

Predictors of Alcohol Use in Latin American Adolescents and Young Adults in the U.S.:
A Longitudinal Analysis

by

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Abstract

There is a need for culturally sensitive clinical interventions for substance use disorders. Parental modeling, peer alcohol use, and depression are related to alcohol use, but have not been specifically examined among Latin American adolescents and young adults in the U.S. The purpose of this study is to examine contributing factors to alcohol use in Latin American adolescents and young adults in the U.S. Participants included 400 Hispanic and Latino adolescents from the National Longitudinal Study of Adolescent Health (Add Health). Results from a path analysis suggested that parent and peer alcohol use are associated with adolescent alcohol use and that adolescent alcohol use mediates the relationship between peer alcohol use and young adult alcohol use. Clinical and research implications are described.

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Dedication

To my hero: A single mom who works hard, loves her kids, and never stops. Thank you for teaching me there's no room for "quit" in my life. I love you.

Chapter 1 - Introduction

In the United States (U.S.) it is estimated that alcohol use disorder is prevalent in 4.6% of 12 to 17 year olds (American Psychiatric Association [APA], 2013). The Centers for Disease Control and Prevention (2012) found that Latin American adolescents in the U.S. are much more likely to engage in alcohol use than their peers. Latin American adolescents in the U.S. report higher rates of alcohol use compared to other adolescents (Marsiglia, Nagoshi, Parasai, Booth, & Gonzalez Castro, 2014). Additionally, protective factors are less likely to prevent Latin American adolescents who engage in early drinking when compared to their peers (Salas-Wright, Hernandez, Maynard, Saltzman, & Vaughn, 2014). A 2005 survey of high school seniors completed by the National Institutes of Health found that White adolescents had the highest prevalence rates of heavy alcohol use (33%) followed by Latin American adolescents (25%). More recently, however, the APA (2013) reported that 6.0% of Latin American adolescents in the U.S. were diagnosed with alcohol use disorder making prevalence rates greater for this group than other racial/ethnic groups in the U.S. Studies have further found that Latin American adolescents begin using alcohol younger and accelerate their alcohol use more than other racial minority groups (Bray, Adams, Getz, & Baer, 2001; Strauch, Pinheiro, Silva, & Horta, 2009; Vieira, Ribeiro, & Laranjeira, 2007).

Adolescent alcohol use is a major issue because of its strong association with illness, health problems, and death (Brody, Flor, Hollett-Wright, & McCoy, 1998). However, alcohol use continues to become increasingly thought of as a normalized or expected behavior for adolescents (Bray et al., 2001). Brain development during adolescence, beginning at puberty, is characterized by increased reward and sensation seeking behaviors (Chassin, Sher, Hussong, & Curran, 2013). Impulse control systems are slower to develop and thus adolescents are

predisposed to risk-taking behaviors such as alcohol use. Due to their stage of development, it can be difficult for adolescents to understand the long-term effects of alcohol consumption.

Because of the serious consequences of alcohol use including impaired driving and operating machinery, difficulties at school and work, issues in interpersonal relationships and communication, worsened health, and ultimately death (APA, 2013; Brody et al., 1998; Gil & Molina, 2007), it is important to identify the contributors to alcohol use in order to develop appropriate interventions. In addition to having some relation to genetic factors, alcohol consumption is strongly associated with factors such as parental modeling and depression (Grant et al., 2006). Parental alcohol use has been shown to be one of the greatest risk factors for intergenerational transmission of alcohol use (Campbell & Oei, 2010; Chassin et al., 2012; Richter & Richter, 2001). For minority groups in particular, alcohol use in early adolescence is related to parental alcohol use (Brook et al., 2010). Given the collectivist nature of Latin American families, parents may indeed have a large influence on adolescent behavior. Because of this, parental relationships currently play a large role in alcohol use prevention (Sánchez-Queija, Oliva, Parra, & Camacho, 2016).

In addition to parental alcohol use, mental health disorders are linked to adolescent alcohol use (Brook et al, 2010). The APA (2013) stated that alcohol use disorder is associated with bipolar disorders, schizophrenia, and antisocial personality disorder. Further, it is suggested that alcohol use disorders may also be related to anxiety and depressive disorders. The effects of consuming alcohol to intoxication and the effects of withdrawal are attributed to acute symptoms of depression (APA, 2013). Although a link between adolescent alcohol use and mental health disorders exist, researchers suggest the need for additional research to further understand the directionality of this relationship (Lacruz & Lacruz, 2010).

Problematic alcohol use is a disorder that develops over time (Haller, Handley, Chassin, & Bountress, 2010). Hence, examining alcohol use from adolescence to early adulthood can help identify when clinical interventions would be most beneficial. Alcohol use generally increases over the course of time based on earlier rates of consumption (Brook et al., 2010). This means that individuals who consume lower amounts of alcohol during adolescence are expected to consume less alcohol during early adulthood, while individuals who consume higher rates of alcohol during adolescence are more likely to consume more alcohol during early adulthood (Brook et al., 2010).

Adolescent alcohol use is different across cultures and communities (Dishion & Skaggs, 2000). Therefore, unique risk and preventative factors exist for different racial/ethnic groups. Because of this, there is not one single model that can extend across cultures to account for alcohol use in all adolescents and young adults (Dishion & Skaggs, 2000). While the role parents play in socialization varies across cultures, they serve a crucial role in providing adolescents with structure. Peers are important, specifically in adolescents because a significant portion of adolescents' time is spent with their peers. Dishion and Skaggs (2000) found that adolescent substance use can change in relation to their peers' behaviors, and these changes can be drastic enough to measure differences on a monthly basis.

