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Changes in the strength of peer influence and cultural factors on substance use initiation between late adolescence and emerging adulthood in a Hispanic sample

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Abstract

We examine whether peer substance use and cultural factors differentially influence the initiation of tobacco, alcohol and marijuana use in adolescence and emerging adulthood among a community based sample of Hispanics. Participants provided data in 11th grade (M=16.8 years old, SD = 0.54) and emerging adulthood (M=20.3 years old, SD = 0.6). Peer tobacco use had a stronger association with tobacco use initiation in emerging adulthood (OR=1.46, 95% CI = 1.13, 1.89) than in adolescence (OR=1.20, 95% CI = 1.03, 1.40), but this pattern was not observed with alcohol or marijuana use initiation. Cultural orientation is associated with tobacco use initiation during EA, but not with alcohol or marijuana use initiation.

Keywords

adolescence; emerging adulthood; peer; initiation; alcohol; tobacco; marijuana

Substance use initiation (referred to as 'initiation' here) in adolescence is one of the most robust predictors of later life stage problematic substance use, especially for tobacco, alcohol and marijuana (D'Amico & McCarthy, 2006; Stueve & O'Donnell, 2005), substances with the highest prevalence of use in the United States (U.S.). Hispanics represent an important subpopulation within the U.S. as Hispanic youth tend to initiate substance use earlier than non-Hispanic Whites (Johnston, O'Malley, Bachman, & Schulenberg, 2007) and are disproportionately affected by substance use problems (Dawson, Goldstein, Chou, Ruan, & Grant, 2008; King & Chassin, 2007; Mulia et al., 2009; Substance Abuse and Mental Health Services Administration, 2013). Moreover, earlier substance use initiation may be a significant factor influencing health disparities (Arias et al., 2003).

While several theoretical models have attempted to explain adolescent substance use behavior (see Petraitis, Flay, & Miller, 1995), the Theory of Triadic influence (TTI) developed by Flay and Petraitis (1994) guided the present study. The TTI describes three streams, or types, of influence on behavior: cultural/attitudinal (sociocultural factors), social/

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normative (immediate social environment) and biological/intrapersonal (psychological and biological factors). This theoretical model was chosen given its flexibility in that theorists expect influences from multiple streams of influence to interact and have a combined effect on behavior. Empirical studies in the substance use literature on initiation and continued substance use have identified several important factors supporting this theoretical model. We outline the theoretical and empirical evidence for the variables of interest in the present study—peer substance use and cultural orientation—below.

Research investigating the risk and protective factors for adolescent substance use initiation has produced a large body of evidence suggesting that a major risk factor for adolescent initiation is peer substance use (for review, see Donovan, 2004; Bahr, Hoffman, & Yang, 2005; Hoffman, Sussman, Unger, & Valente, 2006). The prevailing theories explaining the role peers play in substance use commonly suggest one of two reasons for this consistent finding across populations and disciplines studying substance use: peer selection effects and peer influence (Hoffman, Monge, Chou, & Valente, 2007). Peer “selection effect” is described as selecting friends who exhibit similar behavioral tendencies whereas “peer influence” suggests that social networks exert normative pressures on individuals to adopt or maintain behaviors to fit in. Regardless of the mechanism, many prevention strategies are designed to buffer against the negative influences of peers or enhance resilience and promote friendships based on prosocial activities and interests. Typically, these strategies include pscyhoeducation regarding the influence of perceived norms, bolstering refusal skill self-efficacy or understanding the personal and social consequences of substance use.

For Hispanic adolescents, distal and proximal cultural processes may also play an important role in substance use behavior during adolescence. Among distal cultural factors, the relationship between acculturation—the process of adapting and navigating the values and beliefs of a host culture—and substance use has received considerable research attention (Kulis, Marsiglia, & Nagoshi, 2012; Unger, Schwartz, Huh, Soto, & Baezconde-Garbanati, 2014). Empirical findings suggest that acculturation is not a linear process, but rather a multidimensional one, that reflects change at the individual, family and community level. Theoretical models (Berry, 1980) argue that acculturation can lead to multiple outcomes, including adoption of the host culture’s practices, values and identification (e.g., Americanism; assimilation), retention of the culture of origin (e.g., Hispanicism; separation), biculturalism (retaining one’s culture of origin while also adopting select aspects of the host culture; integration) or alienation from both cultures (marginalization).

