Published in final edited form as:

J Psychopathol Behav Assess. 2014 December 1; 36(4): 653–662. doi:10.1007/s10862-014-9426-1.

Hope as a Moderator of the Associations between Common Risk Factors and Frequency of Substance Use among Latino Adolescents

Paula J. Fite¹, Joy Gabrielli¹, John L. Cooley¹, Sarah Haas², Andrew Frazer¹, Sonia L. Rubens¹, and Michelle Johnson-Motoyama³

¹Clinical Child Psychology Program, University of Kansas

²State University of New York at Buffalo

³School of Social Welfare, University of Kansas

Abstract

Ample research suggests that delinquency, depressive symptoms, and peer substance use are common risk factors associated with adolescent substance use. However, the factors that may help to buffer the deleterious effects of these risk factors on adolescent substance use, such as hope, have yet to be examined. The current study evaluated hope as a moderator of the associations between these common risk factors and frequency of substance use (alcohol, tobacco, and marijuana) in a sample of Latino high school students ($M_{age} = 16.14$ years, $SD = 1.30$; 55% female). Findings indicated that the influence of delinquency on frequency of tobacco and marijuana use depended on levels of hope, with delinquency only positively associated with frequency of use when levels of hope were low. Additionally, hope moderated the association between depressive symptoms and alcohol use, such that depressive symptoms were only positively associated with frequency of alcohol use when levels of hope were low. Results and their implications for intervention are reviewed.

Keywords

Adolescent Substance Use; Hope; Depressive Symptoms; Delinquency; Peer Use

Substance use among youth in the U.S. is a major public health concern, as it is associated with a variety of negative outcomes, including physical health problems (Toumbourou et al., 2007; Levy, Sherritt, Gabrielli, Shrier, & Knight, 2009), school difficulties (Fergusson, Horwood, & Beauvais, 2003; Henry & Thornberry, 2010), and mental health difficulties (Patton et al., 2002; Wolitzky-Taylor, Bobova, Zinbarg, Mineka, & Craske, 2012). Given the prevalence of adolescent substance use, with nearly half of high school seniors reporting substance use within the past 30 days (e.g., Eaton et al., 2012; Johnston, O'Malley, Bachman, & Schulenberg, 2013), identification of risk factors for adolescent substance use is important for the development and refinement of adolescent substance use prevention and intervention efforts. Delinquency, peer substance use, and depressive symptoms are among the strongest known proximal predictors of adolescent substance use (e.g., Eklund & Klinteberg, 2009; Fergusson, Goodwin, & Horwood, 2003; Simons-Morton, 2007),

suggesting that these factors need to be targeted for the prevention and intervention of substance use. However, it is not yet clear under what circumstances these risk factors are most strongly associated with adolescent substance use, which can inform the development of more cost-effective, targeted substance use prevention and intervention programs. Some evidence suggests that hope, or goal-directed thinking, is negatively associated with substance use (e.g., Wilson, Syme, Boyce, Battistich, & Selvin, 2005), and additional findings indicate that hope can moderate or buffer the associations between risk factors and subsequent negative outcomes (e.g., Valle, Huebner, & Suldo, 2006). Thus, it may be that hope can buffer the associations between delinquency, depressive symptoms, and peer substance use and adolescent substance use. Accordingly, the current study evaluated the influence of hope on the associations between common risk factors and frequency of past 30 day substance use in a sample of Latino high school students.

Delinquency, Peer Substance Use, and Depressive Symptoms as Risk Factors

Delinquent behavior (e.g., skipping school, stealing, property damage) is robustly associated with adolescent substance use (e.g., Loeber, Southamer-Loeber, & White, 1999). Consistent with problem behavior theory (Jessor, 1992; Jessor & Jessor, 1977), which suggests that if an individual is willing/able to engage in one type of problem behavior then they are at increased risk for engaging in other problem behaviors, delinquency is associated with early initiation and increased frequency of alcohol (Donovan, 2004; Eklund & af Klinteberg, 2009), tobacco (Clarke, Eyles, & Evans, 1971; Kandel, Kiros, Schaffran, & Hu, 2004), and marijuana use (Fergusson, Lynskey, & Horwood, 1996; Brook, Balka, & Whiteman, 1999).

Similarly, peer influence has also been considered a central component in adolescent substance use models, above and beyond the influence of one's delinquent behavior (e.g., Hawkins & Weis, 1985; Oetting & Beauvais, 1986). In fact, some researchers argue that peer factors may be the most important predictor of adolescent substance use (e.g., Wills & Cleary, 1999), not surprisingly given that peer influences become increasingly salient during adolescence (Steinberg et al., 1992). There is ample evidence to suggest that peers can influence the initiation and exacerbation of problem behavior through modeling and reinforcement mechanisms (i.e., socialization processes; Deater-Deckard, 2001; Dishion, Capaldi, and Yoerger, 1999; Farrington, 1995; Fergusson, Swain-Campbell, & Horwood, 2002), and indeed, peer substance use has been shown to be a strong predictor of adolescents' use of alcohol, tobacco, and marijuana (e.g., Aloise-Young, Graham, & Hansen, 1994; D'Amico & McCarthy, 2006; Garnier & Stein, 2002; Kandel, 1985; Kandel, Kessler, & Margulies, 1978; Simons-Morton, 2007).

Moreover, there is substantial evidence suggesting that depressive symptoms are also associated with increased risk of youth substance use and use related problems (e.g., Audrain-McGovern, Rodriguez, & Kassel, 2009; Chan, Dennis & Funk, 2008; Fergusson, Goodwin, & Horwood, 2003; King, Iacono, & McGue, 2004; McKenzie, Jorm, Romajuk, Olsson, & Patton, 2011; McKenzie, Olsson, Jorm, Romajuk, & Patton, 2010; McKown et al., 2013; Rhode, Lewinson, & Seeley, 1996), which is likely due to the use of substances

for self-medicating and coping purposes (Buckner et al., 2008; Hussong, Gould, & Hersh, 2008; McKown et al., 2013).

