014; Parrish et al., 2016). For example, Parrish et al. (2016) found that anxious arousal symptoms of anxiety, but not cognitive

symptoms, were associated with alcohol use among Mexican American adolescents. Similarly, Nichter and Chassin (2015) found that physiological anxiety conferred risk for adolescent binge drinking and alcohol dependence symptoms, whereas worry symptoms were negatively associated with these outcomes. Alternatively, it is also possible that what is unique to general worry may not play a role in the etiology of alcohol use after what is common to other forms of internalizing distress is removed (Pardee, Colder, & Bowker, 2014).

Interestingly, in tests of moderation, we found no significant effects for either dimension of cultural orientation in the association between any of the specific factors of internalizing distress and alcohol use. One possible explanation for this result was that the general internalizing factor accounted for a significant proportion of the variance and the specific factors had limited variability to contribute for prediction of interaction effects. As illustrated in Figure 3, the bifactor modeling approach we used tested whether there were unique contributions of the specific factors to the alcohol outcome variables, after controlling for common variance by the general factor (Chen et al., 2012). Given that the specific factors reflected the unique variance of each construct after co-varying out variance attributable to other factors, it is possible the model was underpowered to detect interaction effects and results should be interpreted with caution.

Strengths and Limitations

This study's findings should be considered in light of several methodological limitations. First, the latent constructs for internalizing distress were operationalized in the current study using items from the C-DISC, which is a structured diagnostic interview

measure designed to diagnose DSM-IV disorders. Although the internal consistency of the C-DISC modules were within the acceptable range, it is nonetheless possible that a significant amount of measurement error was present in the current analyses. Future studies investigating the role of common and specific components of internalizing distress might yield more accurate results if more comprehensive measures of depression and anxiety were used. For instance, the Center for Epidemiologic Studies Depression Scale includes several subscales such as somatic symptoms, negative affect, and anhedonia. Similarly, a more inclusive measure of anxiety that encompasses broad symptom domains (e.g., social anxiety, physiological symptoms, worry) may be beneficial.

Second, the sample size of the present study may have limited the statistical power for testing interactions. Although several interactions were found, current findings may underestimate the extent to which the associations between the common and specific components of internalizing distress and alcohol use vary as a function of acculturation and enculturation. Future studies are needed that examine these complex associations with larger samples. Third, the current study exclusively used youth's self-report of internalizing distress symptoms and alcohol use, and this introduces possibility of common method variance. Although prior psychometric studies have supported the use of self-report measures for assessing both internalizing symptoms (Merrell et al., 2002) and substance use (Winters et al., 1990) among adolescents, there nonetheless is the possibility that participants may have selectively suppressed information due to concern about the ramifications of their behavior (Thornberry & Krohn, 2000). Fourth, the *La*

Familia study sampling methodology prioritized recruiting families that were intact (e.g., mother and father present), which may have led to decreased rates of overall internalizing distress and substance use in the present sample (Sandler, Tein, & West, 1994; Wolchik et al., 2013).

Despite these limitations, the current study had numerous strengths. First, in addition to a longitudinal study design, we utilized advanced analytic methods which allowed for the examination of the role of general versus specific components of internalizing distress on alcohol use among a sample of Mexican American adolescents. To date, most studies have focused on the association between specific internalizing disorders and alcohol use (Woodward & Fergusson, 2001; Zimmerman et al., 2003). However, these studies have ignored the fact that internalizing symptoms are often highly correlated and therefore may share common underlying components. Utilization of the bifactor model in the present study allowed us to disaggregate the common versus specific components of internalizing distress symptoms and investigate their respective associations with alcohol use outcomes.

Second, whereas a significant proportion of studies of Mexican-origin families have focused on lower-income, English-speaking participants, our study was unique in its strong representative sampling plan. This sampling strategy resulted in linguistic and socioeconomic diversity, in addition to the inclusion of adequate numbers of Mexican American and Mexican immigrant adolescents. Third, rather than using a global proxy measure for acculturation and enculturation (e.g., language use or generation status) as the majority of studies have done in the past, this study used two values based scales to

measure these constructs. These scales were based on a combination of 12 subscales supported by theory and prior empirical research (Knight et al., 2010). Fourth, the present analyses examined the possible moderating roles of acculturation and enculturation in the association between internalizing distress and alcohol use, given prior scholars' recommendations to examine the role of *both* of these cultural processes (Gonzales et al., 2012).

Summary and Conclusion

The overall purpose of this study was to use an innovative approach of bifactor modeling to obtain greater clarity about the hierarchical nature of internalizing distress and its relation to adolescent alcohol use. To our knowledge, there has only been one other empirical study which has attempted to disaggregate the roles of internalizing symptoms and examine how each facet may portend risk for alcohol use among Mexican origin youth (Parrish et al., 2016). The importance of this topic cannot be overstated, given that although Mexican American adolescents represent a high-risk group for internalizing symptomatology and alcohol use, very little research has explored the relations between these variables.

The present study makes important contributions to understanding how different facets of internalizing distress contribute to alcohol use among Mexican American adolescents. Overall, results demonstrated that multiple forms of internalizing distress share a common underlying distress component. It is possible this higher-order factor represents a risk factor for experiencing multiple forms of unspecified psychological distress. Moreover, the bifactor model identified three specific factors—depressed mood,

general worry, and social anxiety. The specific factors were conceptualized as reflecting variance that was unique to each form of distress, after co-varying out variance attributable to the other factors. Our results are consistent with previous studies and support the view that a broad distress factor underlies multiple forms of internalizing symptoms (Brodeck et al., 2014; Ebesutani et al., 2011; Lahey et al., 2016; Krueger & Eaton, 2015; Kushner et al., 2012; Simms et al., 2008; Thomas et al., 2012). The strong statistical and conceptual support for the bifactor model in our study would suggest that researchers consider hierarchical models as possible alternatives to models with correlated factors without a general factor in order to gain a more comprehensive understanding about the association between internalizing symptoms and substance use.

Findings revealed that the general distress factor was a significant predictor of past month alcohol use in both the boys and girls models. However, these effects were conditional based on level of acculturation. At low levels of acculturation, general internalizing distress was found to be negatively related to past month alcohol use. Conversely, at high levels of acculturation, there was a trend in the data for general internalizing distress to be positively related to past month alcohol use, although this effect was not significant. Current findings suggest that a common distress component shared by multiple forms of internalizing distress may have complex, opposing relations with alcohol use among Mexican-American youth, depending on youth's level of acculturation. These results underscore the importance of considering the roles of both acculturation and enculturation when investigating the association between internalizing symptomatology and substance use among Hispanic youth.

The current study also elucidates the ways in which unique facets of internalizing distress differentially relate to adolescent alcohol use. After accounting for the common variance shared between depressed mood, general worry, and social anxiety symptoms, we found significant associations between several of the domain-specific forms of internalizing distress and alcohol use. Results demonstrated that depressed mood was positively associated with past month alcohol use for girls. However, this effect was conditional on level of prior alcohol use problems. This finding is in agreement with the results of a recent review by Hussong and colleagues (2017), who concluded that depressive symptoms were the most consistently robust form of internalizing symptom associated with adolescent alcohol use.