Some studies have found that adoption of United States (U.S.) values is associated with an increased risk for substance use whereas retention of one’s culture of origin is protective (Schwartz et al., 2014) while still others suggest that retention of heritage culture is protective, but the adoption of U.S. culture does not necessarily lead to an increase in risky behavior (Tonin et al., 2008; Miller, 2011). A possible explanation for these observed relationships are differences in proximal cultural values, such as familism (or familismo)—described as subsuming one’s personal interests to the values and demands of the family. Familism has been shown to have protective effects for substance use with Hispanic samples (Castro, Stein, & Bentler, 2009; Shih, Miles, Tucker, Zhou, & D’Amico, 2012; Santisteban, Coatsworth, Briones, Kurtines, & Szapocznik, 2012).

However, these theories and empirical findings have been largely limited to studies of substance use initiation in adolescent samples. Whether use by peers has a similar impact on tobacco, alcohol and marijuana initiation in emerging adulthood (age 18-25) remains understudied, especially in Hispanic populations. In fact, the majority of the research examining peer effects in this age group tends to focus on regular, problematic or clinical levels of use (Quinn & Fromme, 2011) whereas studies on the role of peer use in predicting initiation in early adulthood are commonly restricted to samples of college students (Fielder, Carey & Carey, 2012; Pinchevsky et al., 2012; Suerken et al., 2014).

Examining the predictors of initiation in emerging adulthood is a worthwhile endeavor with important theoretical and clinical implications. First, tobacco and alcohol become legally available during this life stage thereby increasing access to these substances. While marijuana is currently illegal in many states, changing public perceptions and recent legalization of recreational use in several states has altered normative beliefs and expectations. Second, it remains unclear how some individuals are protected from, or resilient to, risk factors for normative (adolescent) initiation to substance use, but become susceptible to late (emerging adulthood) initiation. Third, little is known about the consequences of later initiation of substance use, calling for more research to understand the mechanisms that contribute to emerging adult substance use initiation and its consequences. Fourth, emerging adulthood is considered a time of identity exploration as adolescents shift into adult roles with new experiences and responsibilities (Arnett, 2000). The behaviors they engage in, and resulting life experiences, begin to define their sense of self. Substance use could meet several needs during this developmental stage; it may symbolize an “adult” behavior, serve as a coping mechanism to contend with new and unfamiliar stressors, or act as a social lubricant. Finally, it is not fully understood how proximal and distal cultural influences impact substance use initiation during emerging adulthood, especially in non-college attending and/or Hispanic samples. The overall goal of the present investigation is to examine the role of peer substance use and cultural factors on substance use initiation at two developmental stages—adolescence an emerging adulthood. Assessing the similarities and differences in factors associated with tobacco, alcohol, and marijuana use initiation at two development stages can aid in the identification of best practices for primary prevention programs tailored to Hispanic adolescent and emerging adult populations.

Current study

The present study explores whether, and to what degree, peer substance use and cultural orientation influences the initiation of tobacco, alcohol and marijuana use among a cohort of Hispanics who were followed from high school through young adulthood. We investigate the role of these factors in predicting initiation during 10^{th} grade and between 11^{th} grade and between 11^{th} grade and emerging adulthood in a Hispanic sample from Southern California. We hypothesized that 1) peer substance use would have a significant positive relationship with tobacco, alcohol and marijuana use initiation during adolescence, and a significant, but relatively weaker association with initiation in emerging adulthood, 2) higher levels of Hispanicism and familism will have an inverse relationship with substance use initiation and 3) higher levels of Americanism will have a positive relationship with substance use initiation after controlling for two theoretically meaningful covariates; gender (Brechwald

and Prinstein, 2011; Donovan, 2004; Musher-Eizenman, Hobb, & Arnett, 2003; Nolen-Hoeksema, 2004; Bransletter et al., 2012; Buu et al., 2014) and depression (Boden & Fergusson, 2011; Edwards et al., 2011; Hamilton et al., 2008; McCarty et al., 2012; Maslowsky, Schulenberg & Zucker, 2014).