While other studies have evaluated the relationship between intergenerational transmission of alcohol use and psychological symptoms, many use adolescent report of parental alcohol use or have a narrow focus on early adolescents (Bray et al., 2001; Brody et al., 1998; Brook et al., 2010). Studies on substance use, emotional distress, and racial/ethnic differences either combine drug and alcohol use into one variable or have low percentages of Latin Americans in their samples (Benner & Wang, 2015; Dishion & Skaggs, 2000; Finan, Schulz,

Gordon, & Ohannessian, 2015). Additionally, research supports the need to further develop the mechanisms behind alcohol use disorders across cultures (Chassin et al., 2013). Research also supports the need for further investigation of peer influence on adolescent alcohol use as a method of informing parents and professionals about the necessity of structure and supervision for adolescents in relation to alcohol consumption (Dishion & Skaggs, 2000). Parental relationships play a large role in alcohol use prevention (Sánchez-Queija, Oliva, Parra, & Camacho, 2016), and studies have found that adolescents who receive mental health services are more likely to be specifically treated for alcohol use disorder (Wu & Ringwalt, 2006).

The aim of this study is to identify contributors to alcohol use among Latin American adolescents in the U.S. and how adolescent alcohol use is associated with young adulthood alcohol use. This study will examine the role of parental alcohol use, peer alcohol use, and depression on alcohol use during adolescence and young adulthood. This information may help with the development of age- appropriate, culturally sensitive treatments.

Chapter 2 - Review of Literature

Alcohol Use Through a Social Learning Theory Lens

Alcohol consumption in adolescents and young adults has both biological and social components (Brook et al., 2010). While genetics may partially explain alcohol use in adolescents and young adults, social learning theory stresses the importance of environment and learned behavior. Social learning theory may also be useful to explain other predictors associated with alcohol use such as the familial, social, and psychological risk factors (Brook et al., 2010). Social learning theory suggests that patterns of behavior are acquired in social contexts through the process of observation, known as modeling, and direct experience (Bandura, 1977; Bandura & Walters, 1963).

Parental Alcohol Use as a Predictor of Adolescent and Young Adult Alcohol Use

The pattern of alcohol use which spreads from one generation of family members to the next is known as an intergenerational transmission of alcohol use (Markward, Dozier, Hooks, & Markward, 2000). One of the greatest risk factors for alcohol use in adolescents and young adults is a history of familial problems with alcohol use (e.g., Campbell & Oei, 2010; Richter & Richter, 2001). Additionally, exposure to parental alcohol use tends to intensify adolescent substance use (Braciszewski & Stout, 2012; Brook et al., 2010). Because of this, parents can act as a preventative factor or a risk factor for adolescent alcohol use (de Oliveira Benites & Schneider, 2014). Social learning theory emphasizes the importance of parental modeling of alcohol use as the adolescent may perceive there to be a sense of normalcy around drinking (Bandura, 1986; Campbell & Oei, 2010).

Families experience different stages of development and when alcohol use is introduced into a family, the homeostasis is shifted and rigidity is often the outcome (Hurcom, Copello, &

Orford, 2000). Instead of having a healthy balance of stability and growth, rigidity results in unhealthy patterns to develop. Intergenerational transmission occurs when families feel the need to maintain this new rigidity by continuing to deal with alcohol use. Parental alcohol use serves a function that extends to each family member and creates a sense of predictability and consistency, which is preferable to chaos despite any negative effects they may experience as a result of the alcohol use. Adolescents learn that alcohol allows for a sense of structure within the family and may emulate their parents' behaviors to gain a sense of regularity in their lives (Hurcom et al., 2000). Because modeling behaviors is important for development, studies have shown that adolescent alcohol use is linked with parental recovery (Chen & Weitzman, 2005). Although a familial connection has been well-documented, it is unclear if the mechanisms behind this relationship are due to parental alcohol use directly or affected by other variables such as peer influence or environment (Campbell & Oei, 2010; Haller et al., 2010).

Peer Alcohol Use as a Predictor of Adolescent and Young Adult Alcohol Use

Peers who promote substance use have been associated with increased rates of alcohol use in adolescents (Haller et al., 2010). The number of close friends engaging in alcohol consumption has also been associated with frequency of alcohol use in adolescents (Soloski, Monk, & Durtschi, 2015), and has implications for young adult substance use disorders (Haller et al., 2010). Alcohol use may allow adolescents and young adults an avenue to establish friendships (Dishion & Skaggs, 2000). This may be especially important to consider in minority populations. Benner and Wang (2015) suggested that Latin American adolescents may encounter more pronounced problems with having fewer same race peers in school compared to White adolescents, because despite actual numerical representation, White adolescents receive inherent

benefits as a factor of their social position in society. Additionally, fewer opportunities may exist for White adolescents to be exposed to substance use (Benner & Wang, 2015).

In addition to parental modeling of behavior, peer modeling should be considered because adolescents and young adults may focus more of their time on gaining the approval of their peers rather than their parents. Consistent with social learning theory that posits that the individuals who adolescents associate with predicts the types of behaviors learned and practiced (Bandura, 1977), adolescent alcohol use has been found to be associated with peer influence (Bray, Adams, Getz, & McQueen, 2003; Dishion & Skaggs, 2000; Nash, McQueen, & Bray, 2005). More specifically, Cruz, Emery, and Turkheimer (2012) found that adolescent alcohol use is associated with peer group substance use such that an increase in peer substance use predicts an increase in adolescent alcohol use especially when the peers are close friends. Problematic alcohol use was further found to increase at greater rates during early and middle adolescence (Cruz et al., 2012). In adolescent alcohol use, peers may serve to reinforce modeling of parental alcohol use or can be the sole model for alcohol use.

It is also possible that adolescents and young adults who consume alcohol at higher rates are not only influenced by their peers, but also have more contact with peers who use alcohol at similar rates (Dishion & Skaggs, 2000). Popularity, a measurement of peer status and potential for influence, is associated with adolescent alcohol use in Latin American adolescents (Choukas-Bradley et al., 2015). Because reinforcement is a facilitator of behavior rather than a necessary part of modeling, more importance is placed on the amount of attention given to an observed behavior (Bandura, 1977). Further, social learning theory specifies that learning can occur through vicarious reinforcement where there is an absence of a behavior being repeated and instead observation of punishment and reward (Bandura, 1977). Intervening at the peer and

individual levels may be the most effective combination to address adolescent and young adult alcohol use (Bray et al., 2003).