Lastly, findings revealed that social anxiety was negatively associated with binge drinking among boys. These results match those observed in earlier studies, suggesting that social anxiety may be a protective factor against risky alcohol use during adolescence (Frojd et al., 2011). Taken together, our findings suggest that both common and unique elements of internalizing distress may be relevant predictors of Mexican-American adolescents' likelihood for using alcohol. Moreover, results are in line with previous investigations which find that different forms of internalizing symptoms confer differential risk for alcohol use among Mexican-American youth (Parrish et al., 2016).

Our findings have several significant implications for future research. First, it is crucial that future studies disaggregate internalizing symptoms to more fully understand their etiologic contributions towards adolescent substance use. Second, further research is needed which evaluates the extent to which adolescent alcohol use and misuse is related

to common versus specific components of internalizing disorders. Findings from the present study suggest that both a common distress factor and domain-specific features of internalizing distress may be relevant to the etiology of alcohol use among Mexican American adolescents. Future research should seek to replicate these findings in a broader sample—specifically, a sample that is not composed exclusively of Mexican American youth. Third, more research is needed which investigates how internalizing symptoms, youth cultural orientation, and gender may interact to predict substance use and other risk behavior among Mexican American youth. Indeed, a more nuanced understanding of the specific antecedents that contribute to risk among Mexican American populations may facilitate the development of more culturally sensitive interventions to curb substance use in this population (Castro, Barrera, & Steiker, 2010). Lastly, further studies are needed which examine the underlying mechanisms that account for the association between internalizing symptoms and adolescent substance use. To date, there continues to be significant speculation but few actual empirical studies that have examined the processes through which internalizing symptoms contribute to substance use among youth.

Table 1. *Descriptive Statistics of Study Variables for Girls*

Categorical variables	Frequency				
Living situation ^b	77.2% Living with family				
	22.8% Living outside the home				
Adolescent nativity ^a	73.2% United States				
	26.8% Mexico				
<u>Internalizing Items:</u>	<u>Endorsement</u>				
DEPRESSED MOOD 1	11.5%				
DEPRESSED MOOD 2	4.7%				
GENERAL WORRY 1	15.3%				
GENERAL WORRY 2	8.4%				
GENERAL WORRY 3	11.5%				
GENERAL WORRY 4	34.3%				
GENERAL WORRY 5	7.8%				
SOCIAL ANXIETY 1	12.5%				
SOCIAL ANXIETY 2	10.6%				
SOCIAL ANXIETY 3	18.1%				
SOCIAL ANXIETY 4	14.0%				
SOCIAL ANXIETY 5	15.9%				
Continuous and Count Variables	Mean (<i>SD</i>)	Min.	Max	Skewness	Kurtosis
Economic hardship ^a	2.82 (1.08)	1	5	.034	-.834
Conduct problems ^a	1.26 (1.61)	0	9.5	1.94	4.79
W1 Alcohol use problems ^a	.16 (.98)	0	13	9.81	113.66
W2 Past month alcohol use ^b	.65 (1.73)	0	20	6.41	61.94
W2 Binge drinking ^b	.36 (.83)	0	4	2.74	7.51
Acculturation ^a	2.80 (.53)	1.5	4.5	.248	-.012
Enculturation ^a	3.89 (.45)	2.1	4.9	-.640	.625

^a *n*=321

^b *n*=265

Table 2. Descriptive Statistics of Study Variables for Boys

Categorical variables	Frequency					
Living situation ^a	89% Living with family 11% Living outside the home					
Adolescent nativity ^a	68.3% United States 31.7% Mexico					
<u>Internalizing:</u>	<u>Endorsement</u>					
DEPRESSED MOOD 1	5.2%					
DEPRESSED MOOD 2	2.6%					
GENERAL WORRY 1	18.6%					
GENERAL WORRY 2	13.7%					
GENERAL WORRY 3	8.2%					
GENERAL WORRY 4	30.1%					
GENERAL WORRY 5	6.2%					
SOCIAL ANXIETY 1	15.4%					
SOCIAL ANXIETY 2	7.5%					
SOCIAL ANXIETY 3	17.3%					
SOCIAL ANXIETY 4	14.1%					
SOCIAL ANXIETY 5	14.7%					
SOCIAL ANXIETY 6	16.0%					
Continuous and Count Variables	Mean (SD)	Min.	Max	Skewness	Kurtosis	
Economic hardship ^a	2.77 (1.10)	0	0	.043	-.731	
Conduct problems ^a	1.99 (2.45)	0	13	2.04	4.65	
W1 Alcohol use problems ^a	.53 (2.01)	0	20	5.74	40.9	
W2 Past month alcohol use ^b	.82 (1.71)	0	10	2.79	8.38	
W2 Binge drinking ^b	.85 (1.42)	0	5	1.67	1.74	
Acculturation ^a	3.0 (.56)	2	5	.238	.068	
Enculturation ^a	3.96 (.46)	3	5	-.409	-.219	

^a n=305

^b n=215

Table 3. *Correlations among all study variables among girls*

	1	2	3	4	5	6	7	8	9	10	11	12
1. Depressed mood	--											
2. General worry	.143*	--										
3. Social anxiety	.124*	.184**	--									
4. Conduct problems	.112*	.003	.111*	--								
5. Living situation	.050	-.083	.023	-.031	--							
6. Prior alcohol problems	.072	-.026	.014	.238**	.091	--						
7. Acculturation	-.051	.062	-.003	.022	-.012	-.009	--					
8. Enculturation	-.072	.048	.042	-.013	-.020	-.098	.137*	--				
9. Nativity	-.153	.038	.056	.004	-.006	-.018	.126*	.008	--			
10. Economic hardship	.047	.057	.046	.113*	-.057	-.034	-.027	-.011	.217**	--		
11. Past month alcohol use	.006	.061	-.010	.111	-.045	.139*	.064	-.066	-.108	.035	--	
12. Past three month binge	.046	.005	-.100	.246**	-.015	.369**	.200*	-.156	-.088	.001	.796**	--

Note. * $p < .05$, ** $p < .01$. Comparisons between two dichotomous variables estimated using phi coefficients. Nativity=0 for US, 1 for Mexico. Living situation= 0 for living with family, 1 for living outside the family home. Composite scores were created for each form of internalizing symptom based on the means of the items; however, composite scores were not used in the SEM model. Given that correlations are not relevant for count outcomes, alcohol use outcomes were dichotomized to give a better sense of their zero-order relations.

Table 4. Correlations among all study variables among boys

	1	2	3	4	5	6	7	8	9	10	11	12
1. Depressed mood	--											
2. General worry	.279**	--										
3. Social anxiety	.073	.171**	--									
4. Conduct problems	.240**	.078	.046	--								
5. Living situation	.091	.138*	.012	-.050	--							
6. Prior alcohol problems	.308**	.107	.107	.517**	-.083	--						
7. Acculturation	.083	.002	.058	.120*	-.119	.075	--					
8. Enculturation	-.185**	-.001	.056	.022	.146*	.055	.235**	--				
9. Nativity	-.060	-.058	-.060	-.017	-.094	-.078	.021	.014	--			
10. Economic hardship	.088	.060	.009	.067	-.057	.028	.114*	.105	.294**	--		
11. Past month alcohol use	.077	.100	.003	.130	.123	.148*	-.042	.129	.123	-.090	--	
12. Past three month binge	.094	.095	.183	.277**	.071	.209*	.068	.079	.154	-.062	.901**	--

Note. * $p < .05$, ** $p < .01$. Comparisons between two dichotomous variables estimated using phi coefficients. Nativity=0 for US, 1 for Mexico. Living situation= 0 for living with family, 1 for living outside the family home. Composite scores were created for each form of internalizing symptom based on the means of the items; however, composite scores were not used in the SEM model. Given that correlations are not relevant for count outcomes, alcohol use outcomes were dichotomized to give a better sense of their zero-order relations.

