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Prospective Effects of Possible Selves on Alcohol Consumption in Adolescents

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Abstract

Possible selves, cognitions about the self that reflect hopes, fears, and expectations for the future, are reliable predictors of health risk behaviors but have not been explored as predictors of adolescents' alcohol use. In a secondary analysis of data from 137 adolescents, we examined the influence of possible selves assessed in eighth grade on alcohol consumption (yes/no and level of use) in ninth grade. Having a most important feared possible self related to academics in eighth grade predicted alcohol abstinence in ninth grade. Among those who reported alcohol use, having many hoped-for possible selves and a most important hoped-for possible self related to academics in eighth grade predicted lower level of alcohol consumption in ninth grade. Interventions that foster the personal relevance and importance of academics and lead to the development of hoped-for possible selves may reduce adolescents' alcohol consumption.

Keywords

Alcohol use; identity development; self-concept; cognition; possible selves; adolescence

The transition from middle to high school is a critical period of escalating alcohol consumption. Adolescents who drink experience more behavioral problems and are more likely than adolescents who do not drink to have substance abuse/dependence disorders during later adolescence and young adulthood (Bonomo, Bowes, Coffey, Carlin, & Patton, 2004; Ellickson, Tucker, & Klein, 2003; Hingson, Heeren, & Winter, 2006). Moreover,

adolescent drinkers with high levels of consumption are the most vulnerable, with the greatest risk of internalizing symptoms and alcohol abuse/dependence disorders in young adulthood (Ellickson et al., 2003; Huurre et al., 2010; Mayhew, Flay, & Mott, 2000; Trim, Meehan, King, & Chassin, 2007). Despite available evidence-based interventions (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014), national lifetime alcohol use prevalence estimates remain unacceptably high: 33% for 8th graders and 62% for 9th graders (Centers for Disease Control and Prevention, 2012; Johnston, O'Malley, Bachman, & Schulenberg, 2012).

It is widely accepted that adolescents' alcohol use is multi-determined. Many investigators have focused on contextual determinants (e.g., parent and peer influences), but these factors are not easily amenable to change (Smit, Verdurmen, Monshouer, & Smit, 2008). Some intra-individual determinants (e.g., cognitions) may be more modifiable. One intra-individual factor that is an integral component in several interventions is the development of personal goals (for examples see Across Ages, SPORT Prevention Plus Wellness, and Active Parenting of Teens: Families in Action in SAMHSA's National Registry of Evidence-based Programs and Practices). Yet few investigators have focused on the role of personal goals as determinants of alcohol use in adolescents, and consequently, little is known about their role in protecting against or motivating alcohol use in early adolescents. In this study, we used Markus' model of possible selves as goal structures (Markus & Nurius, 1986) to explore properties of possible selves that predict patterns of alcohol use across this critical developmental transition.

Determinants of Adolescent Alcohol Use

The major contextual determinants of adolescents' drinking behaviors include parent and family characteristics (Abar, Abar, & Turrisi, 2009; Barrett & Turner, 2006; Habib et al., 2010; Marsiglia, Kulis, Parsai, Villar, & Garcia, 2009; Trim et al., 2007) and peer/friend influences (Donovan, 2004; Nash, McQueen, & Bray, 2005; Scheier & Botvin, 1997). These factors are difficult to change. For example, family structure and parental alcohol problems require family/parental engagement for an effective intervention. Because adolescents choose friends with similar experiences (Linden-Andersen, Markiewicz, & Doyle, 2009), positive peer attitudes toward alcohol and peer alcohol consumption likely reflect an already-heightened vulnerability to problematic alcohol use. Therefore, the utility of focusing on contextual factors to improve approaches to intervention and prevention is challenging.