Risk behaviors develop within a social context for adolescents (Choukas-Bradley, Giletta, Neblett, & Prinsein, 2015). The strongest evidence in support of the influence of peer alcohol use on adolescent alcohol use comes from studies which attempt to lessen the normative acceptance of alcohol use as a method of reducing alcohol consumption (Brooks-Russell, Simons-Morton, Haynie, Farhat, & Wang, 2014). Adolescents may desire social acceptance from their peers and perceive this as a reward for drinking behavior. As social learning theory suggests, adolescents will weigh the benefits and consequences and act in the manner they perceive to have the most appealing results (Bandura, 1977). Because of their stage of development, adolescents may be likely to engage in the drinking behavior to gain perceived social benefits (Brooks-Russell et al., 2014). Research suggested that cultural contexts may strongly affect the association between adolescent alcohol use and status among their peers (Choukas-Bradley et al., 2015).

Depression as a Moderator of Alcohol Use

Depressive symptoms and alcohol use are also related (Brook et al., 2010). Adolescents who are at increased risk for mental health disorders are more likely to develop substance use disorders, and adolescents who abuse alcohol are more likely to suffer from mental health problems than adolescents who do not abuse alcohol (Lacruz & Lacruz, 2010). For example, there is an increased rate of depression in adolescents with alcohol use disorders when compared to their peers (Clark et al., 1997; Clark, De Bellis, Lynch, Cornelius, & Martin, 2003). Because mental health issues are highly comorbid with substance use disorders (Clark et al., 2003; Rao, 2010), it is vital to address their influence on adolescent alcohol consumption. Parental alcohol use has negative effects on adolescents such that they are more prone to emotional difficulties

compared to their adolescent peers whose parents do not experience issues with alcohol consumption (Chen & Weitzman, 2005; Hurcom et al., 2000). Alcohol use has been shown to increase with higher rates of mental illness and continues to escalate throughout adolescent development (Braciszewski & Stout, 2012). Minority adolescents, such as Latin Americans, have more depressive symptoms than their classmates, which has also been linked with higher rates of alcohol consumption (Benner & Wang, 2015). Because of this, depression will be tested as a moderator.

Social learning theory suggests that certain stimuli can be emotionally arousing, especially if they have been continually associated with previous experiences that have had negative outcomes, and this arousal can trigger anger, distress, and other emotions (Bandura, 1977). Similar to behavioral responses, emotional responses are learned through vicarious conditioning in which another person conveys messages through verbal and non-verbal responses. Behavior is internally regulated through consequences individuals produce for themselves. This can be troublesome if self-regulated consequences become too harsh. Extreme self-punishment can lead to depressive symptoms, feelings of worthlessness and feelings of low self-worth, and ultimately, may reinforce substance use behaviors (Bandura, 1977).

Purpose of This Study

The purpose of this study was to identify contributors to alcohol use among Latin American adolescents and young adults in the U.S. How depression is linked with the intergenerational transmission of alcohol use and peer alcohol consumption on alcohol use by Latin Americans were examined via a path analysis. Participants included Latinos and Hispanics from the National Longitudinal Study of Adolescent Health (Add Health) (Harris & Udry, 1994-

2009). The first three waves of data (1995-2002) were included in this study. The following hypotheses were tested:

H1: Parent alcohol use and peer alcohol use will predict alcohol use at adolescence and young adulthood.

H2: Adolescent alcohol use will mediate the relationship between parent alcohol use and peer alcohol use, and young adult alcohol use.

H3: Adolescent depression will moderate the relationship between parent alcohol use and peer alcohol use, and adolescent alcohol use.

H4: Young adult depression will moderate the relationship between adolescent alcohol use, parent alcohol use and peer alcohol use, and young adult alcohol use.

Chapter 3 - Method

Sample

Data from the National Longitudinal Study of Adolescent Health (Add Health) (Harris & Udry, 1994-2008) were used. This dataset consisted of adolescents from a nationally representative sample in the U.S. Data were collected from schools that were selected using a random, stratified sample of all high schools in the U.S. that had at least 30 students and an 11th grade. Less than 30% of the schools that were originally selected for the study declined to participate in the study. Each school that declined was replaced by another school in the same stratum. Additionally, schools that did not include grades 7 to 12 were matched with a feeder school. Schools that sent a minimum of five graduates to a high school were considered a feeder school for that high school. One of these schools was selected to participate in the study and was replaced by another if the school declined to participate. Overall, there were 132 schools from 80 communities that participated in the study.

The participants were first surveyed in 1995, while students were in grades 7 to 12. Every student attending the selected schools was asked to complete the self-report questionnaire. Overall, information was gathered from more than 90,000 students. During the in-home portion of the survey, information was gathered from around 17,700 primary caregivers. If possible, the caregiver who was selected to complete the interview was the mother.

The survey was given at multiple waves. The Add Health study consists of a total of five waves. Wave I (1995) conducted in two stages. The first stage was administered at school. Based on their in-school questionnaire, 27,000 adolescents were selected to complete an in-home questionnaire. Their parents were also asked to complete a questionnaire that consisted of items about family and relationships.

Wave II was conducted in 1996 via in-home interviews. This sample was mostly the same as the sample that completed the in-home interviews during Wave I. The interview in wave II was generally similar to the interview conducted during Wave I. Unlike Wave I, the parents were not asked to complete surveys during Wave II. However, school administrators were asked to provide updated information about the schools that were included.

Wave III was taken by the participants ($n = 15,197$) and their romantic partners ($n = 1,507$) in 2001 to 2002. The participants were between the ages of 18 and 26 and were considered young adults. Variables from the first three waves were used in the current study. Wave IV was given when the participants ($n = 15,701$) were between 24 and 32 years old. Finally, Wave V is currently being administered and the participants will be between the ages of 31 and 42.