Table 5. Attrition analyses comparing female adolescents retained in the sub-sample at Wave 4 with those that did not complete the Wave 4 data collection on Wave 1 study variables

	Variable	Sample retained at W4 (n = 321)	Sample dropped at W4 (n = 45)	Difference Test
1.	T1 Child nativity (% born in US)	68.2%	73.2%	$\chi^2(1) = .509, p = .475$
2.	T1 Economic hardship	$X = 2.27$ (SD = .95)	$X = 2.82$ (SD = 1.07)	$F(1) = .804, p = .371$
3.	T1 Conduct problems	$X = 2.0$ (SD = 2.82)	$X = 1.26$ (SD = 1.61)	$F(1) = .413, p = .521$
4.	T1 Prior alcohol use problems	$X = .16$ (SD = .98)	$X = .15$ (SD = .95)	$F(1) = .064, p = .315$
5.	T1 Acculturation	$X = 2.89$ (SD = .63)	$X = 2.80$ (SD = .53)	$F(1) = .569, p = .451$
6.	T1 Enculturation	$X = 4.37$ (SD = .35)	$X = 4.27$ (SD = .27)	$F(1) = 3.04, p = .082$

Note: Attrition analyses were conducted using chi-square tests for categorical variables and ANOVAs for continuous variables.

Table 6. Attrition analyses comparing male adolescents retained in the sub-sample at Wave 4 with those that did not complete the Wave 4 data collection on Wave 1 study variables

	Variable	Sample retained at W4 (n = 305)	Sample dropped at W4 (n = 78)	Difference Test
1.	T1 Child nativity (% born in US)	64.9%	68.6%	$\chi^2 (1) = .535, p = .612$
2.	T1 Economic hardship	$X = 2.43 (SD = .78)$	$X = 2.77 (SD = 1.01)$	$F(1) = .592, p = .484$
3.	T1 Conduct problems	$X = 2.33 (SD = 4.04)$	$X = 1.99 (SD = 2.45)$	$F(1) = .054, p = .816$
4.	T1 Prior alcohol use problems	$X = .60 (SD = 2.11)$	$X = .58 (SD = 2.09)$	$F(1) = .035, p = .432$
5.	T1 Acculturation	$X = 2.97 (SD = .79)$	$X = 3.93 (SD = .70)$	$F(1) = .120, p = .631$
6.	T1 Enculturation	$X = 4.31 (SD = .33)$	$X = 4.32 (SD = .31)$	$F(1) = .009, p = .781$

Note: Attrition analyses were conducted using chi-square tests for categorical variables and ANOVAs for continuous variables.

Table 7. Attrition analyses comparing female adolescents retained in the subsample at Wave 5 with those that did not complete the Wave 5 data collection on Wave 1 and Wave 4 study variables

	Variable	Wave 1 Study Variables			Wave 4 Study Variables		
		Retained at W5 (n = 265)	Dropped at W5 (n = 101)	Difference Test	Retained at W5 (n = 265)	Dropped at W5 (n = 56)	Difference Test
1.	T1 Child nativity (% born in US)	70.7.6%	78.0%	$\chi^2(1) = 1.96, p = .189$	64.9%	83.9%	$\chi^2(1) = 3.76, p = .038$
2.	T1 Economic hardship	$X = 2.82$ (SD = 1.07)	$X = 2.81$ (SD = 1.09)	$F(1) = .002, p = .961$	$X = 2.83$ (SD = 1.07)	$X = 2.82$ (SD = 1.09)	$F(1) = .004, p = .948$
3.	T1 Conduct problems	$X = 1.28$ (SD = 1.63)	$X = 1.20$ (SD = 1.58)	$F(1) = 1.19, p = .731$	$X = 1.27$ (SD = 4.04)	$X = 1.20$ (SD = 1.58)	$F(1) = .270, p = .748$
4.	T1 Prior alcohol use problems	$X = .17$ (SD = 1.06)	$X = .08$ (SD = .46)	$F(1) = .372, p = .542$	$X = .58$ (SD = 2.11)	$X = .47$ (SD = 2.03)	$F(1) = .372, p = .542$
5.	T1 Acculturation	$X = 2.92$ (SD = .76)	$X = 2.78$ (SD = .71)	$F(1) = 2.39, p = .123$	$X = 2.77$ (SD = .79)	$X = 2.92$ (SD = .81)	$F(1) = 1.806, p = .180$
6.	T1 Enculturation	$X = 4.38$ (SD = .33)	$X = 4.30$ (SD = .41)	$F(1) = 3.450, p = .064$	$X = 4.38$ (SD = .34)	$X = 4.35$ (SD = .41)	$F(1) = .327, p = .568$

Note: Attrition analyses were conducted using chi-square tests for categorical variables and ANOVAs for continuous variables.

Table 8. Attrition analyses comparing male adolescents retained in the subsample at Wave 5 with those that did not complete the Wave 5 data collection on Wave 1 and Wave 4 study variables

	Variable	Wave 1 Study Variables			Wave 4 Study Variables		
		Retained at W5 (n = 215)	Dropped at W5 (n = 168)	Difference Test	Retained at W5 (n = 215)	Dropped at W5 (n = 90)	Difference Test
1.	T1 Child nativity (% born in US)	71.0%	64.9%	$\chi^2(1) = 2.19, p = .153$	68.6%	63.9%	$\chi^2(1) = 1.46, p = .236$
2.	T1 Economic hardship	$X = 2.68$ (SD = 1.08)	$X = 2.92$ (SD = 1.11)	$F(1) = 3.153, p = .077$	$X = 2.69$ (SD = 1.07)	$X = 2.93$ (SD = 1.13)	$F(1) = 3.669, p = .082$
3.	T1 Conduct problems	$X = 1.89$ (SD = 2.29)	$X = 2.23$ (SD = 2.77)	$F(1) = 1.25, p = .263$	$X = 1.99$ (SD = 2.45)	$X = 1.86$ (SD = 2.66)	$F(1) = 1.07, p = .301$
4.	T1 Prior alcohol use problems	$X = .49$ (SD = 1.79)	$X = .77$ (SD = 2.64)	$F(1) = 1.07, p = .301$	$X = .58$ (SD = 2.09)	$X = .64$ (SD = 2.22)	$F(1) = 1.216, p = .271$
5.	T1 Acculturation	$X = 2.89$ (SD = .69)	$X = 2.99$ (SD = .74)	$F(1) = 1.86, p = .173$	$X = 2.89$ (SD = .69)	$X = 3.01$ (SD = .71)	$F(1) = 1.81, p = .179$
6.	T1 Enculturation	$X = 4.29$ (SD = .33)	$X = 4.33$ (SD = .32)	$F(1) = 1.45, p = .229$	$X = 4.29$ (SD = .33)	$X = 4.35$ (SD = .37)	$F(1) = 1.909, p = .168$

Note: Attrition analyses were conducted using chi-square tests for categorical variables and ANOVAs for continuous variables.