Intra-individual determinants include personality traits (Krank et al., 2011; Malmberg et al., 2013) and alcohol-related cognitions (expectancies, prototypes, and intentions) (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008; Gerrard et al., 2002; Simons-Morton, 2004; Zamboanga, Schwartz, Ham, Hernandez Jarvis, & Olthuis, 2009). Given that personality traits are largely genetically determined and enduring (Hampson & Goldberg, 2006; Hopwood et al., 2009), they also are also difficult to mitigate. However, alcohol-related cognitions have been conceptualized as proximal factors that can mediate both contextual and individual determinants of drinking behaviors (Scheier & Botvin, 1997; Sieving, Maruyama, Williams, & Perry, 2000).

To date, study of these cognitions has focused on beliefs about the effects of alcohol on people in general (Simons-Morton, 2004; Zamboanga et al., 2009) or the perceived attributes of the “type of adolescent” who drinks (Gerrard et al., 2008; Gerrard et al., 2002). These cognitions may not have the motivational influence of more individualized cognitions about the self. For example, intentions are a type of cognition that has been shown to influence behavior but only for persons who also have an elaborated self-cognition in the domain (Kendzierski & Whitaker, 1997; Sheeran & Orbell, 2000).

Possible Selves

Possible selves reflect one’s hopes (“hoped-for” possible selves), fears (“feared” possible selves), and expectations (“expected” possible selves) for the future (Markus & Nurius, 1986). They are considered a type of goal structure but are distinct in that they are highly personalized and specific. Possible selves are cognitive structures that include vivid images of the self in the future state along with procedural knowledge in the form of strategies for either achieving or avoiding possible selves (Cross & Markus, 1991; Markus & Nurius, 1986). They are powerful predictors of adolescents’ behavior (Aloise-Young, Hennigan, & Leong, 2001; Newberry & Duncan, 2001; Oyserman, Bybee, & Terry, 2006; Oyserman & Markus, 1990a, 1990b). As modifiable memory structures, possible selves may be a promising intervention target, particularly in the formative stages of identity development (Oyserman, Terry, & Bybee, 2002), but have yet to be explored in relation to alcohol use in adolescence.

Due to different personal experiences, values, and goals, each individual has a unique collection of possible selves. Some investigators have focused on properties of the total collection of possible selves, e.g., the number of hoped-for (Black, Stein, & Loveland-Cherry, 2001), number of feared (Oyserman & Markus, 1990a), number of expected (Aloise-Young et al., 2001), and number of balanced pairs (a hoped-for and feared possible self in the same domain, e.g., a hoped-for possible self to graduate from high school and a feared possible self of not graduating from high school; Aloise-Young et al., 2001; Oyserman & Markus, 1990a, 1990b). Other investigators have focused on a single possible self, e.g., presence or absence of a possible self in a specific content domain including alcohol use, e.g., “problem drinker” (Corte & Szalacha, 2010; Lee et al., in press), binge drinker (Quinlan, Jaccard, & Blanton, 2006), or the content domain of the most important possible self (Hooker & Kaus, 1992).

Previous research has been focused mainly on properties of the total array of possible selves or on properties of a single domain-specific possible self, making results difficult to synthesize as a foundation for practice. In the present study, we examined all possible-self properties of eighth-graders simultaneously, to determine their influence on alcohol-use behaviors in ninth grade, while controlling for gender, other known social determinants, and eighth-grade alcohol consumption. The research question was: do the total array of possible selves (hoped-for, feared, expected, and balanced pairs of possible selves) and the content specific possible selves (alcohol related possible self and the most important possible self) in eighth grade simultaneously predict the levels of alcohol consumption in ninth grade after controlling for known determinants?

Method

Study Design and Setting

We conducted a secondary analysis of longitudinal data from a study of self-cognitions and risk behaviors in adolescents across the transition from eighth to ninth grade (Stein, Roeser, & Markus, 1998). In the original study, data were collected at a public junior high school in a working-class, suburban community, from a group of students in eighth grade and then the same group a year later in ninth grade, in 1992 and 1993. In both grade groups, possible selves and perceived influence of friends were measured in individual interactions; family-related variables and alcohol use were measured using classroom-administered questionnaires.