Methods

Participants

Project RED (Reteniendo y Entendiendo Diversidad para Salud) is a longitudinal study of acculturation patterns and substance use among Hispanic adolescents in Southern California. Respondents were students attending seven high schools in the Los Angeles area. Schools were approached and invited to participate if 70% or more of the student body identified as Hispanic as indicated by data from the California Board of Education. School principals and/or district superintendents provided approval for the study before recruitment and data collection began.

In 2005, the study team approached 3,218 ninth-grade students in Los Angeles County to participate in the study. Of 2,222 students who agreed to participate, a total of 1,963 (88%) participants self-identified as Hispanic or Latino or reported a Latin American country of origin. Students retained in the study completed measures in the 10^{th} and 11^{th} grades in 2006 and 2007, respectively. Between the 9^{th} and 10^{th} grade surveys, one school district divided and transferred students from one of the participating schools to a new school. Therefore, we included the 10^{th} grade class from the new school in the sample as well as any new students who moved to the participating schools, resulting in an additional 704 Hispanic participants joining in 10^{th} grade. The research team was able to reestablish contact with 1,390 Hispanic participants between 2010 and 2012 and these participants represent the Year 1 cohort of emerging adults (EA year 1).

Procedure

High school assessments—Trained research assistants visited the students' classrooms, explained the study, and distributed consent forms for the students to take home for their parents to sign. If students did not return the consent form, a research assistant telephoned the parents to explain the study and request verbal parental consent. Students with written or verbal parental consent were allowed to participate. Students were independently given the opportunity to assent or decline to participate. Data collectors returned to the schools when the students were in 10^{th} and 11^{th} grade. Students who could be located in the same schools (as well as students who had transferred to another school participating in the study) completed follow-up surveys in their classrooms. Tracking procedures were used to locate the students who had transferred schools. During the 9^{th} grade survey, students provided their contact information and the contact information for two family or friends to help locate them should they move during the course of the study. School personnel also provided forwarding information if available. Data collectors telephoned the missing students in the evenings and surveyed them by telephone. A total of three waves of data collection for the original Project RED study were collected in the 9^{th}, 10^{th}, and 11^{th} grade years in 2005, 2006, and 2007, respectively. Study procedures were approved by the University of Southern

California Institutional Review Board and by the ethics committees from the school districts from which adolescents were recruited. Additional information regarding the original procedures is provided elsewhere (Unger, Ritt-Olson, Wagner, Soto, & Baezconde-Garbanati, 2007).

Emerging adult assessments—From 2010-2012, the study team attempted to re-establish contact with the Hispanic participants who had participated in any wave of the high school survey to take part in an Emerging Adulthood (EA) survey. Research assistants began by sending letters to the respondents' last known address and invited them to visit the study website or call a toll-free phone number to complete the survey. If this was not successful, the study team began to contact the participants via all information on file, including the phone numbers, email addresses, and phone numbers of parents, other relatives, and family friends. Research staff searched for them online using publicly available search engines (e.g., Google) as well as social networking sites (e.g., Facebook) when they could not be located elsewise. Participants who verified their identity and participation in the original Project RED study were invited to participate in the first emerging adult survey by phone or online. These tracking procedures resulted in 2,151 participants with valid contact information. Among this group, 1,390 (65%) were surveyed between 2010 and 2012 producing the EA year 1 cohort.

Measures

Substance use initiation—We assessed alcohol, tobacco and marijuana use initiation at two times (11^{th} grade and EA year 1). For tobacco, we used the item, "Have you ever tried cigarette smoking?" where a response of "yes" indicated use. For alcohol, we measured use using the item, "During your life, how many days have you had at least one drink?" where any response greater than zero days indicated use. Finally, we assessed marijuana use with the item, "In your lifetime, how many times have you ever used marijuana?" where any response greater than zero days indicated use.