Table 9. *Model Fit Statistics for Competing Factor Models for Boys and Girls (Combined)*

Model	Indicators of Model Fit						
	χ^2			CFI	TFI	RMSEA	WRMSR
	Value	df	p value				
Three Factor Multidimensional CFA	162.87	113	.0015	.99	.98	.03	0.93
Higher-Order Factor Model	162.85	120	0.005	.99	.98	.02	0.99
Three Factor Bifactor	159.15	105	.0005	.99	.98	.03	0.90

Table 10. *Model Fit Statistics for Competing Factor Models for Girls*

Model	Indicators of Model Fit						
	χ^2			CFI	TFI	RMSEA	WRMSR
	Value	df	p value				
Three Factor Multidimensional CFA	Convergence error						
Higher-Order Factor Model	61.73	65	.59	1.0	1.0	.00	.70
Three Factor Bifactor	49.93	53	.59	1.00	1.0	.00	.56

Table 11. *Model Fit Statistics for Competing Factor Models for Boys*

Model	Indicators of Model Fit						
	χ^2			CFI	TFI	RMSEA	WRMSR
	Value	df	p value				
Three Factor Multidimensional CFA	Convergence error						
Higher-Order Factor Model	114.00	77	.00	.98	.98	.04	1.01
Three Factor Bifactor	54.32	53	.42	.99	.99	.00	.62

Table 12. *Standardized factor loadings and R² for measurement model for girls model*

Item number	General	Depressed mood	General Worry	Social anxiety	R ²	% Endorsement
DEPRESSED MOOD 1	.366	.721			.653	11.5%
DEPRESSED MOOD 2	.569	.721			.843	4.7%
GENERAL WORRY 1	.427		.539		.473	15.3%
GENERAL WORRY 2	.188		.557		.346	8.4%
GENERAL WORRY 3	.490		.484		.475	11.5%
GENERAL WORRY 4	.308		.377		.237	34.3%
GENERAL WORRY 5	.482		.658		.665	7.8%
SOCIAL ANXIETY 1	.454			.473	.402	12.5%
SOCIAL ANXIETY 2	.512			.700	.752	10.6%
SOCIAL ANXIETY 3	.436			.837	.890	18.1%
SOCIAL ANXIETY 4	.570			.670	.774	14.0%
SOCIAL ANXIETY 5	.556			.755	.880	15.9%
SOCIAL ANXIETY 6	.354			.833	.819	19%

Note. All factor loading are significant at $p < .05$. Factor loadings for depressed mood were constrained to be equal given that model estimation problems occurred if parameters were freed due to the small number of indicators.

Table 13. *Standardized factor loadings and R² for measurement model for boys model*

Item number	General	Depressed mood	General Worry	Social anxiety	R ²	% Endorsement
DEPRESSED MOOD 1	.660	.618			.818	5.2%
DEPRESSED MOOD 2	.308	.618			.477	2.6%
GENERAL WORRY 1	.647		.304		.510	18.6%
GENERAL WORRY 2	.646		.274		.492	13.7%
GENERAL WORRY 3	.632		.451		.602	8.2%
GENERAL WORRY 4	.331		.556		.419	30.1%
GENERAL WORRY 5	.871		.523		.769	6.2%
SOCIAL ANXIETY 1	.366			.563	.450	15.4%
SOCIAL ANXIETY 2	.239			.915	.895	7.5%
SOCIAL ANXIETY 3	.376			.863	.886	17.3%
SOCIAL ANXIETY 4	.135			.884	.799	14.1%
SOCIAL ANXIETY 5	.227			.949	.952	14.7%
SOCIAL ANXIETY 6	.462			.790	.837	16.0%

Note. All factor loading are significant at $p < .05$. Factor loadings for depressed mood were constrained to be equal given that model estimation problems occurred if parameters were freed due to the small number of indicators.

Table 14. Comparison of Fit Statistics for Poisson, Negative Binomial, and ZIP Models Predicting Alcohol Use for Girls

<i>Past Month Use</i>	Parameters	Loglikelihood	AIC	BIC
Poisson	19	-2627.529	5347.058	5520.544
Negative binomial	20	-2532.256	5158.511	5335.769
ZIP	20	-2583.266	5204.531	5276.188
<i>Binge Drinking</i>	Parameters	Loglikelihood	AIC	BIC
Poisson	19	-2381.518	4855.035	5028.522
Negative binomial	20	-2379.94	4853.898	5031.156
ZIP	20	-2553.628	5143.257	5211.143

Note. ZIP= Zero-Inflated Poisson. AIC= Akaike Information Criterion. BIC= Bayesian Information Criterion.

Table 15. Comparison of Fit Statistics for Poisson, Negative Binomial, and ZIP Models Predicting Alcohol Use for Boys

<i>Past Month Use</i>	Parameters	Loglikelihood	AIC	BIC
Poisson	46	-2738.785	5569.570	5740.855
Negative binomial	47	-2666.858	5427.715	5602.724
ZIP	47	-2673.626	5441.252	5616.261
<i>Binge Drinking</i>	Parameters	Loglikelihood	AIC	BIC
Poisson	19	-2595.513	5283.026	5454.311
NB	20	-2576.922	5247.843	5422.852
ZIP	20	-2579.991	5254.982	5432.990

Note. ZIP= Zero-Inflated Poisson. AIC= Akaike Information Criterion. BIC= Bayesian Information Criterion.

Table 16. *Summary of Girls General and Specific Factors Predicting Past Month Alcohol Use*

Predictor	Past Month Alcohol Use		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.351	.39	.70
INT depressed mood	.779†	.45	2.17
INT worry	.520	.32	1.68
INT social anxiety	.450	.36	1.56
Conduct problems	.085	.09	1.08
Living situation	.323	.39	1.38
Economic hardship	.023	.13	1.02
Prior alcohol problems	.312**	.10	1.36
Nativity	-.805*	.35	.44
Enculturation	-.330	.30	.71
Acculturation	.023	.13	1.02
INT Dep x Prior alc problems	-.680*	.33	.50

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n=321$. *B*= Unstandardized regression coefficient. *SE*= Standard error. Negative binomial regression was used for 30 day alcohol use. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation= 0 for living with family, 1 for living outside the family home.