Participants

The public use data set ($n = 6,504$) for Wave I, Wave II, and Wave III was used for the current study. Participants were selected if they answered “yes” to being either Hispanic or Latino ($n = 743$) and provided information about their gender (males = 215 and females = 185). The age of participants at Wave II ranged from 13 to 21 ($M = 16.00$, $SD = 1.59$) and from 18 to 26 ($M = 21.67$, $SD = 1.75$) at Wave III.

Measures

Parent alcohol use. This variable was developed by taking the sum of three questions on alcohol use by parents and parents’ spouse/partner where higher scores indicated more alcohol use. Parents were asked about their alcohol consumption during the second stage of Wave I. The first question included in this variable was, “How often do you drink alcohol?” Responses were coded as 1 = *never*, 2 = *once a month or less*, 3 = *two or three days a month*, 4 = *once or twice a*

week, 5 = three to five days a week, 6 = nearly every day. The second question was, “How often in the last month have you had five or more drinks on one occasion?” Responses were coded as 1 = *never*, 2 = *once*, 3 = *twice*, 4 = *three times*, 5 = *four times*, 6 = *five or more times*. The third question was, “During the past 12 months, about how often did your current spouse/partner drink alcohol?” Responses were coded as 1 = *never*, 2 = *once a month or less*, 3 = *two or three days a month*, 4 = *once or twice a week*, 5 = *three to five days a week*, 6 = *nearly every day*. Participants who refused to answer, did not answer, did not have a partner, or answered that they did not know were coded as missing data. An exploratory factor analysis found that these items loaded together to account for 58.97% ($\alpha = .61$) of the construct measured.

Peer alcohol use. This variable was measured during Wave I with the question “Of your 3 best friends, how many drink alcohol at least once a month?” Responses were coded as 1 = *no friends*, 2 = *one friend*, 3 = *two friends*, 4 = *three friends*. Higher scores indicated more friends who used alcohol at least once a month. Participants who refused to answer, did not answer, or answered that they did not know were coded as missing data.

Adolescent and young adult depression. A mental health variable for depression was developed by taking the sum of four questions assessed at Wave II and Wave III, where higher scores indicate higher levels of depression. The questions asked participants to rate how often each of the following were true during the past seven days: 1) you could not shake off the blues, even with help from your family and your friends, 2) you were depressed, 3) you were sad, 4) you were bothered by things that usually don’t bother you (Responses were coded as 1 = *never or rarely*, 2 = *sometimes*, 3 = *a lot of the time*, 4 = *most of the time or all of the time*). The following responses were coded as missing: refused, don’t know, not applicable. An exploratory

factor analysis found that the items loaded together to account for 64.57% ($\alpha = .82$) of the constructed variable at Wave II and 67.96% ($\alpha = .84$) of the constructed variable at Wave III.

Adolescent and young adult alcohol use. Adolescents were asked about the frequency of their alcohol use over the past 12 months at Waves II and III. Three questions were summed to develop this variable where higher scores indicate higher levels of alcohol use: “How many days did you drink alcohol?”, “How many days did you drink five or more drinks in row?”, “How many days have you gotten drunk or ‘very, very high’ on alcohol?” Responses were coded 1 = *never or did not drink alcohol in past twelve months*, 2 = *one or two days in the past twelve months*, 3 = *once a month or less (three to twelve times in the past twelve months)*, 4 = *two or three days a month*, 5 = *one or two days a week*, 6 = *three to five days a week*, 7 = *every day or almost every day*. An exploratory factor analysis found that the items loaded together to account for 81.44% ($\alpha = .88$) of the constructed variable at Wave II and 82.3% ($\alpha = .89$) of the constructed variable at Wave III.

Control Variables

In order to determine the unique effects of predictor variables (parent use of alcohol, peer use of alcohol, adolescent alcohol use, and adolescent depression), contextual factors such as participant and parent gender, participant and parent age, household income, parent marital status, parent country of birth, and neighborhood drug problems were included in the model as control variables. Literature on these variables are described below and descriptive statistics are provided in Table 1.

Gender. Finan et al. (2015) suggested that exploring gender is important when examining the intergenerational transmission of alcohol use. Current findings in literature are not clear about differences for males and females in long-term effects of familial influences on

alcohol problems (Galif, 2001). In fact, existing literature is often ungeneralizable to female or other minority populations (Grant et al., 2006). Some studies have provided evidence that the risk of adolescent alcohol use due to parental alcohol use is different across genders (Chen & Weitzman, 2005). Social and psychological elements interplay with gender during adolescence, as males are at a greater risk for problem consumption of alcohol, and are more commonly diagnosed with substance use disorders, than females (Brook et al., 2010). However, some studies have indicated that diagnosis of alcohol use disorders often occur much earlier for female adolescents than male adolescents (Lewinsohn, Rohde, & Seeley, 1996). While adolescents face similar difficulties, males are often at an elevated risk for alcohol abuse as they move closer to adulthood (Schulte, Ramo, & Brown, 2009). Benner and Wang (2015) found that depressive symptoms and substance use were more strongly associated for female adolescents than for their male counterparts. In the current study, 304 parents identified as female, 12 as male and 84 did not disclose their gender. Males were coded as “1” and females as “2”.

Age. In the current study, parents were between 20 to 70 years old ($Mean = 41.06$, $SD = 6.62$). Adolescents were between 13 to 21 years old ($M = 16.00$, $SD = 1.59$). Young adults were between 18 to 26 years old ($Mean = 21.67$, $SD = 1.75$).

Parent marital status. Adolescents and young adults from single-parent families report significantly higher levels of issues with substance use than those from intact families (Barrett & Turner, 2005; Zeiders, Roosa, & Tein, 2011). Adolescents from single-parent households are significantly more likely to use substances than those from intact families and have a higher association with deviant peers (Barrett & Turner, 2005; Hemovich & Crano, 2009). Further, alcohol use was reported notably more in single-father households than dual or single-mother

households, and this was especially true for adolescent females living in single-father households (Goodman & Huang, 2002).