Note, however, that findings regarding depression as a risk factor for adolescent substance use have been mixed, with a few studies reporting no predictive association between depressive symptoms and use of specific substances (Goodman & Capitman, 2000; Wu et al., 2008). Given the varied findings in the literature, it has been posited that perhaps more complex pathways, such as indirect and moderating effects, may be involved in the association between depressive symptoms and substance use (e.g., Kassel, Stroud, & Paronis, 2003). Thus, further research examining factors that contribute to the association between depressive symptoms and adolescent substance use behavior is warranted.

The Influence of Hope

Evidence suggests that that hopeful, goal-directed thinking may buffer adolescents' risk for substance use. According to Snyder's theory (1994; 2002), hope refers to a cognitive process, comprised of pathways and agency thinking, through which individuals actively pursue their goals. Whereas pathways thinking refers to the capacity to develop specific strategies or routes to reach a goal, agency thinking reflects the motivation needed to initiate and sustain movement towards one's goals.

Hope is a dispositional trait reflecting relatively enduring, cross-situational appraisals of one's goal-related capacities. Important distinctions should be made between this theory of hope and the related constructs of optimism and hopelessness. Whereas optimism refers to the general expectation that good things will happen (Carver & Scheier, 2002), positive expectations in hope theory are specific to goals and one's ability to attain or move towards these goals (Snyder, 2002). Conversely, hopelessness generally refers to one's negative expectations about the future (Beck et al., 1974; Kazdin et al., 1986), coupled with an expectation of one's helplessness in enacting change (Abramson et al., 1989). While related, the absence of hopeful, goal-directed thinking and the experience of hopelessness remain distinct constructs, and the absence or presence of one does not inherently signify the other.

Past research indicates that individuals with high levels of hope tend to generate many life goals, are more confident in their ability to meet challenges that arise, and tend to focus on success rather than failure when pursuing goals (Snyder, 2002). Further, those with high levels of hope are more likely to identify and engage in adaptive coping strategies when faced with stressors (Lewis & Kliewer, 1996). Roesch, Duangado, Vaughn, Aldridge, & Villodas; 2010). For example, one study of minority adolescents found that higher levels of pathways and agency thinking were positively related to the use of coping strategies such as direct problem solving, planning, positive thinking, religious coping, distraction coping, and advice seeking. Hopeful thinking has been shown to predict adaptive functioning among children and adolescents, including higher levels of academic achievement, self-esteem, and life satisfaction, lower levels of internalizing and externalizing symptoms, and better social adjustment with family and friends (Cedeno, Elias, Kelly, & Chu, 2010; Ciarrochi, Heaven, & Davies, 2007; Kwon, 2002; Lewis & Kliewer, 1996; Snyder et al., 1997; Wong & Lim, 2009). Of particular relevance to the current study, hopeful thinking has been negatively

linked to alcohol, tobacco, and marijuana use among adolescents (Carvajal, Clair, Nash, & Evans, 1998; Wilson, Syme, Boyce, Battistich, & Selvin, 2005). Moreover, Carvajal and colleagues (1998) found that high levels of hope were positively related to adolescents' intentions of avoiding future substance use.

Several investigations also suggest that hope may function as a protective factor in the face of stressful life events (e.g., Visser, Loess, Jeglic, & Hirsch, 2013). For example, Cedenio and colleagues (2010) demonstrated that hope mitigated the effects of school violence on adolescents' self-concept. Results from a study of elementary-age children of incarcerated mothers revealed that high levels of hope predicted fewer internalizing and externalizing problems after controlling for social support and stress (Hagen, Myers, & Mackintosh, 2005). Another longitudinal study of middle- and high-school students found that hope moderated the association between negative life events and adjustment (Valle, Huebner, & Suldo, 2006). Given that hope is a decision making process that results in individuals making better choices (Snyder, 2002) and has been found to mitigate the effects of known risk factors on negative outcomes, the presence of hope may help individual sat-risk for engaging in substance use. Accordingly, hope was expected to buffer the effects of depressive symptoms, delinquency, and peer substance use on adolescent substance use.

Current Study

The current study extends the adolescent substance use literature by evaluating hope as a moderator of the associations between common risk factors (depressive symptoms, peer substance use, and delinquency) and frequency of substance use (alcohol, tobacco, and marijuana) in a sample of Latino inner city high school students, a group of youth at-risk for adolescent substance use (Johnston et al., 2013). High levels of depressive symptoms, peer substance use, and delinquency were expected to be associated with elevated frequency of tobacco, alcohol, and marijuana use. However, these associations were expected to be weaker when levels of hope were high compared to when levels of hope were low.

METHODS

Participants

Participants were Latino adolescents attending a charter high school in a large, Midwestern city. Recruitment took place at the high school during parent-teacher conferences. Researchers sitting at a table in the school's main hallway provided information to parents and caregivers attending conferences. Those who were interested in enrolling their youth in the study provided written informed consent. Students who were 18 years old or older were allowed to provide their own written consent to participate in the study. Consent forms were available in both Spanish and English, as Spanish was the primary language for the majority of parents and caregivers at the school. School-sanctioned translators also assisted in providing information about the study and consent documents to parents. Parents and caregivers not attending conferences were sent consent forms through the school, which were then returned to the school and later given to the research team.

Approximately three-fourths ($n=153$) of the students enrolled in the school received written consent to participate in the current study, with 146 parents providing consent and seven students providing their own consent. Of the returned written consent forms, over two-thirds (70.6%) were the Spanish version. One-hundred forty-eight of the 153 students with consent to participate actually completed the survey; four students were absent that day and one chose not to participate. The current study focused on a subset of 141 students who identified as Latino. The sample was comprised of approximately 55% females with an age range of 14–20 years ($M = 16.14$, $SD = 1.30$). Grade level distribution of students was as follows: grade 9 (28%), grade 10 (28%), grade 11 (26%), and grade 12 (18%). School reports show that 95.4% of students enrolled at the school qualified for free or reduced-price lunch, suggesting that this sample was primarily of low socioeconomic status.