Table 17. Summary of Girls General and Specific Factors Predicting Past Month Alcohol Use, Moderation by Acculturation

Predictor	Past Month Alcohol Use		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.455	.45	.63
INT depressed mood	.720	.45	2.05
INT worry	.537	.32	1.71
INT social anxiety	.482	.35	1.61
Conduct problems	.110	.10	1.11
Living situation	.422	.13	1.52
Economic hardship	.032	.19	1.03
Prior alcohol problems	.342*	.13	1.40
Nativity	-.852*	.35	.42
Enculturation	-.416	.31	.65
Acculturation	.407	.26	1.50
INT Dep x Prior alc problems	-.728*	.36	.48
INT General x Acculturation	1.39*	.56	4.01

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 321$. *B* = Unstandardized regression coefficient. *SE* = Standard error. Negative binomial regression was used for 30 day alcohol use. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 18. *Summary of Girls General and Specific Factors Predicting Past Month Alcohol Use, Moderation by Enculturation*

Predictor	Past Month Alcohol Use		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.437†	.36	.64
INT depressed mood	.772*	.45	2.16
INT worry	.744	.35	2.16
INT social anxiety	.477	.36	1.61
Conduct problems	.118	.10	1.12
Living situation	.686†	.41	1.98
Economic hardship	-.024	.14	.97
Prior alcohol problems	.330**	.10	1.39
Nativity	-.894*	.37	.40
Enculturation	-.346	.30	.70
Acculturation	.465	.33	1.59
INT Dep x Prior alc problems	-.559	.15	.57
INT General x Enculturation	.410	.44	1.50

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 321$. *B* = Unstandardized regression coefficient. *SE* = Standard error. Negative binomial regression was used for 30 day alcohol use. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 19. *Summary of Girls General and Specific Factors Predicting Binge Drinking*

Predictor	Binge Drinking		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.173	.595	.84
INT depressed mood	.527	.527	1.69
INT worry	-.383	.518	.68
INT social anxiety	-.272	.609	.76
Conduct problems	.236*	.112	1.26
Living situation	.371†	.214	1.44
Economic hardship	.142	.348	1.15
Prior alcohol problems	.277**	.098	1.31
Nativity	-.686	.431	.50
Enculturation	-.600*	.288	.54
Acculturation	.859**	.325	2.36

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 321$. *B* = Unstandardized regression coefficient. *SE* = Standard error. A standard Poisson regression was used for past three month binge drinking. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 20. *Summary of Girls General and Specific Factors Predicting Binge Drinking, Moderation by Acculturation*

Predictor	Binge Drinking		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.295	.61	.74
INT depressed mood	.531	.53	1.70
INT worry	-.616	.54	.54
INT social anxiety	-.313	.59	.73
Conduct problems	.254*	.11	1.28
Living situation	.497*	.23	1.64
Economic hardship	.192	.15	1.21
Prior alcohol problems	.258**	.09	1.29
Nativity	-.889*	.48	.41
Enculturation	-.590*	.15	.55
Acculturation	1.19**	.15	3.28
INT General x Acculturation	1.56	.861	4.75

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 321$. *B* = Unstandardized regression coefficient. *SE* = Standard error. A standard Poisson regression was used for past three month binge drinking. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 21. *Summary of Girls General and Specific Factors Predicting Binge Drinking, Moderation by Enculturation*

Predictor	Binge Drinking		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
NA general	-.110	.59	.89
NA depressed mood	.596	.50	1.81
NA worry	-.408	.50	.66
NA social anxiety	-.228	.59	.79
Conduct problems	.230*	.10	1.25
Living situation	.266	.22	1.30
Economic hardship	.101	.15	1.10
Prior alcohol problems	.297**	.10	1.34
Nativity	-.655	.43	.51
Enculturation	-.474	.30	.62
Acculturation	.875**	.33	2.39
INT General x Enculturation	.742	.470	2.10

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 321$. *B* = Unstandardized regression coefficient. *SE* = Standard error. A standard Poisson regression was used for past three month binge drinking. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 22. Summary of Boys General and Specific Factors Predicting Alcohol Use

Predictor	Past Month Alcohol Use			Past 3 Month Binge Drinking		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.264	.24	.76	-.292	.37	.74
INT depressed mood	-.259	.42	.77	-.497	.31	.60
INT worry	-.026	.31	.97	-.300	.22	.74
INT social anxiety	.013	.24	1.01	-.390†	.22	.67
Conduct problems	.149*	.07	1.16	.200*	.08	1.22
Living situation	.366	.38	1.44	.906	.56	2.47
Economic hardship	.139	.28	1.14	-.063	.13	.93
Prior alcohol problems	.145*	.07	1.15	.108*	.05	1.11
Nativity	.545	.34	1.72	.782*	.33	2.18
Enculturation	-.450	.31	.63	-.245	.37	.78
Acculturation	-.040	.24	.96	.267	.27	1.30

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 305$. *B* = Unstandardized regression coefficient. *SE* = Standard error. A negative binomial regression was used for past month alcohol use and past three month binge drinking. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 23. Summary of Boys General and Specific Factors Predicting Alcohol Use, Moderation by Acculturation

Predictor	Past Month Alcohol Use			Past 3 Month Binge Drinking		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.256	.24	.77	-.257	.24	.77
INT depressed mood	-.443	.41	.64	-.667	.37	.51
INT worry	.117	.029	1.12	-.205	.30	.81
INT social anxiety	.029	.23	1.02	-.395†	.22	.67
Conduct problems	.164*	.07	1.17	.211*	.08	1.23
Living situation	.460	.38	1.58	.921†	.55	2.51
Economic hardship	.166	.21	1.80	-.043	.14	.95
Prior alcohol problems	.109	.186	1.11	.083	.06	1.08
Nativity	.475	.34	1.60	.755*	.33	2.12
Enculturation	-.420	.31	.65	-.192	.37	.82
Acculturation	-.121	.23	.88	.178	.28	1.19
INT General x Accult	.966*	.48	2.62	.680	.51	2.09

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 305$. *B* = Unstandardized regression coefficient. *SE* = Standard error. A negative binomial regression was used for past month alcohol use and past three month binge drinking. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Table 24. Summary of Boys General and Specific Factors Predicting Alcohol Use, Moderation by Enculturation

Predictor	Past Month Alcohol Use			Past 3 Month Binge Drinking		
	<i>B</i>	<i>SE</i>	Incidence Rate Ratio	<i>B</i>	<i>SE</i>	Incidence Rate Ratio
INT general	-.279	.25	.75	-.318	.243	.72
INT depressed mood	-.265	.42	.76	-.488	.384	.61
INT worry	-.023	.30	.97	-.294	.319	.74
INT social anxiety	.011	.24	1.01	-.387†	.21	.67
Conduct problems	.150	.07	1.16	.200*	.08	1.22
Living situation	.352	.39	1.42	.869†	.53	2.38
Economic hardship	.133	.12	1.14	-.07	.14	.93
Prior alcohol problems	.144	.07	1.15	.109*	.05	1.15
Nativity	.550	.34	1.73	.789*	.33	2.20
Enculturation	-.449	.31	.63	-.249	.27	.77
Acculturation	-.040	.24	.96	.269	.22	1.30
INT General x Encult	-.086	.46	.91	-.123	.81	.88

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 305$. *B* = Unstandardized regression coefficient. *SE* = Standard error. A negative binomial regression was used for past month alcohol use and past three month binge drinking. Adolescent nativity is coded 0 for born in the United States and 1 for born in Mexico. Living situation = 0 for living with family, 1 for living outside the family home.