To measure initiation during high school, we identified participants who indicated use in 11^{th} grade, but not in 9^{th} or 10^{th} grade. Participants were considered initiates during EA year 1 if they reported use at that assessment but did not report substance use on any of the high school assessments. Participants were removed prior to the statistical modeling if they initiated use in 9^{th} or 10^{th} grade or had no data on substance use at earlier waves of data collection.

Peer substance use—Peer substance use was measured by asking participants to report the number of close friends who used tobacco, alcohol and marijuana. Possible responses for each substance ranged from 0 (zero close friends use) to 5 (all five close friends use).

Depressive symptoms—The 20-item Center for Epidemiologic Studies Depression (CES-D) scale assesses depressive symptomology among non-clinical samples (Radloff, 1977). Items assess the frequency of depressive symptoms over the previous seven days (e.g., feeling sleepy, not eating well, having crying spells, etc.) with responses ranging from 0 "Less than one day or never" to 3 "5-7 days." Four positively worded items were reverse

coded before scoring. The internal consistency for the measure was good (11th grade: α = 0.87, EA year 1: α = 0.90).

Acculturation—A short version of the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) developed by Cuellar, Arnold, and Maldonado (1995) was used to assess acculturation. Items were chosen based on previous pilot testing and factor analysis. The measure includes two subscales measuring U.S. (7 items, 11th grade: α = 0.76, EA year 1: α = 0.74) and Hispanic orientation (6 items, 11th grade: α = 0.92, EA year 1: α = 0.90) that we describe as Americanism and Hispanicism, respectively. Sample items of the Americanism subscale include "My thinking is done in the English language" and "I enjoy listening to English language music." Sample items of the Hispanicism subscale include "I enjoy listening to Spanish language music" and "My thinking is done in the Spanish language." The subscales are scored such that a higher mean score indicates higher levels of Americanism or Hispanicism.

Familism—The cultural value of familism was assessed using four items from a scale that has been previously validated in a multicultural sample of adolescents (Unger et al., 2002; Unger et al. 2006). Sample items include "If one of my relatives needed a place to stay for a few months, my family would let them stay with us" and "I expect my family to help me when I need them." Responses to items were coded as 0 (definitely not) to 4 (definitely yes). Scores were summed where higher sums indicated greater levels of familism (11th grade: α = 0.81, EA year 1: α = 0.71).

Gender—Gender was coded as 'Male' = 0 and 'Female' = 1.

Analytic Plan

The final analytic samples were comprised of students and emerging adults who provided complete data on all variables of interest. Descriptive analyses were run for all predictors of interest and attrition analysis was performed to examine changes in the sample characteristics between the high school and emerging adult data collection waves. Separate logistic regression models were computed to predict the initiation of tobacco, alcohol and marijuana use in 11th grade and EA year 1 for a total of six statistical models. Using Variance Inflation Factor (O'Brien, 2007) to assess multicolinearity we found no evidence of significant colinearity in the statistical models.

To account for possible clustering effects during the 11th grade survey, multilevel models were constructed using school as a random effect. Preliminary analyses did not indicate any clustering by school ($p>0.05$), and the interclass correlation (ICC) estimates for tobacco (ICC=0.000), alcohol (ICC=0.000) and marijuana use (ICC=0.000) were negligible suggesting that clustering effects did not influence the estimation of variance for the statistical models. The reference group for all analyses was never-users. For the EA analysis, individuals who initiated in adolescence were not included in the reference group. The full results are reported as odds ratios (OR) with 95% confidence intervals (95% CI). Associations were considered significant when $p<0.05$. All analyses were performed in Stata version 12 (Stata Corp, 2011).

Results

Descriptive statistics and Attrition Analysis

Table 1 presents descriptive statistics for individuals who had not initiated use by 11th grade (n=1,235) or EA year 1 (n=685). The average age of the analytic sample at the 11th grade survey was 16.78 years (SD = 0.42), and the average age at the EA year 1 survey was 20.34 years (SD = 0.64). In EA year 1, 58.1% of participants reported that they had some postsecondary education. One hundred twenty three (9.9%) participants in the analytic sample initiated tobacco use, 144 (11.7%) initiated alcohol use and 129 (10.5%) initiated marijuana use between the 10th and 11th grade assessments. On the EA year 1 survey (n=685), 303 (44.2%) additional participants had initiated tobacco use, 145 (21.2%) initiated alcohol use and 477 (69.6%) initiated marijuana use.