Measures

Demographics—Gender and grade level information was provided by the school. Participants were asked to respond to a range of demographic questions, including their age and race/ethnicity [i.e., Hispanic/Latino, African American (Black), Caucasian (White), Native American, Asian, Mixed, or Other].

Hope—Hope was assessed using the Children's Hope Scale (Snyder et al., 1997), a self-reported measure consisting of six statements. Students responded using a six-point Likert scale (i.e., “1 = *None of the time*” to “6 = *All of the time*”). The six statements reflect two components of the hope construct: agency (e.g., “I am doing just as well as other kids my age”) and pathways (e.g., “When I have a problem, I can come up with lots of ways to solve it”). An overall hope score was obtained by averaging the six responses, with higher scores indicating greater levels of hope. Internal consistency of this measure was good ($\alpha = .90$).

Depressive Symptoms—Depressive symptoms were measured using the Affective Symptoms DSM-Oriented Scale of the Youth Self Report (Achenbach & Rescorla, 2001). The scale typically consists of 13 self-report items concerning both cognitive and physiological components of affectivity. For the current study, two items pertaining to suicide and self-harm were not administered due to lack of proper follow-up ability and IRB concerns. Thus, for the current study, the eleven items were administered. Students responded using a three-point Likert scale (“0 = *Not true*”; “1 = *Somewhat or Sometimes True*”; “2 = *Very or Often True*”). An average score of the eleven items was computed and used for analyses, with higher scores indicating greater levels of depressive symptoms. Internal consistency of the scale was good ($\alpha = .86$).

Peer Substance Use—Peer substance use was assessed using the Perceived Behavioral Norms Questionnaire, a six-item scale of peer delinquency developed at the University of Kentucky and used in previous research (see Fite et al., 2008). Three items pertain to peer shoplifting/stealing, vandalizing, and physically attacking others and 3 items assess peer substance use. The current study focused on the three items that assessed peer substance use. Specifically, participants responded to the following items: 1) “About how many of your friends smoke cigarettes?”; 2) “About how many of your friends get drunk at least once a week?”; and, 3) “About how many of your friends smoke marijuana?” by indicating the

number of peers they believe engage in these activities using a 5-point scale (“0 = None”; “1 = 1 or 2”; “2 = Some”; “3 = Most”; “4 = All”). For analysis, items were averaged to create a composite score, with higher scores indicating greater peer substance use. Internal consistency of this measure was good ($\alpha = .82$).

Engagement in Delinquency—Fourteen self-reported items were administered to assess adolescents’ engagement in delinquency (Fergusson, Woodward, & Horwood, 1999). Participants were asked whether they had engaged in a variety of deviant or antisocial behaviors (e.g., “Purposefully set fire to a building, a car, or other property, or tried to do so?”; “Attacked someone with the idea of seriously hurting or killing them?”; “Skipped school without parents’ permission”) within the past year, and responded either yes or no (“0 = No”; “1 = Yes”). Four of the items in the measure assessed substance use and therefore were excluded from the current study to eliminate item overlap with the substance use outcomes. A sum of the 10 remaining items was computed and used for analyses, with higher scores indicating greater engagement in delinquency. Internal consistencies were not calculated due to dichotomous response options (Cohen et al., 2003).

Substance Use—Participants responded to three items from the Center for Substance Abuse Prevention (CSAP) Student Survey, adapted from the California Student Survey (Pentz et al., 1989). In the current study, three items were used to assess frequency of tobacco, alcohol, and marijuana use (i.e., “On how many days in the last month (30 days) did you smoke a cigarette?”; “On how many days in the last month (30 days) did you have an alcoholic drink?”; “On how many days in the last month (30 days) did you use marijuana?”). Items included clarification details, such as how to calculate the number of days of use (e.g., “For example, if you smoked a cigarette each weekend night that would be 8 days”) and examples of what constitutes use (e.g., “By a drink we mean a can of beer, a glass of wine, a wine cooler, or a shot of hard liquor”). Respondents wrote in the appropriate number of days for each item.

Procedures

All study procedures were approved by the researchers’ institutional review board and school administrators. Researchers administered the survey during a writing class required by all students at the school. The size of classes ranged from 5–20 students. Verbal assent was obtained from each participant prior to completion of the survey. In each class, one trained research team member read each item aloud to the students. Students individually filled out the surveys, with most completing the survey in approximately 30 minutes. Prior to data collection, researchers were provided with the names of students who might have difficulty with the English version of the survey. These students were given the option of completing the survey in Spanish. All but six students opted to take the English version of the survey ($n=142$). To ensure participants’ comfort in completing the survey and increase accuracy in reporting, school personnel were not present in all but one classroom during data collection. Note, however, that no differences in rates of responding were found when comparing the classroom in which the teacher was present to other classrooms ($p > .16$). All participants were compensated with \$5.00 for their participation.

DATA ANALYSIS PLAN

Descriptive statistics (i.e., frequencies, means, standard deviations, and correlations) were first computed to evaluate study variables and establish bivariate associations. Unique associations between the common risk factors and frequency of substance use and hope as a potential moderator were then evaluated within a structural equation model framework by estimating path models using Mplus statistical software (Muthen & Muthen, 1998–2011). Estimating path models allows for multiple outcomes to be examined simultaneously and allows for direct comparisons across outcomes to be made (Kline, 2010).

A hierarchical approach was used to evaluate associations. A first order effects model, whereby frequency of tobacco, alcohol, and marijuana use were regressed on depressive symptoms, delinquency, peer substance use, and hope was first estimated in order to evaluate unique effects. A second model, in which the interaction terms between the common risk factors and hope were added, was estimated in order to determine if hope moderated associations. Note that gender and age were included as covariates in all models, as age and gender differences in substance use are evident (Johnston et al., 2013).