Figure 1. Example of a Bifactor Model

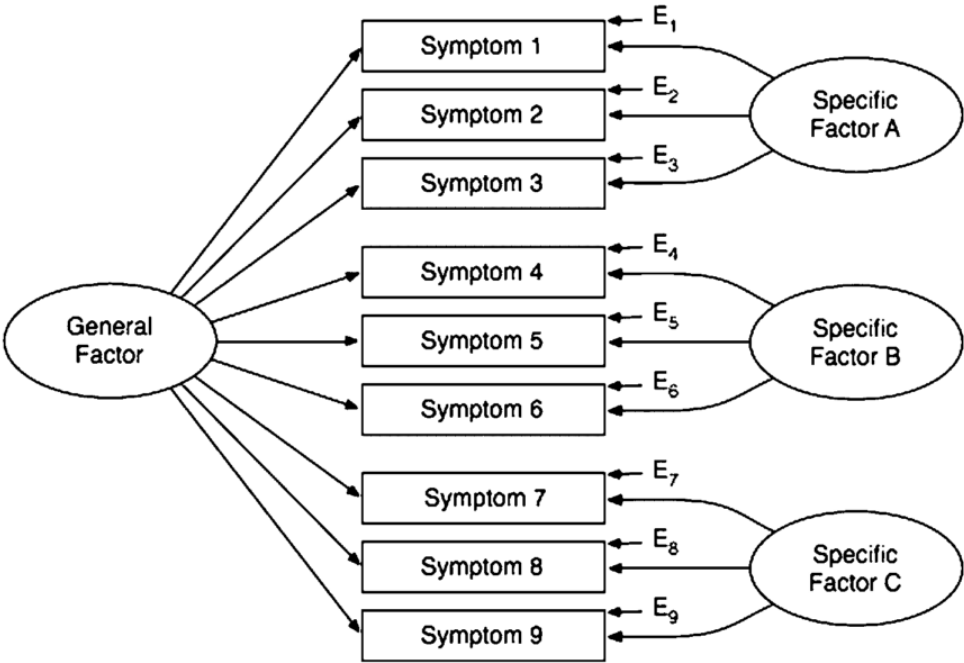


Figure 2. Factor Loading Patterns for Three Factor CFA

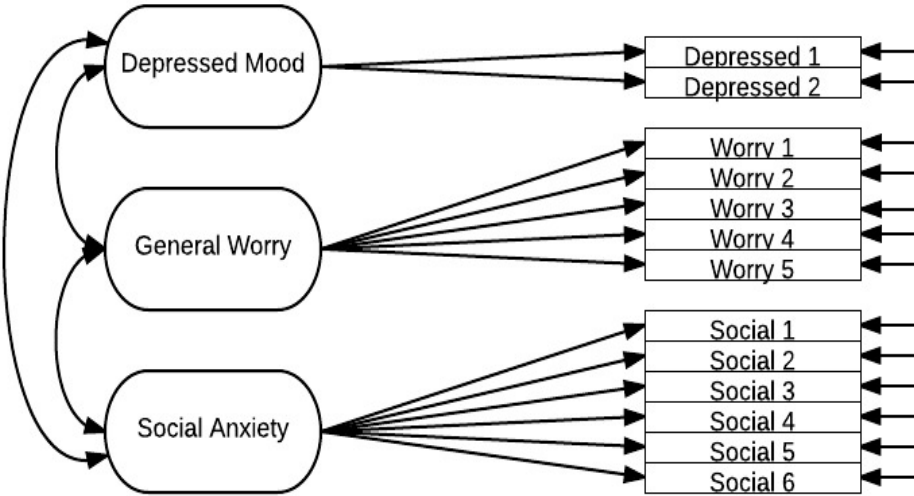


Figure 3. Factor Loading Patterns for Bifactor Model

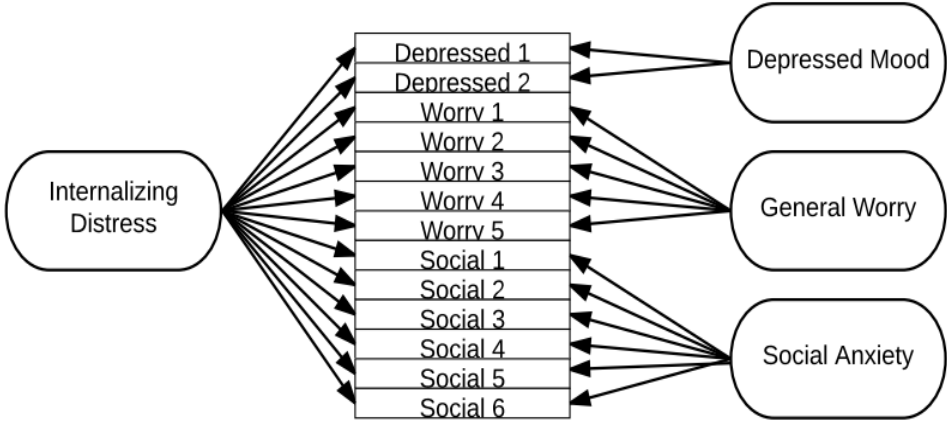


Figure 4. Factor Loading Patterns for Higher-order Model

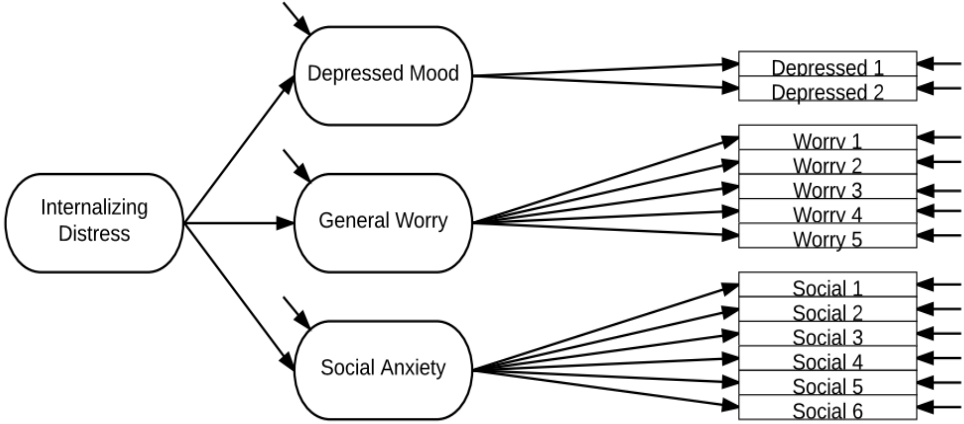


Figure 5. Full measurement model testing the role of general and specific factors of internalizing distress on alcohol use outcomes.

Note. For ease of interpretability, moderation paths not listed.