For the entire Project RED sample, participants lost to follow-up were more likely to be male, binge drinkers and marijuana users in high school. Because one goal of this study focused on initiation among never-users in high school, we re-ran the attrition analysis with participants who abstained from tobacco, alcohol and marijuana during high school. Our results indicate that, among abstainers in high school, those lost to follow up were more likely to be male and report higher scores on the CES-D measure in 11th grade (p's <0.05). There were no significant differences due to age, familism or acculturation level.

Tobacco use initiation

Adolescence—As seen in table 2a, results from the final model suggest that the number of peers using tobacco products was the strongest predictor of initiating tobacco use before the 11th grade survey (OR = 1.20, 95% CI = 1.03, 1.40), but the odds of initiating tobacco use did not increase as the number of friends who reported alcohol or marijuana use increased. The odds of initiating tobacco use were significantly lower for females relative to males during 11th grade (OR = 0.64, 95% CI = 0.43, 0.95).

Emerging adulthood—A total of 303 participants initiated tobacco use between 11th grade and the first EA survey, when participants were, on average, 20.3 years old (SD = 0.6). Table 2b presents results from the final model showing that that peer tobacco use (OR = 1.46, 95% CI = 1.13, 1.89) and peer alcohol use (OR = 1.27, 95% CI = 1.01, 1.60) were related to an increase in the odds of tobacco use initiation, but peer marijuana use was not. As in adolescence, females were less likely to initiate tobacco use relative to males (OR = 0.53, 95% CI = 0.38, 0.76). The final model also suggests that cultural variables predict tobacco use initiation in EA. Specifically, the odds of initiating tobacco use increased with level of Americanism (OR = 1.40, 95% CI = 1.01, 1.95) and decreased as the level of Hispanicism increased (OR = 0.78, 95% CI = 0.66, 0.94), we found no association between tobacco use initiation and familism.

Alcohol use initiation

Adolescence—Results from the final statistical model (Table 3a) suggest that none of the hypothesized predictors were associated with initiation of alcohol use in 11th grade.

Emerging adulthood—Between the final high school survey and the first EA survey, a total of 145 participants initiated alcohol use. The only significant relationship was the lower odds of alcohol initiation for females relative to males (OR = 0.62, 95% CI = 0.42, 0.92).

Marijuana use initiation

Adolescence—Results from the final statistical model assessing adolescent initiation (Table 4a) indicate that the odds of initiating marijuana use before the 11th grade survey increased with a higher number of friends using alcohol (OR = 1.38, 95% CI = 1.19, 1.60) and marijuana (OR = 1.17, 95% CI = 1.03, 1.34). While we did not observe an improvement from the baseline model when cultural variables were introduced in the second step ($p = 0.20$), there was a statistically significant improvement when peer substance use variables were introduced in the final step ($p<0.0001$).

Emerging adulthood—A total of 477 participants reported marijuana use initiation between the 11th grade survey and the first EA survey. As seen in Table 4b, there were no statistically significant relationships between the hypothesized predictors and marijuana use initiation.

Discussion

This is the first study to investigate the variation in the predictive utility of peer substance use and cultural variables on tobacco, alcohol and marijuana use initiation during adolescence and emerging adulthood in a Hispanic sample. These findings present some important differences that vary by developmental stage and substance used.

Consistent with our hypotheses, tobacco use initiation in adolescence was strongly related to peer tobacco use. This finding supports previous research documenting the impact of peer use on smoking initiation among adolescents (Hoffman et al., 2006). Peer alcohol use, as well as peer tobacco use, was also positively associated with tobacco initiation at this time point—an association that is theoretically and empirically consistent with prior work demonstrating health behaviors, and in particular substance use behavior, tend to cluster together (Donovan & Jessor, 1985).