Due to the substance use outcomes being positively skewed (skewness values ranging from 4.10 to 6.04), maximum likelihood robust estimation was used to accommodate the non-normally distributed data. More specifically, full information maximum likelihood robust estimation (FIMLRE) was employed to accommodate missing data (<10%). FIMLRE has been found to be less biased and more efficient than other strategies used to accommodate missing data (Arbuckle, 1996). Both models were fully saturated (0 degrees of freedom) resulting in a perfect fit to the data (Kline, 2010). Therefore model fit statistics are not reported.

All variables were standardized prior to analyses in order to aid in the interpretation of the interaction effects. Significant interactions were probed at high (+1 *SD*) and low (−1 *SD*) levels of hope in order to evaluate the interaction effect, according to standard procedures (Aiken & West, 1991).

Standardized path coefficients can be interpreted as r-values (Durlak 2009), with r-values around .10 considered small effects, r-values around .30 considered medium effects, and r-values .50 or greater considered large effects (Cohen, 1988).

RESULTS

Descriptive Analyses

Approximately 15.2% of students had used tobacco, 38.5% had used alcohol, and 22.6% had used marijuana in the past 30 days. These rates are consistent with the rates reported in a nationally representative sample of 10th and 12th graders (Tobacco use: 10th graders 10.8% and 12th graders 17.1%; Alcohol use: 10th graders 27.6% and 12th graders 41.5%; Marijuana use: 10th graders 17.0% and 12th graders 22.9%; Johnston et al, 2013). Rates of frequency were also similar (e.g., % of those who used alcohol at least 3 times in past 30 days: current sample = 14.8%, 10th graders = 11.9%, 12th graders = 22%, % of those who used marijuana

at least 3 times in past 30 days: current sample = 13.9%, 10th graders = 10.7%, 12th graders = 15.6%; Johnston et al., 2013).

Means, standard deviations, ranges of scores, and correlations among study variables can be found in Table 1. As expected, delinquency, depressive symptoms, and peer substance use were moderately positively associated with frequency of alcohol, tobacco and marijuana use. In contrast, hope was negatively associated with frequency of all 3 substances, and these were small to medium effect sizes. Being male was associated with higher levels of delinquency, elevated frequency of tobacco use, and lower levels of depressive symptoms. Age was unrelated to all study variables.

Path Analyses

A first order effects model was first estimated, whereby frequency of past 30 day tobacco, alcohol, and marijuana use were regressed on delinquency, peer substance use, depressive symptoms, hope, age, and gender in order to evaluate unique effects (See Figure 1). A second model, in which the 3 interaction terms (delinquencyXhope, peer substance useXhope, and depressive symptomsXhope) were added, was then estimated in order to evaluate hope as a moderator of these associations. Being male was associated with higher frequency of tobacco use ($\beta = -.19, p = .03$); however, no other gender or age effects were evident. As seen in Figure 1, hope was not uniquely associated with any substance use outcome when also considering other risk factors.

Depressive symptoms were unrelated to frequency of use for all three substances when other risk factors were also considered (See Figure 1). When interaction terms were added to the model, a significant depressive symptoms by hope interaction emerged for alcohol use ($\beta = -.21, p = .04$; See Figure 2). At low levels of hope, depressive symptoms were positively associated with frequency of alcohol use ($\beta = .30, p = .03$), producing a medium effect size. However, at high levels of hope, depressive symptoms and frequency of alcohol use were unrelated ($\beta = -.12, p = .32$). No other significant interactions between depressive symptoms and hope were evident ($\beta_s = -.11 \text{ \& } -.12, p_s > .06$).

Peer substance use was uniquely positively associated with frequency of tobacco and alcohol use, but not marijuana use, such that high levels of peer substance use were associated with a high frequency of tobacco and alcohol use (See Figure 1). When interaction terms were added to the model no significant peer substance use by hope interactions were found ($\beta_s = .03, -.04, \text{ \& } .13, p_s > .20$), suggesting that hope does not moderate the associations between peer substance use and frequency of substance use.

Delinquency was unrelated to frequency of use for all three substances when other risk factors were also considered (See Figure 1). When interaction terms were added to the model a significant delinquency by hope interaction was evident for frequency of tobacco and marijuana use (see Figures 3a & 3b; $\beta_s = -.41 \text{ \& } -.37, p_s = .00$), but not frequency of alcohol use ($\beta = -.24, p = .09$). At low levels of hope, delinquency was positively associated with frequency of tobacco and marijuana use ($\beta_s = .58 \text{ \& } .48, p_s < .00$, respectively), producing medium to large effect sizes. However, at high levels of hope, delinquency was

not related to frequency of marijuana use ($\beta = -.25, p = .08$) and was negatively associated with tobacco use ($\beta = -.24, p = .03$), with small to medium effect sizes.

DISCUSSION

The current study sought to advance the adolescent substance use field by evaluating hope as a moderator of the associations between common risk factors and frequency of past 30 day tobacco, alcohol, and marijuana use in a sample of Latino adolescents. Findings suggest that hope moderates the link between delinquency and 30 day frequency of tobacco and marijuana use, with a positive association between delinquency and frequency of substance use only evident when levels of hope were low. Hope also moderated the association between depressive symptoms and frequency of alcohol use, but not tobacco or marijuana use. Further, hope does not appear to impact the associations between peer substance use and frequency of adolescent substance use.

At the bivariate level delinquency was positively associated with frequency of use for all substances examined. These findings are consistent with prior research (e.g., Donovan, 2004; Kandel, Kiros, Schaffran, & Hu, 2004; Loeber, Southamer-Loeber, & White, 1999) and problem behavior theory, which suggests that if an individual is willing and able to engage delinquent acts they are at risk for other problem behaviors, including substance use (Jessor, 1992; Jessor & Jessor, 1977). However, when unique effects were examined delinquency was only positively associated with frequency of tobacco and marijuana use when levels of hope were low. Setting goals and maintaining the motivation to achieve these goals appears to protect adolescents who are at risk for using substances. Hope is associated with adaptive coping strategies such as direct problem solving, planning, and positive thinking (Lewis & Kliewer, 1996; Roeschet et al., 2010), which likely helps individuals make better choices when faced with opportunities to engage in substance use.