Barrett and Turner (2005) found that there were significantly fewer minority populations who lived in mother-father households when compared with White adolescents. Single-parent households have significantly increased among Mexican Americans (Landale, Oropesa, & Bradatan, 2006). Adolescents from single-parent households experience increased stress from economic difficulties and other environmental factors (Zeiders et al., 2011). Considering parent marital status is also important for Latin American populations because cultural values and family processes differ in single versus two-parent households (Zeiders et al., 2011). In the current study, 220 parents identified as married, 105 as either single, divorced or separated, and 75 did not disclose their relationship status.

Parents' country of birth. Immigration stress related to immigrant status, racial prejudices and acculturation (Baily, 2013; Cano et al., 2017, Gorman, Read, & Krueger, 2010; Martinez, 2006; Zapata Roblyer, Grzywacz, Cervantes, & Merten, 2015) has been associated with higher alcohol use for Latin Americans in the U.S. (Cano et al., 2017). The risk of adolescent substance use increases significantly as the gap is between parental and adolescent acculturation increases (Martinez, 2006). In addition, immigration stress may be more intense for men compared to women as there may be a difference in cultural stressors due to Latin American men being viewed by society as threatening (Baily, 2013; Gorman et al., 2010). In the current study, parents were asked their country of birth: 146 parents responded that they were born in the U.S. (coded as 1), 181 were not born in the U.S. (coded as 2), and 73 did not provide an answer.

Neighborhood drug problem. Neighborhoods provide feedback on adolescent behavior and are an essential influence during development (Jackson et al., 2016), as adolescent alcohol

use is related to neighborhood stress (Scheier, Botvin, & Miller, 1999). Increased adolescent alcohol use is associated with disadvantaged neighborhoods where low levels of socioeconomic status increased adolescents' likelihood of consuming alcohol (Chuang, Ennett, Bauman, & Foshee, 2005). In the current study, when parents were asked at Wave I how big a problem were drug dealers and drug users in the neighborhood, 175 said it was not a problem at all (43.8%), 99 said it was a small problem, 44 said it was a big problem, and 81 did not respond. Higher scores indicated more problems with drugs in the neighborhood.

Household income. Household income that could influence choice of neighborhood and in turn extent of exposure to drugs was controlled for in this study. Family's household income at Wave I ranged from \$0 to \$999,000 (Mean = \$34,780, SD = \$30,780).

Data analysis plan. Mplus v7 (Muthén & Muthén, 1998-2015) was used to test the model shown in Figure 1. Full information maximum likelihood estimation (FIML) was used to address missingness in the data. Indirect effects was tested using bootstrap analyses with 2,000 bootstraps (Preacher & Hayes, 2008). Acceptable model fit between the model and the observed data was evaluated using the following indices and guidelines: a non-significant Chi-square statistic, Comparative Fit Index (CFI) and Tucker-Lewis Index values greater than .95, a Root Mean Square Error of Approximation (RMSEA) value below .08, and a Standardized Root Mean Square Residual (SRMR) value below .08 (Hu & Bentler, 1999; Kline, 2011). To achieve a good fitting model, paths that were non-significant beginning with control variable were eliminated sequentially.

Chapter 4 - Results

Preliminary Analysis

Preliminary analyses were completed using IBM SPSS Version 24 (2016) to assess for normality. All items included above had an acceptable range of normality, where skewness and kurtosis were less than 1 (Byrne, 2012). Exploratory factor analysis using maximum likelihood analysis was conducted to identify the underlying relationships between items for each variable above and reliability estimates computed.

Exploratory factor analysis for parent alcohol use found all three items loaded together accounting for 41.32% ($\alpha = .61$) of construct measured. All four items for the depression variable also loaded together accounting for 53.04% ($\alpha = .82$) of the constructed variable at Wave II and 58.51% ($\alpha = .84$) of the constructed variable at Wave III. The three items for adolescent alcohol use loaded together accounting for 72.42% ($\alpha = .88$) of the constructed variable at Wave II and 73.94% ($\alpha = .89$) of the constructed variable at Wave III. Each variable score was calculated as the mean of the sum of the items and standardized for analysis. For each variable, high scores reflected more use of alcohol or high levels of depression. Descriptive statistics and bivariate correlations are presented in Table 2.

Adolescent alcohol use at Wave II was significantly correlated with young adult alcohol use at Wave III ($r = .45, p = .001$), adolescent gender ($r = -.16, p = .03$), neighborhood drug problems ($r = -.02, p = .04$), peer alcohol use at Wave I ($r = 0.32, p = .001$), and parent alcohol use at Wave I ($r = 0.23, p = .04$). Young adult alcohol use at Wave III was significantly correlated with adolescent gender ($r = -.21, p = .004$), parent country of birth ($r = .37, p < .001$), and young adult depression at Wave III ($r = .14, p = .03$). Adolescent depression at Wave II was significantly correlated to adolescent gender ($r = .20, p = .001$), parent country of birth ($r = .13, p$

= .03), and peer alcohol use ($r = .20, p = .001$). Peer alcohol use at Wave I was significantly related to parent country of birth ($r = .20, p < .001$), and young adult age at Wave III ($r = .22, p < .001$). Parent alcohol use at Wave I was significantly related with parent country of birth ($r = 0.22, p = .001$). Young adult depression at Wave III was significantly related with adolescent depression at Wave II ($r = 0.39, p < .001$).