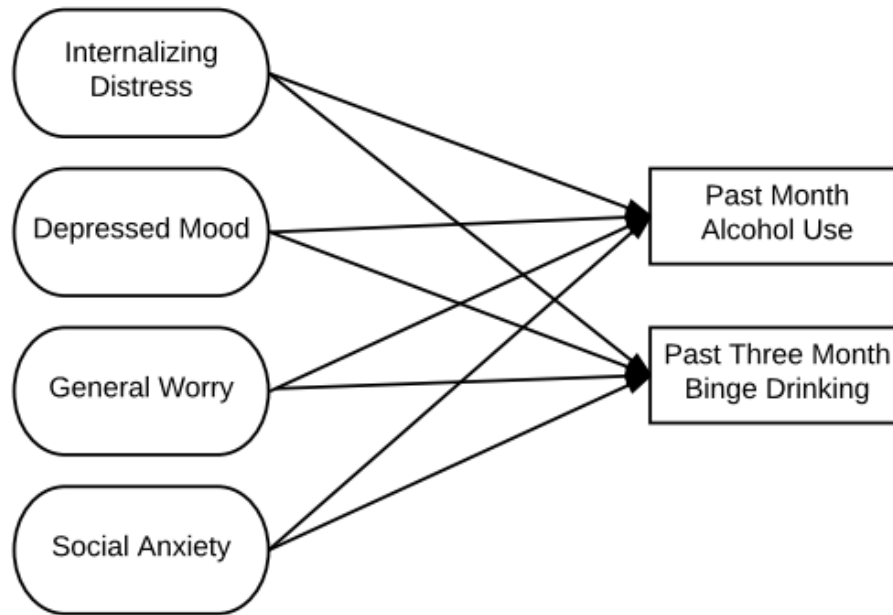


Figure 6. Significant interaction between depressed mood and prior alcohol use problems predicting frequency of past month alcohol use among girls. * $p < .05$.

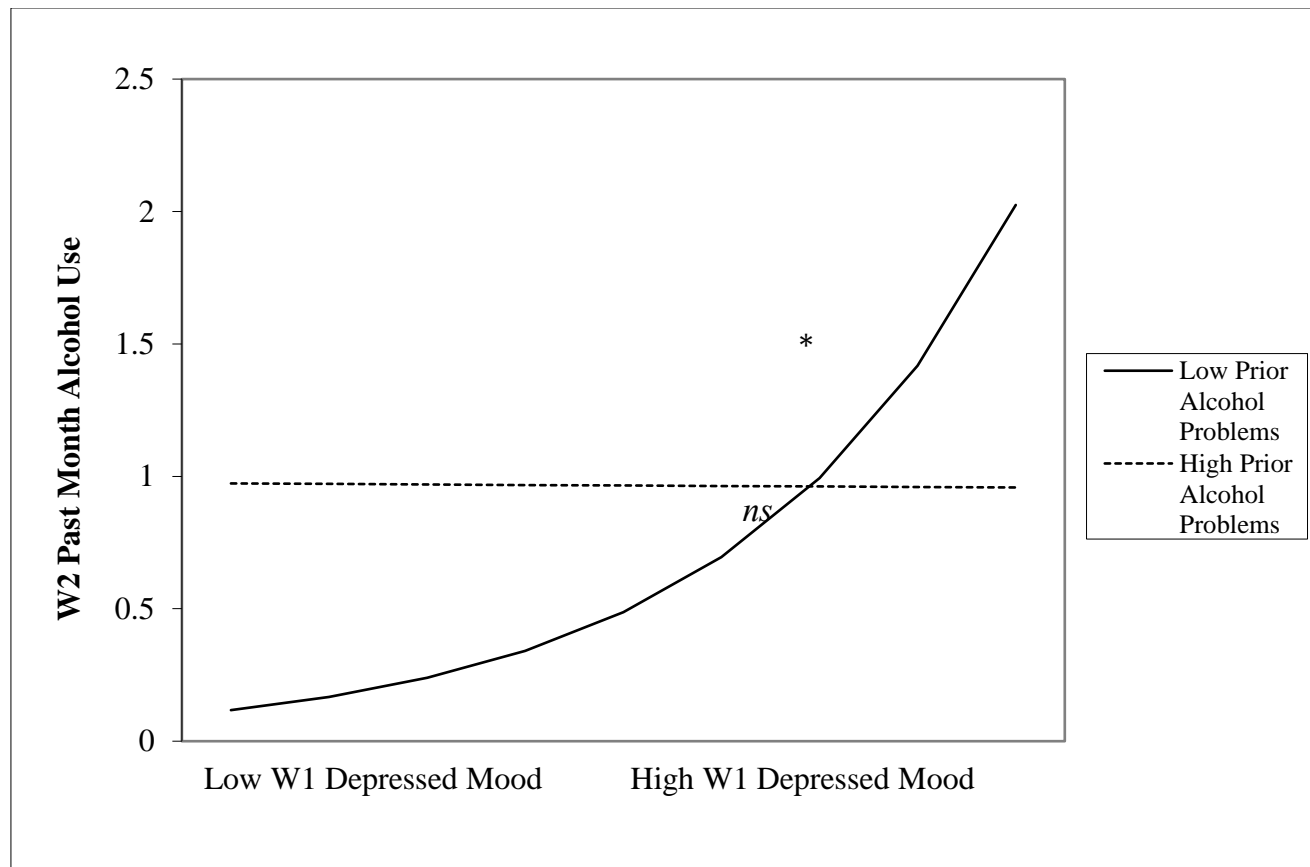


Figure 7. Significant interaction between general distress factor and acculturation predicting frequency of past month alcohol use among girls. * $p < .05$.