Interestingly, hope did not moderate the association between delinquency and frequency of alcohol use. It may be that because alcohol is the most commonly used substance among adolescents (Johnston et al., 2013) the potentially negative consequences of using alcohol are not as evident as they are for tobacco and marijuana use.

Depressive symptoms were only positively associated with frequency of alcohol use when levels of hope were low. The association between depressive symptoms and frequency of substance use may be substance specific and only under certain situations and conditions (Kassel, Stroud, & Paronis, 2003). Perhaps hope is particularly important for the association between depressive symptoms and frequency of alcohol use given that alcohol is a depressant and may elicit further negative emotions and depressive symptoms in some cases (Bailey & Baillie, 2013). Previous research has shown that ethnic minority individuals with high levels of hope tend to engage in more problem-solving coping strategies and fewer avoidant coping strategies (Chang & Banks, 2007). Thus, whereas depressed individuals may be more likely to use alcohol for self-medicating and coping purposes (Buckner et al., 2008; Hussong et al., 2008), individuals who experience depressive symptoms but have high levels of hope may employ more adaptive coping strategies and want to avoid the additional negative and depressive effects that can be associated with alcohol use, resulting in using

alcohol on fewer occasions. However, further research is warranted to further elucidate these associations, as alcohol is oftentimes used in positive social interactions.

Consistent with prior research (e.g., Aloise-Young, Graham, & Hansen, 1994; D'Amico & McCarthy, 2006; Garnier & Stein, 2002; Kandel, 1985; Kandel, Kessler, & Margulies, 1978; Simons-Morton, 2007) and current expectations, peer substance use was positively associated with frequency of substance use, particularly tobacco and alcohol use. Peers provide modeling and reinforcement for all types of behaviors, including substance use (Deater-Deckard, 2001; Dishion, Capaldi, and Yoerger, 1999; Farrington, 1995; Fergusson, Swain-Campbell, & Horwood, 2002). Interestingly, however, hope was not found to moderate the effects of peer substance use on any substance. It may be that the contributing factors associated with peer influences are more external and less intrinsic in nature. For example, parenting behavior may be more likely to impact the association between peer substance use and adolescent self-use than hope and other goal-oriented characteristics (e.g., Dorius et al., 2004; Kung & Farrel, 2000). Further research examining other factors, (e.g., parental monitoring/supervision and friendship quality/closeness) that may contribute to the link between peer influences and adolescent substance use is needed.

Limitations and Conclusions

Several limitations should be taken into consideration when interpreting findings from this study. First, all data were reported by the adolescents themselves. Although adolescents have been found to be accurate reporters of their substance use and other behavior (Crowley, et al., 2001; Johnson & Mott, 2001) and perceptions of peer use are just as important as peers' actual using behavior (Ianotti & Bush, 1992), ratings from others (e.g., parents, teachers, and peers) may have strengthened the analyses. Future research may also wish to longitudinally measure these associations in order to inform directionality of the relations. In addition, as is often found with surveys conducted in schools, there is the possibility of selection biases. For instance, students who were absent or suspended from school during data collection may be more likely to engage in substance use or delinquency. Nonetheless, several efforts were taken to increase consent and participation rates, such as translation of survey and consent materials, collaboration with school staff, and incentives for participation; rates of consent and participation were indeed high. Also, this sample was recruited from a charter high school that emphasized improving youths' academic, occupational, and social outcomes. Although charter schools are free to attend, participants' parents sought out a different school system than that being offered by the public schools. Therefore, future research may include examining these relations in adolescents attending public and private schools, as well as clinical samples, in order to better understand these relations across adolescents. Future research should also consider controlling for SES when examining these associations, as SES has been found to be associated with the variables of interest (e.g. Goodman & Huang, 2002). Unfortunately, this information was not available in the current study.

Despite these limitations, the present study makes several important contributions to the adolescent substance use literature. Current findings suggest that hope is an important factor to consider for the prevention of adolescent substance use among delinquent youth,

specifically frequency of tobacco and marijuana use. Further, results indicate that hope can help to buffer the link between depressive symptoms and frequent alcohol use. Future research should extend these results by examining how hope may operate in concert with various coping strategies (e.g., social support seeking, cognitive distancing, humor) to affect adolescent engagement in substance use. Although hope is considered dispositional in nature (Snyder, 2002), recent studies indicate that changes in levels of hopeful thinking can occur over time through sustained interventions. Thus, interventions that focus on hope may help to prevent adolescent substance use among those exhibiting risk factors for substance use behavior. Indeed, there is growing support for the utility of hope-based intervention strategies in enhancing levels of hope, self-worth and life satisfaction among adolescents (e.g., Lopez et al., 2000; Margues, Lopez, & Pais-Ribeiro, 2011). These programs are designed to educate youth on hope and to teach them how to recognize goals, set realistic goals, and overcome obstacles that may get in the way of these goals. Further research is needed, however, to evaluate whether these hope enhancement programs have an impact on substance use behavior.

Acknowledgments

The writing of this manuscript was supported in part by a NIDA fellowship grant (F31 DA034423) awarded to the second author and a NIMH fellowship grant (F31 MH098494) awarded to the fourth author.