Cultural orientation significantly predicted tobacco use initiation. Specifically, having an U.S. orientation was associated with an increase in the odds of initiation, whereas having a Hispanic orientation was associated with a decrease in the odds of initiation. This finding, that the relationship between cultural orientation and health behavior outcomes favors those who retain their heritage cultural identity, is supported by the Hispanic paradox (Franzini, Ribble, & Keddi, 2000; adoption of American (U.S.) values associated with an increase in negative health behaviors). However, why this was observed during EA but not in adolescence is an interesting departure from prior studies. A likely explanation is that cultural identity is still evolving during adolescence (Phinney & Ong, 2007) and that peer norms still exert a stronger influence on substance use behaviors than distal cultural beliefs at this stage. However, the more defined sense of self that emerges in adulthood may decrease susceptibility to peer influences on substance use behaviors and becomes an

important protective factor over the life course. This shift in influence warrants further investigation as it may provide useful information that can inform future prevention work.

In contrast to previous findings (Donovan, 2004; Mundt, 2011) and our hypotheses, peer alcohol use was not associated with alcohol use initiation in adolescence or EA. A possible explanation for this finding is that peer use may have led to earlier initiation of alcohol use in this sample, and those who abstained until the 11th grade survey remained insensitive to the effect of peer use. We also did not observe any significant relationships between cultural values and alcohol use initiation at either life stage. The only significant association observed in the present study was a decrease in the odds of initiating alcohol use in EA for females relative to males. These findings suggest that mechanisms not considered in the present study are responsible for alcohol use initiation during adolescence and EA. Previous work has documented that early alcohol use initiation may be related to anxiety, alcohol expectancies, and specific family level variables such as parental communication, involvement, and family structure (Segura, Page, Neighbors, Nichols-Anderson, & Gillapsy, 2004). Moreover, while alcohol use initiation during adolescence is a noted risk behavior, using alcohol during emerging and young adulthood is considered a normative behavior. The factors related to alcohol use initiation in EA are probably different and related to other developmental and social/contextual processes. Future research attempting to identify common risk and protective factors for substance use initiation during adolescence and emerging adulthood using different hypothesized predictors may reveal important results that can help us to understand what drives alcohol use initiation among emerging adults, and aid in developing efficacious prevention programs useful at this developmental stage.

During adolescence, peer alcohol and marijuana use was positively associated with the odds of initiating marijuana during adolescence but not during EA. These findings continue to support the idea that specific health-risk behaviors may cluster together (Donovan & Jessor, 1985). There was no evidence of gender differences or changes in the odds of marijuana use initiation during 11th grade or EA as a function of cultural factors or peer substance use. As with alcohol use initiation, during EA specifically, there may be other important developmental and sociocultural factors that were overlooked in the present study that explain this behavior.

Overall, our findings provided mixed support for our hypotheses. In addition, these findings differ somewhat from previous work examining substance use initiation in the emerging adult age group. For example, Bernat and colleagues (2012) reported that initiation of tobacco use for a community-based sample of 18-21 years olds was associated with being male and having friends who smoke, among other covariates. Of course, the majority of the sample was enrolled in a college/university (77.7%) whereas only 58.1% of the sample retained for the EA year 1 assessment reported any postsecondary education. Peer networks of non-college attending emerging adults differ from those of college students in terms of density, life experience, and exposure and should be explored empirically in relation to substance use behavior. Furthermore, those who do not attend college might continue to live and work in the neighborhoods they grew up in and continue to be influenced by their high school peers on a similar life course trajectory.

Perhaps most notably, there were several instances where initiation of a particular substance was related to peer use of another substance. It is possible, for example, that a participant was using the same substance as their peers (e.g., marijuana), but only recently began to experiment with another (e.g., alcohol). These participants would not have been removed from the analysis and it would appear that associating with peers using one substance leads to initiation of another. This is important to consider when designing prevention messages or programs that target members of either age group. Also, while several of the variables in this analysis have been previously associated with substance use in emerging adulthood for our cohort (Unger, 2014; Grigsby et al., 2014), we did not observe a similar pattern of findings. This discrepancy suggests that predictors of late substance use initiation differ from predictors of recent use among those who have already initiated use earlier in adolescence. Prevention scientists should consider this in the development of primary interventions for emerging adults.