Model Fit

The initial path analysis, with contextual factors such as participant and parent gender, participant and parent age, household income, parent marital status, parent country of birth, and neighborhood drug problems as control variables, produced a poor fitting model $\chi^2(9) = 11.45, p = 0.25$; RMSEA = 0.03, CFI = 0.97, TLI = 0.88, and SRMR = 0.01. To improve model fit, control variables that produced non-significant results were deleted sequentially. Four control variables were removed from the model before the overall fit indices produced an acceptable model. These variables were removed sequentially and produced the following fit indices: 1) parent gender ($\chi^2(9) = 11.21, p = 0.26$; RMSEA = 0.02, CFI = 0.97, TLI = 0.89, and SRMR = 0.01), 2) parent age ($\chi^2(8) = 10.29, p = 0.25$; RMSEA = 0.03, CFI = 0.97, TLI = 0.88, and SRMR = 0.01), 3) household income ($\chi^2(8) = 10.60, p = 0.22$; RMSEA = 0.03, CFI = 0.97, TLI = 0.87, and SRMR = 0.01), and 4) parent marital status ($\chi^2(8) = 8.91, p = 0.35$; RMSEA = 0.02, CFI = 0.99, TLI = 0.96, and SRMR = 0.01). The path coefficients of this final model is presented in Table 2.

Path Analysis

Results of the path analysis are presented in Table 3 and detailed below.

Hypothesis 1: Parent alcohol use and peer alcohol use will predict alcohol use at adolescence and young adulthood. This hypothesis was partially supported as parent alcohol use

at Wave I significantly predicted adolescent alcohol use at Wave II ($\beta = .20, p = .035$) and peer alcohol use significantly predicted adolescent alcohol use ($\beta = .26, p < .001$). However, young adult alcohol use was not predicted by parental alcohol use ($\beta = .05, p = .61$) or peer alcohol use ($\beta = -.03, p = .69$).

Hypothesis 2: Adolescent alcohol use will mediate the relationship between parent alcohol use and peer alcohol use, and young adult alcohol use. This hypothesis was partially supported as adolescent use of alcohol mediated the association between peer alcohol use and young adult use of alcohol ($\beta = .08, p = .04, CI = .03, .17$).

Hypothesis 3: Adolescent depression will moderate the relationship between parent alcohol use and peer alcohol use, and adolescent alcohol use. This hypothesis was not supported. Adolescent depression use did not moderate the relationship between parent alcohol use ($\beta = -.01, p = .92$) or peer alcohol use ($\beta = -.04, p = .57$) and adolescent alcohol use.

Hypothesis 4: Young adult depression will moderate the relationship between adolescent alcohol use, parent alcohol use and peer alcohol use, and young adult alcohol use. This hypothesis was not supported. Young adult depression did not moderate the relationship between adolescent alcohol use ($\beta = -.18, p = .20$), parent alcohol use ($\beta = .18, p = .12$), or peer alcohol use ($\beta = -.02, p = .75$) and young adult alcohol use. Depression however, was significantly linked with young adult alcohol use ($\beta = .19, p = .03$), indicating that higher depression meant more alcohol use.

Overall, parent and peer alcohol use, parent country of birth, neighborhood drug problems, adolescent age and gender accounted for 22.2% of the variance in adolescent alcohol use ($p = .001$). Adolescent, parent and peer alcohol use, parent country of birth, neighborhood

drug problems, adolescent age and gender accounted for 33.8% of the variance in young adult alcohol use ($p < .001$).

Chapter 5 - Discussion

The purpose of this study was to identify contributors to alcohol use among Latin American adolescents and young adults in the U.S. The role of parental alcohol use, peer alcohol use and depression on alcohol use during adolescence and young adulthood was examined via path analysis.

Adolescent Alcohol Use and Parent Alcohol Use

This study found that parent alcohol use was a significant predictor of adolescent alcohol use. This supports current literature which not only supports the relationship between adolescent alcohol use and parent alcohol use, but has found parental alcohol use to be one of the greatest risk factors for intergenerational transmission of alcohol use (e.g. Campbell & Oei, 2010; Richter & Richter, 2001). While the connection between parental and adolescent alcohol use has been well-documented, literature has been unclear whether the relationship occurs as a direct relationship or as a result of other variables such as peer alcohol use (Campbell & Oei, 2010; Haller et al., 2010). This study supports Crosnoe and McNeely (2008) in their findings that adolescent alcohol use is best understood with consideration of peer relationships due to their importance in adolescent development. Because peer alcohol use was significantly associated with adolescent alcohol use, this study supports findings that adolescent alcohol use may occur with friends in social contexts (Brooks-Russell et al., 2014).

Peer, Adolescent, and Young Adult Alcohol Use

Peer influence on young adult alcohol use was supported throughout the literature (Bray et al., 2003; Dishion & Skaggs, 2000; Haller et al., 2010; Soloski et al., 2015). These results indicate the importance of adolescent alcohol use as a link in the relationship between peer alcohol use and young adult alcohol use. This was also indicative of problem alcohol use as a

disorder that develops over time. Not only have peers been associated with higher rates of alcohol use in adolescents (Haller et al., 2010), but the rate of alcohol use during adolescence was also associated with rates of alcohol use in early adulthood (Brook et al., 2010). This finding gives support to the idea that peer modeling of behavior is important to learned behaviors. As Bandura (1977) suggests, behavior modeling by parents may not be as crucial during adolescent years because adolescents do not learn modeled behavior, which does not capture their attention.

Alcohol Use and Depression

Though depressive symptoms are linked to alcohol consumption (e.g. Brook et al., 2010; Clark et al., 1997; Clark et al., 2003; Lacruz & Lacruz, 2010), the findings of the current study indicate that depression may be a stronger predictor of alcohol consumption during early adulthood than during adolescence. The results of this study showed that peer alcohol use was a better predictor of adolescent alcohol use than depression. Adolescents may be more vulnerable to external than internal influences. Social learning theory posits that behavior is externally regulated by consequences from others and internally regulated by consequences individuals produce for themselves. This process can lead to depressive symptoms, feelings of worthlessness and low self-worth, if individuals place consequences on themselves that are too harsh (Bandura, 1977).