References

- Achenbach, TM.; Rescorla, LA. Manual for the ASEBA school-age forms & profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families; 2001.
- Aiken, LS.; West, SG. Multiple Regression: Testing and interpreting interactions. Newbury Park, CA: Sage Publication; 1991.
- Alouse-Young PA, Graham JW, Hansen WB. Peer influence on smoking initiation during early adolescence: A comparison of group members and group outsiders. *Journal of Applied Psychology*. 1994; 79(2):281–287. [PubMed: 8206817]
- Arbuckle, JL. Full information estimation in the presence of incomplete data. In: Marcoulides, GA.; Shumaker, RE., editors. *Advanced structural equation modeling: Issues and techniques*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.; 1996. p. 243-277.
- Audrain-McGovern J, Rodriguez D, Kassel JD. Adolescent smoking and depression: evidence for self-medication and peer smoking mediation. *Addiction*. 2009; 104(10):1743–1756. [PubMed: 19549056]
- Bailey RC, Baillie AJ. The relationship between placebo alcohol and affect: Motives for drinking. *Drug and Alcohol Review*. 2013; 32:162–169. [PubMed: 22994550]
- Brook JS, Balka EB, Whiteman M. The risks for late adolescence of early adolescent marijuana use. *American Journal of Public Health*. 1999; 89:1549–1554. [PubMed: 10511838]
- Buckner JD, Schmidt NB, Lang AR, Small JW, Schlauch RC, Lewinsohn PM. Specificity of social anxiety disorder as a risk factor for alcohol and cannabis dependence. *Journal of Psychiatric Research*. 2008; 42:230–239. [PubMed: 17320907]
- Caravajal SC, Clair SD, Nash SG, Evans RI. Relating optimism, hope, and self-esteem to social influences in deterring substance use in adolescents. *Journal of Social and Clinical Psychology*. 1998; 17:443–465.
- Catalano, RF.; Hawkins, JD. The Social Development Model: A theory of antisocial behavior. In: Hawkins, JD., editor. *Delinquency and crime: Current theories*. Cambridge, UK: Cambridge University Press; 1996. p. 149-197.

- Cedeno LA, Elias MJ, Kelly S, Chu BC. School violence, adjustment, and the influence of hope on low-income, African American youth. *American Journal of Orthopsychiatry*. 2010; 80:213–226. [PubMed: 20553515]
- Chan Y, Dennis ML, Funk RR. Prevalence and comorbidity of major internalizing and externalizing problems among adolescents and adults presenting to substance abuse treatment. *Journal of Substance Abuse Treatment*. 2008; 34:14–24. [PubMed: 17574804]
- Ciarrochi J, Heaven PCL, Davies F. The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: A longitudinal study. *Journal of Research in Personality*. 2007; 41:1161–1178.
- Clarke VG, Eyles HJ, Evans M. The incident and correlates of smoking among delinquent boys committed for residential training. *British Journal of Addiction*. 1971; 67(1):65–71.
- Cohen, J. *Statistical power analysis for the behavioral sciences*. 2nd ed.. Hillsdale: Erlbaum; 1988.
- Cohen, J.; Cohen, P.; West, SG.; Aiken, LS. *Applied multiple regression/correlation analyses for the behavioral sciences*. 3 ed.. Mahwah: Erlbaum; 2003.
- Crowley TJ, Mukulich SK, Ehlers KM, Whitmore EA, Macdonald MJ. Validity of structured clinical evaluations in adolescents with conduct and substance problems. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2001; 40:265–273. [PubMed: 11288767]
- D'Amico EJ, McCarthy DM. Escalation and initiation of younger adolescents' substance use: The impact of perceived peer use. *Journal of Adolescent Health*. 2006; 39:481–487. [PubMed: 16982381]
- Deater-Deckard K. Annotation: Recent research examining the role of peer relationships in the development of psychopathology. *Journal of Child Psychology and Psychiatry*. 2001; 42:565–579. [PubMed: 11464962]
- Dishion, TJ.; Capaldi, DM.; Yoerger, K. *Journal of Adolescent Research*. Vol. 14. Sage Publications; 1999. Middle childhood antecedents to progressions in male adolescent substance use: An ecological analysis of risk and protection; p. 175-205.
- Donovan JE. Adolescent Alcohol initiation: A review of psychosocial risk factors. *Journal of Adolescent Health*. 2004; 35(6):529.e7–529.e18. [PubMed: 15581536]
- Dorius CJ, Bahr SJ, Hoffmann JP, Harmon EL. Parenting practices as moderators of the relationship between peers and adolescent marijuana use. *Journal of Marriage and Family*. 2004; 66:163–178.
- Durlak JA. How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology*. 2009
- Eaton DK, Kann L, Kinchen S, Shanklin S, Flint KH, Hawkins J, Lim C. Youth risk behavior surveillance-United States, 2011. *Morbidity and Mortality Weekly Report (MMWR) Surveillance Summary*. 2012; 61(4):1–162.
- Eklund JM, af Klinteberg B. Alcohol use and patterns of delinquent behaviour in male and female adolescents. *Alcohol & Alcoholism*. 2009; 44(6):607–614. [PubMed: 19131390]
- Farrington DP. The development of offending and antisocial behavior from childhood: Key findings from the Cambridge study in delinquent development. *Journal of Child Psychology and Psychiatry*. 1995; 36:929–964. [PubMed: 7593403]
- Fergusson DM, Swain-Campbell NR, Horwood LJ. Deviant peer affiliations, crime and substance use: A fixed effects regression analysis. *Journal of Abnormal Child Psychology*. 2002; 30:419–430. [PubMed: 12108769]
- Fergusson DM, Goodwin RD, Horwood LJ. Major depression and cigarette smoking: results of a 21-year longitudinal study. *Psychological Medicine*. 2003; 33(8):1357–1367. [PubMed: 14672244]
- Fergusson DM, Horwood LJ, Beautrais AL. Cannabis and educational achievement. *Addiction*. 2003; 98(12):1681–1692. [PubMed: 14651500]
30. Fergusson DM, Lynskey MT, Horwood LJ. The short term consequences of early cannabis use. *Journal of Abnormal Child Psychology*. 1996; 24:499–512. [PubMed: 8886945]
- Fergusson DM, Woodward LJ, Horwood LJ. Childhood peer relationship problems and young people's involvement with deviant peers in adolescence. *Journal of Abnormal Child Psychology*. 1999; 27:357–369. [PubMed: 10582837]
- Fite PJ, Colder CR, Lochman JE, Wells KC. The relation between childhood proactive and reactive aggression and substance use initiation. *Journal of Abnormal Child Psychology*. 2008; 36(2):261–271. [PubMed: 17823863]