Although the original data were collected in the 1990s, the key domains of self-definition in adolescents have remained stable over time. For example, among adolescents, Oyserman and Markus (1990a) showed that the most common possible-self domains were friendships, academics, occupation, and being happy. Similarly, findings in the 2000s showed friendships, academics, occupation, and relationship/interpersonal to be the most frequent possible selves or important life goals (Knox, Funk, Elliott, & Bush, 2000; Shapka & Keating, 2005). In a more recent study, most high school students generated possible selves related to occupation, academics, relationship, sport, and risk behaviors (Mainwaring & Hallam, 2010).

To our knowledge, this is a unique dataset, containing the idiographic and longitudinal data on the content and organization of the entire set of possible selves and alcohol use in adolescents during the transition to high school. Given that the domain of adolescents' self-definition has remained stable over the last several decades, this dataset provides a relevant and unique opportunity to explore the role of different possible-self properties in alcohol use behaviors during this transition period.

Participants

Of the 160 adolescents in the original study, 137 who completed measures in both 8th and 9th grades were included in this analysis. Mean age in the eighth grade was 13.5 ($SD = 0.6$) years, and 50% were female. Most adolescents were Caucasian (84%), followed by African Americans (13%), and others (3%).

Measures

Alcohol consumption—Six questions addressed frequency and quantity of beer, wine, and hard liquor use in the previous 12 months (Shope, Copeland, & Dielman, 1994). Responses to frequency questions (e.g., “How often did you drink beer [wine, hard liquor] in the past 12 months?”) ranged from 0 (*haven't had a drink in the past 12 months*) to 5 (*drink every day*). Responses to quantity questions (e.g., “When you drank beer [wine, hard liquor] during the past 12 months, how many cans or bottles (glasses or shots) did you usually have at one time?”) ranged from 0 (*haven't had a drink in the past 12 months*) to 6 (*seven or more drinks*).

Quantity and weekly frequency were multiplied to reflect the average number of drinks per week in the previous 12 months for beer, wine, and hard liquor. Then, the number of drinks per week for each beverage type was summed to reflect the total alcohol consumption per week in the previous 12 months.

The validity of this measure has been supported by using a bogus pipeline procedure that revealed non-significant effects on alcohol use reports (Campanelli, Dielman, & Shope, 1987). Test-retest reliability of self-reported alcohol use in adolescents at both population and individual levels has also been shown (Levy et al., 2004; Lintonen, Ahlström, & Metso, 2004).

Possible selves—Hoped-for, feared, and expected possible selves in eighth grade were measured with an open-ended possible-selves questionnaire (Markus & Nurius, 1986). Participants listed as many hoped-for possible selves as they could (at least 3) in response to “What do you hope you will be like next year?” They similarly listed feared possible selves in response to “What do you want to avoid being or are afraid you might be next year?” and expected possible selves in response to “What do you expect you might be like next year?”

The hoped-for, feared, and expected possible-self descriptors were content-coded in the parent study using a coding scheme developed by Herzog and colleagues (Herzog, Franks, Markus, & Holmberg, 1998; Herzog & Markus, 1999). Inter-rater reliability for the most specific content code categories was 83% in eighth grade and 89% in ninth grade. In the current study, we used higher-level codes (e.g., relationships with parents, friendships, occupation, academics, sports/exercise activities, health behaviors, risky behaviors, and physical appearance) to define the content domains of possible selves and recoded a random sample of 10% of participants’ possible selves to confirm accuracy of the original coding.

Properties of the total array of possible selves: Numbers of hoped-for, feared, and expected possible selves were derived from each participant’s self-generated list. Number of balanced pairs of possible selves was the total of matched hoped-for (e.g., hope I will get along in school) and feared (e.g., fear I will not get along in school) possible-self pairs in the same content domain (Oyserman & Markus, 1990b). Each possible self was counted in only one balanced pair.