More work focusing on identity development and substance use with emerging adults may provide some insight into those who continue to explore their sense of self and how this relates to negative health behaviors. Alternatively, stressors that result from transitioning into adulthood may be a possible explanatory variable and initiating substance use may be a means of coping with new challenges and responsibilities experienced during this life stage (Allem, Lisha, Soto, Baezconde-Garbanati, & Unger, 2013). It is also conceivable that less parental and school supervision exacerbates substance use for individuals who have not developed sufficient refusal skills such that the increase in access and exposure to substances increases risk of experimentation or regular use. These are important areas for future research as emerging adult populations continue to be vulnerable to the deleterious neurological and psychological effects of substances than adults in their late twenties or beyond.

Limitations and conclusions

The reader should interpret the findings of this analysis with the following limitations in mind. First, the conclusions we report are based on cross-sectional relationships. Therefore, no cause and effect conclusions can be made. Second, we utilized survey data for the present analysis and are not able to distinguish whether peer selection or peer influence was responsible for the significant associations between peer use and initiation in adolescence or emerging adulthood. Moreover, while survey data can produce reliable estimates, there is a possibility that responses were inaccurate for participants who did not want to be identified as “users” or for other socially desirable reasons. Third, this cohort of Hispanics is not representative of the general population and replication with larger, community-based samples is recommended. Fourth, there was a considerable gap in measurement time between 11th grade and emerging adulthood and the true time of initiation cannot be determined. However, to be considered an initiator in emerging adulthood, participants could not have reported use of a substance at any time point in high school so we are confident that we were capturing initiators sometime after the 11th grade. Finally, our sample sizes changed between the analyses and this impacted our power to detect statistically significant effects. Multiple imputation was not feasible to handle missing data as data were likely not “missing

at random." The attrition analyses indicated that those lost to follow-up were more likely to report substance use in high school.

In summary, we found that the predictive utility of peer substance use on tobacco, alcohol and marijuana initiation varied across the two developmental life stages; adolescence and emerging adulthood. A concerted effort to understand what factors are the most relevant in predicting, and preventing, substance use initiation in Hispanic emerging adult populations is needed to improve substance use education, care and service delivery. Moreover, it is also important that researchers understand that emerging adults that have not used tobacco in adolescence are sensitive to cultural influences and peer substance use. A promising area for future work will be to determine how these influences could be leveraged in prevention and intervention programs. We propose a few possible explanations worthy of further exploration.

First, we observed that tobacco use initiation was lower for females relative to males a finding that may have important implications for prevention work and should be further explored in models using peer influence predictors. Second,, it is very likely that social network structures and peers have changed between adolescence and emerging adulthood and become more diverse or lack consistency in exposure. Extending previous empirical work of this transition and its relation to substance use and other health behaviors (Phua, 2011; Mason, Zaharakis, & Benotech, 2014) could reveal some important information that will be useful for prevention programming during this period of transition. Second, emerging adults have considerably more life experience that will influence their behavioral choice as they face new experiences as independent adults. Previous work with this cohort has already shown that a select number of these experiences influence some substance use behaviors (Allem, Soto, Baezconde-Garbanati, & Unger, 2013; Allem, Lisha, Soto, Baezconde-Garbanati, & Unger, 2013). Finally, more research is recommended to investigate the long-term impact of later substance use initiation. While substance us initiation in adolescence has been well studied, less is known about the escalation of substance use and development of substance use disorders among individuals who initiate substance use after the adolescent developmental period.

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Table 1

Descriptive statistics for demographics and variables of interest for analytic samples in (a) adolescence (11th grade) and (b) emerging adulthood (EA year 1)

	(a) 11th grade n = 1,235		(b) Emerging adulthood n = 685	
Variable	**M**	**SD**	**M**	**SD**
Age	16.78	0.42	20.34	0.64
Friends that smoke	1.36	1.57	1.72	0.73
Friends that drink	1.63	1.67	3.00	0.94
Friends that use marijuana	2.10	1.79	1.87	1.05
CES-D score	18.29	8.77	13.39	9.69
Americanism	3.92	0.59	4.06	0.51
Hispanicism	3.31	0.98	3.37	0.94
Familism	13.31	2.50	13.74	2.13
	f	%	f	%
Female	691	55.9%	437	63.8%
Initiation of tobacco	123	9.9%	303	44.2%
Initiation of alcohol	144	11.7%	145	21.2%
Initiation of marijuana	129	10.5%	477	69.6%

Note: M = mean, SD = standard deviation, f = frequency, % = percent, CES-D = Center for Epidemiological Studies-Depression scale.