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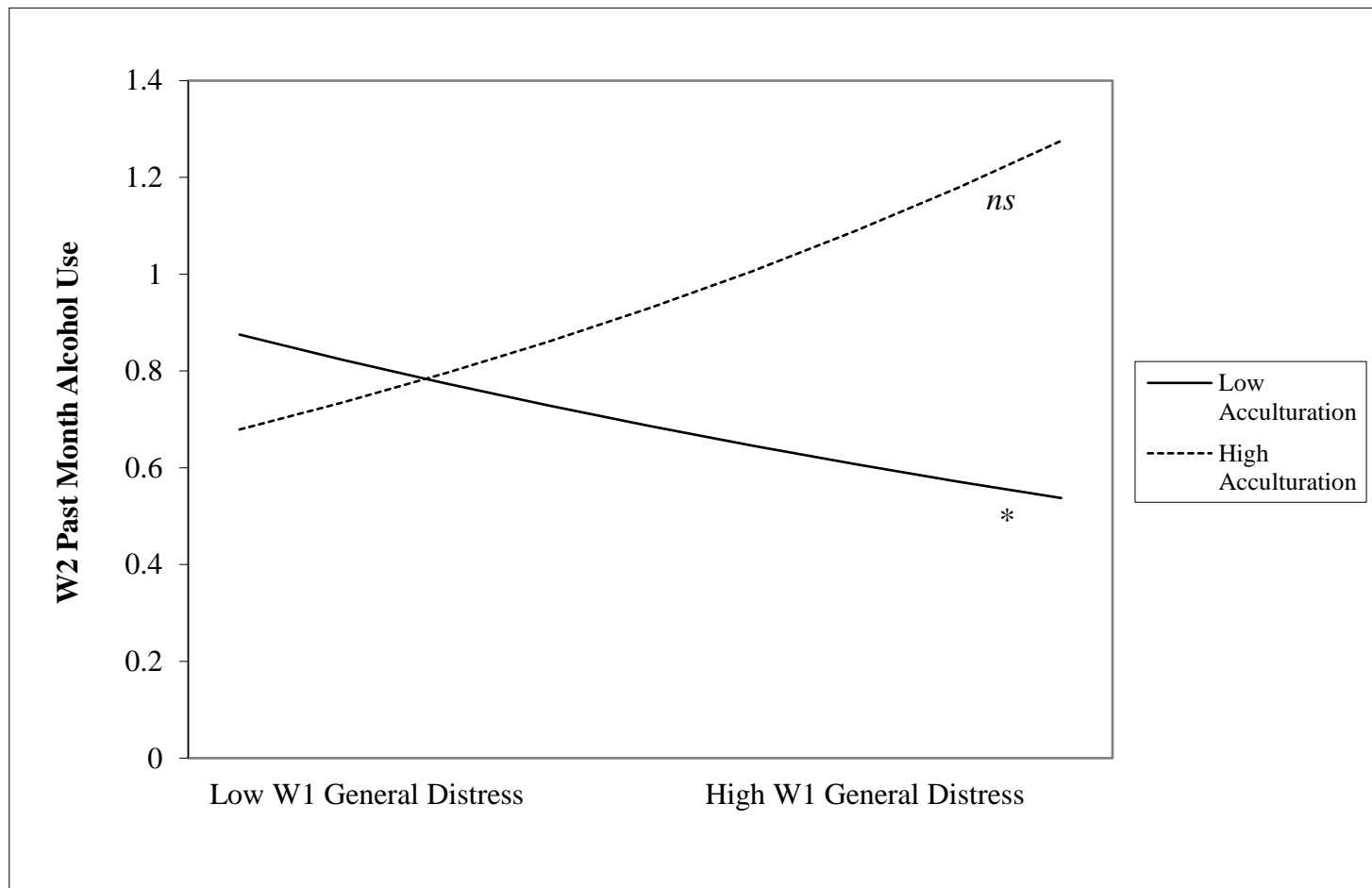
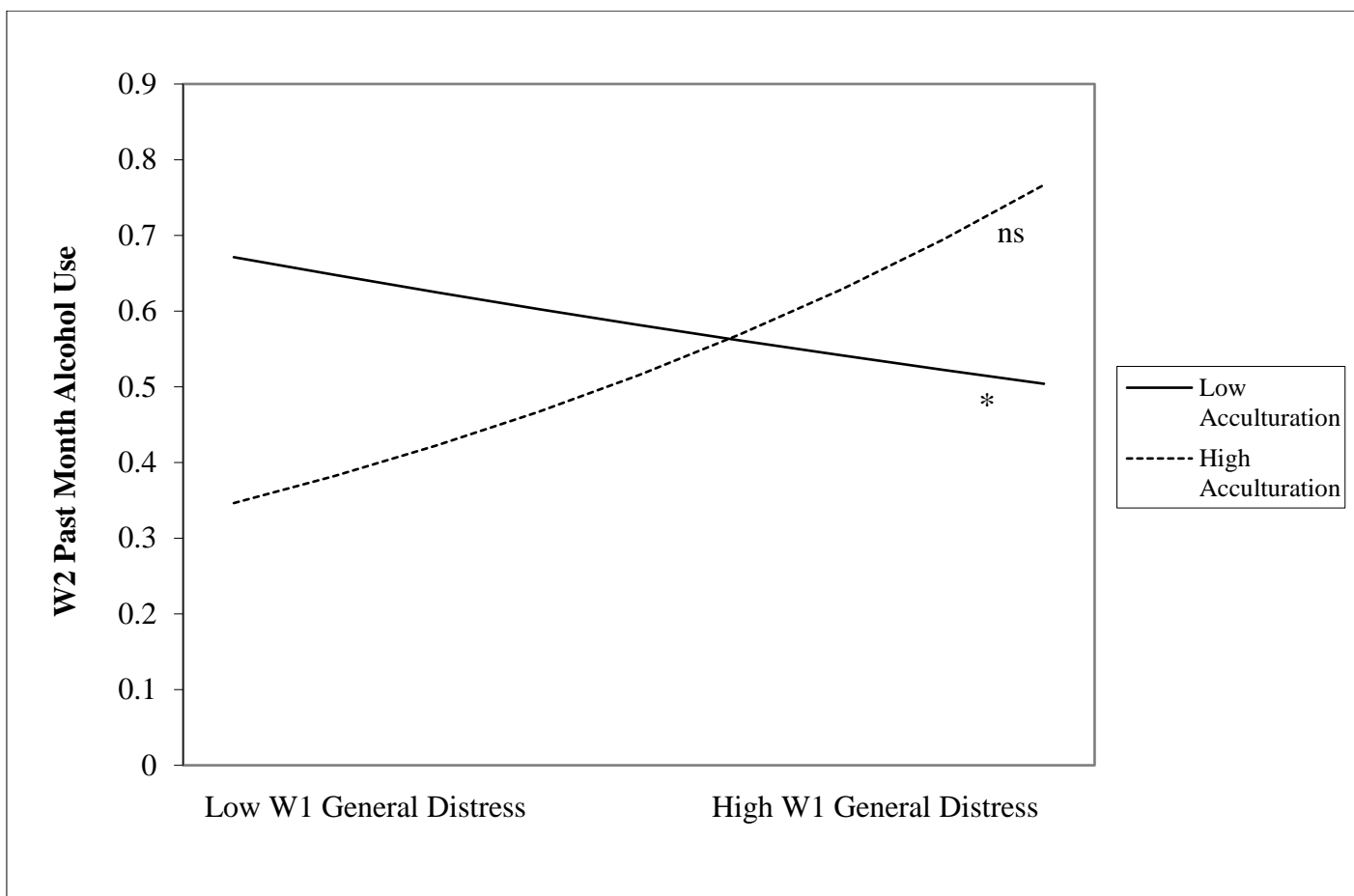


Figure 8. Significant interaction between general distress factor and acculturation predicting frequency of past month alcohol use among boys. * $p < .05$.



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APPENDIX A
DATA COLLECTED JANUARY-MAY
2017

APPENDIX A

Internalizing Distress Items from DISC

Depressed mood

1. Was there a time in the last year when you felt sad or depressed for a long time each day that last almost every day?
2. In the last year, were there two weeks in a row when you felt nothing was fun almost every day?

General Worry

1. In the last year, was there a time when you would worry even when you didn't need to, say in a subject/about something at school, where you were well prepared and always did well?
2. In the last year, did you often worry a lot before you were going to play a sport or game or do some other activity?
3. In the last year, did you often worry a lot when you made small mistakes doing (your homework or on other) projects or activities?
4. In the last year – did you often worry about being on time?
5. Thinking about the whole last year, was there a time when you worried about one thing or another on at least four days a week?

Social anxiety

1. In the last year, have you often felt very nervous or uncomfortable when you were with people you don't know well that were your own age?
2. In the last year, have you often felt very nervous or uncomfortable when you have been with a group of children/young people– say, like in the lunchroom at school, or at a party?
3. Was there a time in the last year when you felt very nervous or uncomfortable almost every time you were with people you didn't know well/were with a group of people/had to do things in front of other people?
4. In the last year, was there a time when you tried to get out of doing things where you felt nervous around other people?
5. When you felt nervous around other people, did you usually try to leave or get away as soon as you could?
6. When you were with people you didn't know well/were with a group of people/ had to do things in front of other people, did

you feel uncomfortable or nervous most of the time you were there?