Properties related to a specific content domain: Possible self related to alcohol was determined by reviewing all possible self descriptions and coding them for presence/absence of alcohol-related content. Given that basic memory literature shows that the order of spontaneously-generated items (e.g., self-descriptors) reflects accessibility in memory and thus, relative importance (Krosnick, 1989; Towse, Cowan, Hitch, & Horton, 2008), the first-listed hoped-for, feared, and expected possible selves were considered the most important possible selves and were content-coded using the higher-level content codes.

Social determinants of alcohol consumption—Family structure was measured by using multiple-choice questions to ask participants, “Who do you live with?” with response options of mother, father, stepparent, grandparent, other adult, and someone else. Family structure was dichotomized into “single-parent family” and “two-parent family.”

Family cohesion was measured by the 16-item family cohesion subscale from Family Adaptability and Cohesion Scales (Olson, 1982). The 5-point response option for each statement ranges from *almost never* to *almost always*. Adequate reliability and validity was demonstrated with a national survey of couples and families (Olson, 1982). Cronbach alpha for this scale was 0.86 in the present study. Because family cohesion has a curvilinear relationship with family functioning (Green, Harris, Forte, & Robinson, 1991; Olson, 1991), we dichotomized family cohesion into “effective cohesion” (i.e., midrange levels of cohesion) to reflect optimal family functioning and “ineffective cohesion” (i.e., high or low cohesion) to reflect poor family functioning (Green et al., 1991; Olson, 1982).

Parental alcohol problems were measured with the short form of the Children of Alcoholics Screening Test (CAST; Hodgins, Maticka-Tyndale, El-Guebaly, & West, 1993). The CAST has high agreement with close family member reports of parental alcohol problems (Staley & El-Guebaly, 1991). Five items in a yes/no format address respondents’ responses to parental alcohol problems, e.g., “Did you ever wish that a parent would stop drinking?” The number of “Yes” answers was summed to obtain a total score for each adolescent (range 0–5). In the current study, the Cronbach alpha coefficient was 0.77.

Perceived influence of friends was measured by a question: “How important do you think your friends were in making you the way you are now?” (Oyserman, 1993). Responses are scored on a 5-point scale (1 = *not at all* to 5 = *very*). Higher scores indicate higher perceived influence of friends.

Statistical Analysis

Zero-inflated gamma regression models (Blough & Ramsey, 2000; Lachenbruch, 2002) were estimated with the SAS PROC NL MIXED (McLerran, 2008) to determine the effects of eight possible-self properties measured in eighth grade on alcohol consumption in ninth grade, while controlling for family structure, family cohesion, parental alcohol problems, friends’ influence, gender, and eighth-grade alcohol consumption. Zero-inflated gamma regression modeling was used because the dependent variable, level of alcohol consumption, is an interval-level scale (scores with decimals) rather than events/count data and includes high zeroes. Using this approach, the likelihood of ninth- grade alcohol consumption was estimated simultaneously with the level of alcohol consumption for those participants who had used alcohol in the last 12 months. Ninth-grade alcohol consumption was estimated using logistic regression (zero alcohol consumption versus non-zero values). For all non-zero values, level of ninth-grade alcohol consumption was estimated using gamma regression because of the highly skewed distribution.

Relationships between predictors and ninth-grade alcohol consumption were expressed as adjusted odds ratios (*ORs*) in the first step and as risk ratios of the mean level of alcohol consumption in the second step (Blough & Ramsey, 2000). In gamma regression, for a predictor that is a continuous variable, a one-unit increase in the predictor variable results in an increase of the mean outcome value multiplied by $Exp(B)$. For a dichotomous predictor, the mean outcome value of the corresponding group is $Exp(B)$ times higher than the reference group.

Because there is no well-established method to estimate power for zero-inflated models, we based our power analysis on multiple linear regression. With 14 predictors, alpha .05, and effect size .15, our power would be .81 with our sample size of 137.