Control Variables

Results of the control variables, although not the primary focus of this study, can inform clinical work and future research. The influence of exposure to drugs in one's neighborhood on adolescent alcohol use supports Bandura's (1977) view of how neighborhoods are crucial to development during adolescence, as a place where consequences of behavior is learned. Interestingly, the more problems with drugs in the neighborhood, the less likely adolescents used

alcohol. It is possible that observing the negative consequences of alcohol consumption was sufficient to convince adolescents to avoid of alcohol.

While gender was significant across both adolescent and young adult alcohol use, it was a more significant predictor of young adult alcohol use, with women using less alcohol than men. While the exact mechanisms behind gender differences is unclear, these results provide support for future research to further investigate gender differences.

Parent country of birth could infer the families' immigration generation. It appears that having parents born outside the U.S. (i.e., first generation immigrant parents) may put young adults at risk of higher consumption of alcohol. This finding was consistent with prior studies that associate unique stressors from acculturating to a new culture with alcohol consumption (Baily, 2013; Cano et al., 2017; Gorman et al., 2006; Zapata et al., 2010). However, literature suggests that each successive generation in the U.S. becomes more assimilated, and the larger the gap between generational assimilation the greater the risk of alcohol use (Martinez, 2006; McNulty Eitle et al., 2009). If this was the case, adolescent and not young adults should be more affected by acculturation stress. It is possible that young adults having left home become less connected to their families as they acculturate to the U.S. culture and are more susceptible to using alcohol to cope with life stresses.

Contributions

The current study is one of the few longitudinal studies on predictors of alcohol use in Latin American adolescents and young adults. Specifically, it is one of the few longitudinal studies which uses a nationally representative sample. The current study also has a longer period between data collection than most current studies. Additionally, other studies that explore alcohol use in minority populations have small percentages of Latin American participants

whereas this study focused specifically on this population. The current study was also able to use a wider age range of adolescents and young adults than previous studies by controlling for age. This study is beneficial because of the use of parental report of alcohol use whereas much of current literature on predictors of alcohol consumption uses adolescent report of parental alcohol use (Brook et al., 2010). The current study also found that parental alcohol use was not a predictor of young adult alcohol use and peer alcohol use was a more significant predictor of adolescent alcohol use. This indicates that the amount of reliance individuals have on their parents declines over time.

Limitations

A limitation of this study was the use of a secondary data set. Although it was beneficial to use a nationally representative sample that provided three waves of data, variables were limited by the questions asked by the original researchers. Because of this, there were few number of items to create target variables. For example, parental alcohol use was made up of only three questions. Additionally, questions were limited to those that were asked at both time points. There was also some limitation on question selection due to the variation in measurement. While this study used measures of alcohol use reported by the parent and alcohol use themselves, it used self-report methods which can be biased (Winters, Stinchfield, Henly, & Schwartz, 1990).

Clinical Implications

Given the increased association between young adult alcohol use and peer alcohol use by adolescent alcohol use, clinical intervention should be introduced during adolescents to help reduce subsequent alcohol use. Ability to effectively manage perceived need to emulate peers which could be more explicitly utilized by clinicians when working with adolescents who use alcohol (Crosnoe & McNeely, 2008).

Because of the significant relationship between young adult alcohol use and depression, this may indicate a need to focus on depressive symptoms with young adult alcohol users. Clinical interventions focusing on self-regulated consequences would likely be beneficial for young adults who suffer from depressive symptoms. It would also likely be most beneficial to create substance use prevention programs for adolescents, which are directed towards how they perceive or interact with their neighborhoods. Additionally, community-based interventions that help create safer neighborhood environments can help support healthy adolescent development (Wilson, Syme, Boyce, Battistich, & Selvin, 2005).

Family strengthening programs may be an effective method of intervention in substance use prevention (Prado et al., 2009). Clinicians should also work with families on managing better acculturation stress and potential influences derived from the families' living environment. Interventions addressing acculturation in a family context may be beneficial to address family conflict and young adults' identification with parental values (Marsiglia et al., 2014). However, further investigation is needed to fully understand the implication of this result. Finally, gender differences in the current study are consistent with previous research (Iwamoto & Smiler, 2013), suggesting that gender-neutral interventions may be less beneficial than targeted interventions.

Research Implications

Further research on intergenerational transmission of alcohol use should be conducted with more comprehensive measurements that include responses to parent alcohol use from both parents. Considering that parent country of birth was significant in predicting young adult alcohol use, further investigation should examine the differences in being either first, second, or third generation immigrant on substance use. Studies with larger samples should be conducted to facilitate group comparisons across genders and age groups for instance middle school and high

school adolescent. Gathering information from even younger populations would be beneficial to determine the exact time when intervention would be most effective.

Conclusion

This study suggests that parents and peers have a significant association with alcohol use among Latin American adolescents in the U.S. Having peers use alcohol at an early age further predicts alcohol use in young adulthood via adolescent alcohol use. While the connection between parental and adolescent alcohol use has been well documented, literature has been unclear whether the relationship occurs as a direct relationship or as a result of other variables such as peer alcohol use (Campbell & Oei, 2010; Haller et al., 2010). This study supports Crosnoe and McNeely (2008) in their findings that adolescent alcohol use is best understood with consideration of peer relationships due to their importance in adolescent development. Because peer alcohol use was more significantly associated with adolescent alcohol use than parental alcohol use, this study supports findings from current literature which suggests that adolescent alcohol use is most likely to occur with friends in social contexts (Brooks-Russell et al., 2014).