- Garnier HE, Stein JA. An 18-Year model of family and peer effects on adolescent drug use and delinquency. *Journal of Youth and Adolescence*. 2002; 31(1):45–56.
- Goodman E, Capitman J. Depressive symptoms and cigarette smoking among teens. *Pediatrics*. 2000; 106(4):748–755. [PubMed: 11015518]
- Goodman E, Huang B. Socioeconomic status, depressive symptoms, and adolescent substance use. *Archives of Pediatrics and Adolescent Medicine*. 2002; 156:448–453. [PubMed: 11980549]
- Hagen KA, Myers BJ, Mackintosh VH. Hope, social support, and behavioral problems in at-risk children. *American Journal of Orthopsychiatry*. 2005; 75(2):211–219. [PubMed: 15839758]
- Hawkins JD, Weis JG. The social development model: An integrated approach to delinquency prevention. *Journal of Primary Prevention*. 1985; 6:73–97. [PubMed: 24271382]
- Hussong AM, Gould LF, Hersh MA. Conduct problems moderate self-medication and mood-related drinking consequences in adolescents. *Journal of Studies on Alcohol and Drugs*. 2008; 69:296–307. [PubMed: 18299772]
- Iannotti RJ, Bush PJ. Perceived vs. actual friends' use of alcohol, cigarettes, marijuana, and cocaine: Which has the most influence? *Journal of Youth and Adolescence*. 1992; 21:375–389. [PubMed: 24263849]
- Jessor R. Risk Behavior in Adolescence -A Psychological Framework for Understanding and Action. *Adolescents at Risk*. 1992; 12:19–34.
- Jessor, R.; Jessor, SL. Problem behavior and psychosocial development: A longitudinal study of youth. New York: Academic Press; 1977.
- Johnson TP, Mott JA. The reliability of self-reported age of onset of tobacco, alcohol and illicit drug use. *Addiction*. 2001; 96:1187–1198. [PubMed: 11487424]
- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975–2012: Volume I, Secondary school students. Ann Arbor: Institute for Social Research, The University of Michigan; 2013.
- Kandel DB. On processes of peer influences in adolescent drug use: A developmental perspective. *Advances in Alcohol Substance Use*. 1985; 4:139–163.
- Kandel, DB.; Kessler, RC.; Margulies, RZ. Antecedents of adolescent initiation into stages of drug use. In: Kandel, DB., editor. *Longitudinal research on drug use*. New York: Wiley; 1978. p. 73–100.
- Kandel DB, Kiros GE, Schaffran C, Hu MC. Racial/ethnic differences in cigarette smoking initiation and progression to daily smoking: A multilevel analysis. *American Journal of Public Health*. 2004; 94(1):128–135. [PubMed: 14713710]
- Kassel JD, Stroud LR, Paronis CA. Smoking, stress, and negative affect: Correlation, causation, and context across stages of smoking. *Psychological bulletin*. 2003; 129(2):270. [PubMed: 12696841]
- King SM, Iacono WG, McGue M. Childhood externalizing and internalizing psychopathology in the prediction of early substance use. *Addiction*. 2004; 99(12):1548–1559. [PubMed: 15585046]
- Kline, R. *Principal and Practice of Structural Equation Modeling*. 3rd Edition. New York: Guilford Press; 2010.
- Kung EM, Farrell AD. The role of parents and peers in early adolescent substance use: An examination of mediating and moderating effects. *Journal of Child and Family Studies*. 2000; 9:509–528.
- Kwon P. Hope, defense mechanisms, and adjustment: Implications for false hope and defensive hopelessness. *Journal of Personality*. 2002; 70(2):207–231. [PubMed: 11908846]
- Loeber R, Stouthamer-Loeber M, White HR. Developmental aspects of delinquency and internalizing problems and their association with persistent juvenile substance use between ages 7 and 18. *Journal of Clinical Child Psychology*. 1999; 28(3):322–332. [PubMed: 10446681]
- Levy S, Sherritt L, Gabrielli J, Shrier LA, Knight JR. Screening adolescents for substance use-related high-risk sexual behaviors. *Journal of Adolescent Health*. 2009; 45(5):473–477. [PubMed: 19837353]
- Lewis HA, Kliewer W. Hope, coping, and adjustment among children with sickle cell disease: Tests of mediator and moderator models. *Journal of Pediatric Psychology*. 1996; 21(1):25–41. [PubMed: 8820071]