The model building process included four steps. Model 1 included the control variables (gender and 8th grade alcohol consumption in the last 12 months). In Model 2, social determinants (family structure, family cohesion, parental alcohol problems, and perceived friends' influence) were added. In Model 3, properties of the total array of possible selves were added. In Model 4, properties related to a specific content domain of possible selves were added. Model fit was assessed by likelihood ratio (*LR*) tests.

Results

Alcohol Consumption

Fifty-seven percent ($n = 78$) of the adolescents reported alcohol consumption in eighth grade and 68% ($n = 91$) in ninth grade. Among those adolescents who reported drinking, the majority (85% in eighth grade and 63% in ninth grade) reported less than one drink/week. Mean alcohol consumption levels for both grades are shown in Table 1. One boy reported very high alcohol consumption (80.6 drinks/week) in ninth grade. We ran further analyses with and without this participant; the findings were unchanged so we kept this participant's data in the analyses.

Properties of Possible Selves

Descriptive statistics for all possible self properties are shown in Table 1. For the properties related to a specific content domain, few adolescents spontaneously generated a possible self related to alcohol. In these cases, these possible selves were feared possible selves related to alcohol, or feared drinker possible selves (e.g., "I won't drink like my sister," "I don't want to turn into someone who drinks," and "I am afraid of getting back into drinking.") Academics was most frequently listed as the first (therefore, considered most important) content domain for hoped-for, feared, and expected possible selves. Table 2 shows modest bivariate correlations among the possible-self properties.

Social Determinants

More than one-third of the sample (36.5%) reported living in single-parent families. Approximately half reported ineffective family cohesion. Among these, 93% ($n = 64$) reported very low levels of cohesion (disengaged) and 7% ($n = 5$) reported very high levels of cohesion (enmeshed). The mean CAST score reflecting parental alcohol problems was low (Mean = 0.86, $SD = 1.3$), and perceived influence of friends was moderately high (Mean = 3.6, $SD = 1.2$).

Predicting Alcohol Consumption

Overall, the model fit improved from Model 1 (with just the control variables) to Model 4 (with control variables, social determinants, and all properties of possible selves). The *LR* test between Model 1 and Model 4 was significant ($\chi^2(24) = 69.8, p < .05$).

Because Model 4 (the complete model that included all predictors) was the best-fitting model, we describe the findings in detail for this model (Table 3). None of the properties of the total array of possible selves were significant predictors for estimating no alcohol consumption versus any alcohol consumption in the last 12 months. Having a most-important feared possible self related to academics in eighth grade, eighth-grade alcohol consumption, and parental alcohol problems were significant predictors of abstaining from alcohol over the last 12 months in ninth grade, after controlling for all other predictors. Adolescents who had a most-important feared possible self related to academics were more than three times more likely than those who did not to abstain from alcohol in ninth grade. Adolescents who drank alcohol in eighth grade and those who had higher parental alcohol problems were less likely to abstain from alcohol in ninth grade.

For estimating level of consumption for all non-zero values of ninth-grade alcohol consumption, having many hoped-for possible selves and having a most-important possible self related to academics predicted lower levels of alcohol consumption in ninth grade after controlling for other predictors. On average, for each hoped-for possible self in the eighth grade, the expected ninth-grade mean alcohol consumption level was reduced by 39%. Adolescents who had a most-important hoped-for possible self related to academics in the eighth grade had expected ninth-grade mean levels of alcohol consumption that were 82% lower than those who did not. The known determinants (female gender, higher eighth-grade alcohol consumption levels, and single-parent family structure) also significantly predicted ninth-grade levels of alcohol consumption.

To clarify whether the influence of possible selves related to academics on alcohol consumption was associated with those being the most-important possible selves, we also examined whether hoped-for, expected, or feared possible selves related to academics anywhere in the possible-self repertoires predicted alcohol consumption. Having a hoped-for, expected, or feared possible self related to academics in the possible self repertoire did not predict ninth-grade use or non-use of alcohol or level of alcohol consumption.