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Appendix A - Tables and Figures

Figure 1: Path Analysis Examining Adolescent and Young Adult Alcohol Use

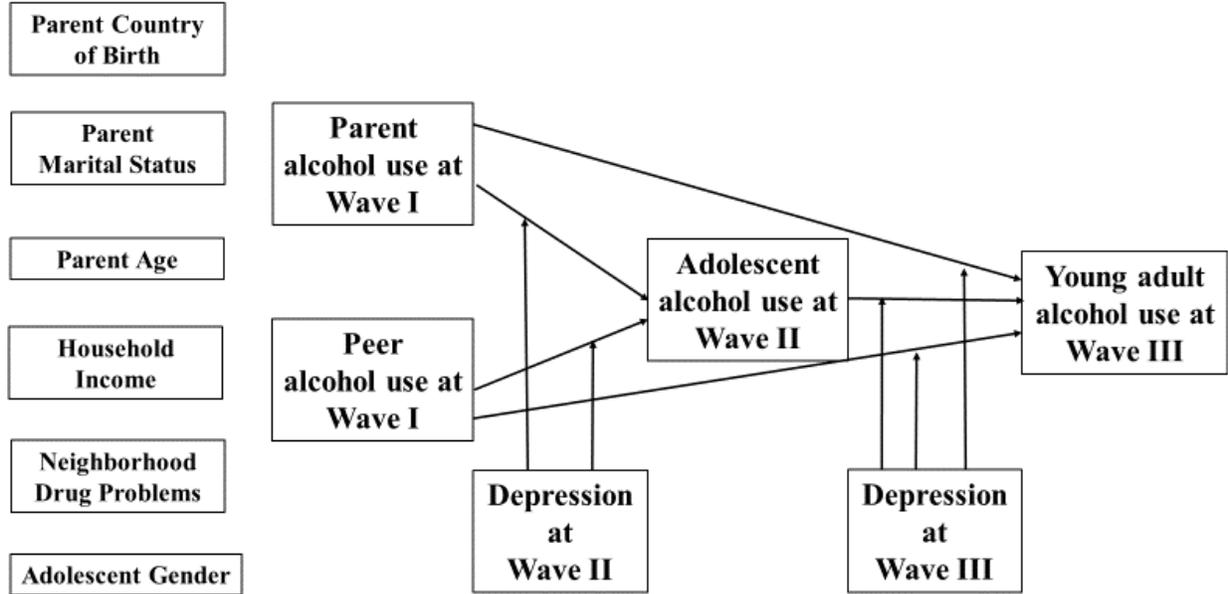


Table 1: *Descriptive Statistics of Variables (N = 400)*

	<i>M</i>	<i>SD</i>	Range	α
Parent Alc use W1	5.5	2.54	3-17	.61
Peer Alc use W1	2.07	1.13	1-4	
Adolescent Depression W2	6.18	2.33	4.00-16.00	.82
Adolescent Alc use W2	8.17	4.11	4.00-21.00	.88
YA Depression W3	5.85	2.38	4.00-16.00	.84
YA Alcohol use W3	9.24	4.14	4.00-21.00	.89
Parent Alc-Adolescent Depression	34.12	21.89	12.00-150.00	
Peer Alc-Adolescent Depression	12.93	10.10	4.00-64.00	
Parent Alc-YA Depression	32.66	20.32	12.00-160.00	
Peer Alc-YA Depression	12.60	9.64	4.00-56.00	
Adolescent Alc-YA Depression	53.83	39.76	16.00-272.00	
Adolescent Gender	1.53	0.20	1-2	
Adolescent Age W2	15.95	1.56	13-21	
YA Age W3	21.63	1.76	18-26	
Parent Gender	1.96	0.20	1-2	
Parent Age	41.10	6.56	20-70	
Parent Country of Birth	1.54	0.50	1-2	
Parent Marital Status	2.47	1.04	1-5	
Neighborhood Drug Problems	1.57	0.72	1-3	
Parent Income	34.78	30.78	0-250	

Note. W = Wave. Alc = Alcohol. YA = Young Adult. Gender: 1 = *male*, 2 = *female*.

Table 2: Correlations Among Parent, Peer, Adolescent and Young Adult Alcohol Use and Depression ($N = 400$)

	<i>M (SD)</i>	1	2	3	4	5	6
1. Parent Alcohol use W1	5.57 (2.57)	-					
2. Peer Alcohol use W1	2.08 (1.14)	-.01	-				
3. Adolescent Depression W2	6.17 (2.30)	-.01	.21**	-			
4. Adolescent Alcohol use W2	8.31 (4.22)	.20	.26**	.10	-		
5. Young Adult Depression W3	5.81 (2.34)	-.01	.09	.40**	.14	-	
6. Young Adult Alcohol use W3	9.41 (4.18)	.11	.15*	.13	.46**	.14	-

Note: * $p < .05$. ** $p < .01$. (two-tailed). W = Wave.

Table 3: *Unstandardized and Standardized Coefficients of Final Path Model*

Parameter	r^2	b	SE	β
Paths to Adolescent Alcohol W2:	.22			
- Parent alcohol W1		.33*	.20	.20*
- Peer alcohol W1		.96**	.32	.26**
- Depression W2		.15	.15	.08
- Depression W2 x Parent Alcohol W1		.01	.08	.01
- Depression W2 x Peer Alcohol W1		-.06	.11	-.04
- Adolescent Age		.15	.20	.06
- Gender		-1.40*	.72	-.16*
- Parent Country of Birth		1.00	.81	.12
- Neighborhood Drug Problems		-1.01*	.51	-.17*
Paths to Young Adult Alcohol W3:	.34			
- Parent alcohol W1		.08	.19	.05
- Peer alcohol W1		-.10	.28	-.03
- Adolescent Alcohol W2		.32***	.13	.32***
- Depression W3		.34*	.20	.19*
- Depression W3 x Parent Alcohol W1		.13	.13	.19
- Depression W3 x Peer Alcohol W1		-.03	.14	-.02
- Depression W3 x Adolescent Alcohol W2		-.07	.05	-.18
- Young Adult Age		-.11	.18	-.04
- Gender		-1.70**	.62	-.20**
- Parent Country of Birth		2.31**	.68	.28***
- Neighborhood Drug Problems		-.23	.56	-.05

Note: * $p < .05$. ** $p < .01$. *** $p < .001$