- Lopez, SJ.; Floyd, RK.; Ulven, JC.; Snyder, CR. Hope therapy: Helping clients build a house of hope. In: Snyder, CR., editor. *Handbook of Hope: Theory, measures, and applications*. San Diego, CA: Academic; 2000. p. 123-150.
- Marques SC, Lopez SJ, Pais-Ribeiro JL. "Building hope for the future": A program to foster strengths in middle-school students. *Journal of Happiness Studies*. 2011; 12:139–152.
- McKowen JW, Thompson MC, Brown TA, Asarnow JR. Longitudinal associations between depression and problematic substance use in the youth partners in care study. *Journal of Clinical Child & Adolescent Psychology*. 2013:1–12. ahead-of-print.
- McKenzie M, Olsson CA, Jorm AF, Romaniuk H, Patton GC. Association of adolescent symptoms of depression and anxiety with daily smoking and nicotine dependence in young adulthood: findings from a 10-year longitudinal study. *Addiction*. 2010; 105(9):1652–1659. [PubMed: 20707783]
- McKenzie M, Jorm AF, Romaniuk H, Olsson CA, Patton GC. Association of adolescent symptoms of depression and anxiety with alcohol use disorders in young adulthood: findings from the Victorian Adolescent Health Cohort Study. *Medical Journal of Australia*. 2011; 195(3):S27–S30. [PubMed: 21806515]
- Miller, T. The social costs of adolescent problem behavior. In: Biglan, A.; Brennan, PA.; Foster, SL.; Holder, HD., editors. *Helping Adolescents at Risk: Prevention of Multiple Problem Behaviors*. New York: Guilford Press; 2004. p. 31-56.
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. Sixth Edition. Los Angeles, CA: Muthén & Muthén; 1998–2011.
- Oetting ER, Beauvais F. Peer cluster theory: Drugs and the adolescent. *Journal of Counseling and Development*. 1986; 65:17–22.
- Patton GC, Coffey C, Carlin JB, Degenhardt L, Lynskey M, Hall W. Cannabis use and mental health in young people: cohort study. *Bmj*. 2002; 325(7374):1195–1198. [PubMed: 12446533]
- Pentz MA, Dwyer JH, MacKinnon DP, Flay BR, Hansen WB, Wang EY, et al. A multicomunity trial for primary prevention of adolescent drug abuse: Effects on drug use prevalence. *Journal of the American Medical Association*. 1989; 262:3259–3266. [PubMed: 2785610]
- Rhode P, Lewinsohn PM, Seeley JR. Psychiatric comorbidity with problematic alcohol use in high school students. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1996; 35:101–109. [PubMed: 8567601]
- Roesch SC, Duangado KM, Vaughn AA, Aldridge AA, Villodas F. Dispositional hope and the propensity to cope: A daily diary assessment of minority adolescents. *Cultural Diversity and Ethnic Minority Psychology*. 2010; 16:191–198. [PubMed: 20438157]
- Simons-Morton B. Social influences on adolescent substance use. *American Journal of Health Behavior*. 2007; 31(6):672–684. [PubMed: 17691881]
- Snyder, CR. *The psychology of hope: You can get there from here*. New York: Free Press; 1994.
- Snyder CR. Hope theory: Rainbows in the mind. *Psychological Inquiry*. 2002; 13(4):249–275.
- Snyder CR, Hoza B, Pelham WE, Rapoff M, Ware L, Danovsky M, Highberger L, Ribinstein H, Stahl KJ. The development and validation of the Children's Hope Scale. *Journal of Pediatric Psychology*. 1997; 22:399–421. [PubMed: 9212556]
- Steinberg L, Dornbusch SM, Brown BB. Ethnic differences in adolescent achievement: An ecological perspective. *American Psychologist*. 1992; 47:723–729. [PubMed: 1616171]
- Tate SR, Patterson KA, Nagel BJ, Anderson KG, Brown SA. Addiction and stress in adolescents. *Stress and addiction: Biological and psychological mechanisms*. 2007:249–262.
- Toumbourou JW, Stockwell T, Neighbors C, Marlatt GA, Sturge J, Rehm J. Interventions to reduce harm associated with adolescent substance use. *The Lancet*. 2007; 369(9570):1391–1401.
- Wills TA, Cleary SD. Peer and adolescent substance use among 6th–9th graders: Latent growth analyses of influence versus selection mechanisms. *Health Psychology*. 1999; 18:453–463. [PubMed: 10519461]
- Wolitzky-Taylor K, Bobova L, Zinbarg RE, Mineka S, Craske MG. Longitudinal investigation of the impact of anxiety and mood disorders in adolescence on subsequent substance use disorder onset and vice versa. *Addictive Behaviors*. 2012; 37(8):982–985. [PubMed: 22503436]

Wu P, Hoven CW, Liu X, Fuller CJ, Fan B, Musa G, Cook JA. The relationship between depressive symptom levels and subsequent increases in substance use among youth with severe emotional disturbance. *Journal of studies on alcohol and drugs*. 2008; 69(4):520–527. [PubMed: 18612567]

Figure 1.
Estimated First Order Effects Path Model

Note. * $p < .05$. Values outside of parentheses represent standardized betas and values inside parentheses represent standard errors. Covariances between exogenous variables were estimated and gender and age were included in the model as covariates, but are not included in the figure for clarity purposes. Tobacco, alcohol, and marijuana use frequencies represent past 30 day use.

Figure 2. Associations between Depressive Symptoms and Frequency of Alcohol Use within Past 30 Days at High and Low Levels of Hope.

a and b

Figure 3.

- a. Associations between Delinquency and Frequency of Tobacco Use within Past 30 Days at High and Low Levels of Hope.
- b. Associations between Delinquency and Frequency of Alcohol Use within Past 30 Days at High and Low Levels of Hope

Table 1

Correlations, Means, Standard Deviations, and Range of Scores.

	1	2	3	4	5	6	7	8	9
1. Age	-								
2. Gender	.01	-							
3. Hope	-.01	-.03	-						
4. Depressive Symptoms	-.14	.27*	-.41*	-					
5. Peer Substance Use	.08	-.13	-.12	.14	-				
6. Delinquency	-.05	-.27*	-.06	.16	.52*	-			
7. Tobacco Use Frequency	-.04	-.19*	-.26*	.29*	.39*	.43*	-		
8. Alcohol Use Frequency	.00	-.13	-.27*	.31*	.42*	.37*	.78*	-	
9. Marijuana Use Frequency	-.07	-.09	-.18*	.24*	.30*	.31*	.69*	.57*	-
Mean	16.14	-	4.11	.62	1.56	1.54	.80	1.49	1.56
Standard Deviation	1.30	-	1.10	.47	1.00	2.07	3.24	3.56	4.71
Range of Scores	14-20	-	1-6	0-2	0-4	0-10	0-28	0-29	0-30

Note

* $p < .05$; Tobacco, alcohol, and marijuana use frequencies represent past 30 day use.