Discussion

We demonstrated that specific properties of possible selves are differentially protective against two alcohol-related outcomes (any alcohol use and level of use) in adolescents during the transition from middle to high school. Properties of a single possible-self domain (academics) and properties of the total array of possible selves (number of hoped-for possible selves) predicted alcohol use and level of alcohol consumption one year later. Specifically, having a most-important feared possible self related to academics in eighth grade predicted abstention from alcohol in ninth grade. Among adolescents who drank in ninth grade, having many hoped-for possible selves and having a most-important hoped-for possible self related to academics in eighth grade predicted lower levels of consumption in ninth grade. These findings contribute new knowledge about alcohol consumption in adolescents during this important developmental period and hold potential for shaping approaches to intervention in the future.

Different possible-self properties predicted whether or not and how much an adolescent would drink during the transition from middle to high school. Abstention from alcohol in ninth grade was driven by having a most-important feared conception of the self in the future related to academics. In contrast, among those adolescents who used alcohol, the level of alcohol consumption was reduced both by having a most important “hoped-for” self related to academics and having a rich constellation of hopes as goals. These findings suggest that feared (negative) and hoped-for (positive) possible selves may play different roles in adolescent drinking behaviors, with fears inhibiting involvement in alcohol use and hopes restraining the level of drinking once an adolescent is using alcohol. Researchers have suggested that positive possible selves function as resources to enable individuals to construct different strategies in response to challenges, whereas negative selves are developed to modify behaviors when one wants to change or become different (Markus, Cross, & Wurf, 1990; Markus & Wurf, 1987). Thus, positive possible selves may be more effective than negative possible selves for regulating behaviors (Markus et al., 1990). This may explain our finding that adolescents’ fears were more likely to be associated with use of any alcohol, while hopes were more likely to be associated with their level of alcohol consumption.

Academics was the most salient possible-selves domain and the domain that most powerfully influenced drinking behaviors. Academics was most frequently listed first (thus considered the most important content domain) on adolescents’ self-generated lists of hoped-for, feared, and expected possible selves. Other investigators similarly have shown that the majority of possible selves in high school adolescents fall in the domain of academics (Knox et al., 2000; Oyserman & Markus, 1990a). However, merely having an academic possible self anywhere in the possible-self repertoire did not predict alcohol consumption. Our results suggest that academics must be the most important content domain if it is to be protective against alcohol use and high levels of alcohol consumption in adolescents.

Our findings are consistent with those of a recent longitudinal study, in which adolescents with high levels of academic investment (e.g., participation in academic activities, academic plans, perceived importance of school, grades, and how much they liked school) in tenth to twelfth grades had less substance use (getting drunk, cigarette use, and marijuana) seven years later than did those with relatively low levels of academic investment in high school (Carlo, Crockett, Wilkinson, & Beal, 2011). In contrast to other studies of cognitions focused only on a single domain of alcohol use (e.g., alcohol expectancies, drinker prototype, or intention to drink), we found that self-cognitions in other domains, particular in academics, are protective against alcohol consumption in adolescents. We speculate that among adolescents whose most-important possible selves were related to academics, the time and energy invested in academic performance and related goals (Cross & Markus, 1994; Markus et al., 1990) may limit their involvement with alcohol.

Having many hopes for the self in the future was protective against alcohol use. Adolescents who had many hoped-for possible selves in eighth grade had lower levels of alcohol consumption in ninth grade. This finding is similar to previous evidence that positive possible selves may be protective against risk behaviors. For example, Aloise-Young et al.

(2001) found that the number of positive expected possible selves predicted lower levels of alcohol and tobacco use in sixth- to ninth-graders. Newberry and Duncan (2001) found that high school adolescents with lower levels of delinquent behaviors had more positive possible selves.