Table 2

Multivariate logistic regression results presenting odds ratios (ORs) and 95% confidence intervals (95% CI) for tobacco use initiation in (a) adolescence (11th grade) and (b) emerging adulthood

	(a) Adolescence (11th grade)		(b) Emerging adulthood	
Predictors	**OR**	**95% CI**	**OR**	**95% CI**
Americanism	0.88	0.64, 1.23	**1.40**	**1.01, 1.95**
Hispanicism	0.86	0.71, 1.05	**0.78**	**0.66, 0.94**
Familism	1.00	0.93, 1.08	0.94	0.87, 1.02
Peer tobacco use	**1.20**	**1.03, 1.40**	**1.46**	**1.13, 1.89**
Peer alcohol use	0.94	0.81, 1.10	**1.42**	**1.16, 1.73**
Peer marijuana use	1.12	0.98, 1.28	1.15	0.97, 1.37
Female	**0.64**	**0.43, 0.95**	**0.53**	**0.38, 0.76**
Depressive symptomology	0.99	0.97, 1.02	**1.02**	**1.00, 1.04**

Note: All predictors and covariates were assessed cross-sectionally and there were 123 and 303 new self-reported initiators in adolescence and emerging adulthood, respectively. Significant findings ($p<0.05$) are in bold.

Table 3

Multivariate logistic regression results presenting odds ratios (ORs) and 95% confidence intervals (95% CI) for alcohol use initiation in (a) adolescence (11th grade) and (b) emerging adulthood

	(a) Adolescence (11th grade)		(b) Emerging adulthood	
Predictors	**OR**	**95% CI**	**OR**	**95% CI**
Americanism	0.90	0.67, 1.21	0.99	0.63, 1.48
Hispanicism	1.06	0.88, 1.27	1.07	0.87, 1.32
Familism	0.95	0.89, 1.02	1.04	0.95, 1.14
Peer tobacco use	0.98	0.84, 1.14	0.81	0.60, 1.09
Peer alcohol use	1.05	0.90, 1.21	1.07	0.85, 1.34
Peer marijuana use	0.95	0.84, 1.07	1.05	0.86, 1.29
Female	0.95	0.66, 1.37	**0.62**	**0.42, 0.92**
Depressive symptomology	0.99	0.97, 1.01	1.01	0.99, 1.03

Note: All predictors and covariates were assessed cross-sectionally and there were 144 and 145 new self-reported initiators in adolescence and emerging adulthood, respectively. Significant findings ($p<0.05$) are in bold.

Table 4

Multivariate logistic regression results presenting odds ratios (ORs) and 95% confidence intervals (95% CI) for marijuana use initiation in (a) adolescence (11th grade) and (b) emerging adulthood

	(a) Adolescence (11th grade)		(b) Emerging adulthood	
Predictors	**OR**	**95% CI**	**OR**	**95% CI**
Americanism	1.03	0.74, 1.45	1.06	0.77, 1.48
Hispanicism	0.94	0.78, 1.14	1.06	0.88, 1.27
Familism	1.07	0.98, 1.16	0.96	0.88, 1.04
Peer tobacco use	0.92	0.80, 1.06	0.93	0.72, 1.21
Peer alcohol use	**1.38**	**1.19, 1.60**	0.98	0.80, 1.14
Peer marijuana use	**1.17**	**1.03, 1.34**	0.96	0.80, 1.13
Female	0.86	0.58, 1.27	0.77	0.54, 1.11
Depressive symptomology	0.98	0.96, 1.01	1.01	0.99, 1.03

Note: All predictors and covariates were assessed cross-sectionally and there were 129 and 477 new self-reported initiators in adolescence and emerging adulthood, respectively. Significant findings ($p<0.05$) are in bold.