To our surprise, having a feared possible self as a drinker did not predict lower involvement in either drinking or level of consumption. Only a few adolescents spontaneously addressed drinking in their possible-self statements, and all those who did expressed fears. This could mean that adolescents were more comfortable acknowledging fears than hopes or expectations related to alcohol, or that feared drinker possible selves are more salient (and thus accessible in memory) than hoped-for or expected drinker possible selves. Furthermore, fears related to alcohol in this age group may not be strong enough to influence alcohol-use behaviors. However, investigators who focused on an expected drinker possible self (Corte & Szalacha, 2010; Quinlan et al., 2006), rather than a feared drinker possible self, demonstrated associations with drinking behavior. Moreover, the content of these feared drinker possible selves showed that at least some of the eight adolescents who spontaneously generated a feared drinker possible self had already been in trouble due to drinking or had a family member or friends who had trouble related to alcohol. This finding suggests that a feared drinker possible self may form as a result of negative personal or familial experiences with alcohol but does not necessarily limit alcohol-use behaviors in adolescents.

Taken together, our results support the view that adolescents who do not have sufficient opportunities to pursue academic goals or a variety of other positive interests may be more vulnerable to engaging in alcohol-use behaviors (Barber, Eccles, & Stone, 2001; Massey, Gebhardt, & Garnefski, 2008). Because possible selves are modifiable, interventions that reinforce the importance and personal relevance of academics and support opportunities for exploration and involvement in new activities may mitigate adolescent alcohol consumption.

Many empirically-supported adolescent alcohol prevention programs focus, at least in part, on intra-individual factors and include interventions to promote goal development (see Across Ages, SPORT Prevention Plus Wellness, and Active Parenting of Teens: Families in Action, in SAMHSA [2014] National Registry of Evidence-based Programs and Practices). Results of this study may be used to inform and strengthen those interventions in several ways. First, possible selves are highly-detailed, specific images of the self in the future that include behavioral routines and strategies. Interventions to foster goal development should include activities that promote detailed imaging of the self one “hopes to be in the future.” Examples of such interventions may include individual activities such as scrapbook development that encourage adolescents to gather and create images of the self they want to become in a specific behavioral domain (e.g., related to school, work or hobbies), and group activities in which adolescents describe aloud the kind of work they hope to be doing as an adult (see Oyserman et al., 2002, for related examples). In addition, opportunities for building skills needed to achieve possible selves should be included.

Second, goal-building for middle adolescents should focus on the creation of academic hoped-for and feared possible selves and address the barriers that prevent the adolescents from believing that the goals are realistic and achievable (see Oyserman et al., 2006).

Finally, our results showed that adolescents with more hoped-for possible selves engaged in lower levels of alcohol use, suggesting that involvement in extracurricular activities may be central to building a diverse array of hoped-for selves. Activities that include graduated stepping stones and self-competition (e.g., progression from junior varsity to varsity level teams, advancement from white belt to black belt in karate) may encourage development of highly personalized and achievable hoped-for possible selves.

The findings of this study should be considered in light of a few limitations. The original data were collected in the 1990s. However, given that the key domains of self-definition have remained stable over time (Knox et al., 2000; Mainwaring & Hallam, 2010; Oyserman & Markus, 1990a; Shapka & Keating, 2005), we deemed it likely that the self domains identified as protective against alcohol use are also stable over time. Gender was a significant covariate in regression models for the levels of alcohol consumption; girls were more likely to engage in higher levels of alcohol consumption, but our sample was not large enough to run separate models by gender to determine whether possible-self properties influenced alcohol use differently for boys and girls. The sample size also may have limited the confidence of our estimates in the complete model that included all predictors. Future studies with larger samples are needed to examine gender-specific models and to increase the precision of estimation. Finally, the majority of adolescents were Caucasian and from a working-class suburban community; thus, the findings may not be generalizable to more racially- and economically-diverse adolescents. Despite these limitations, our findings add important new knowledge about mechanisms contributing to adolescents' alcohol consumption, and in doing so open up new avenues to intervention.

Conclusion

This is the first report to our knowledge of the prospective effects of multiple properties of possible selves on adolescents' alcohol consumption patterns. Our findings add to the literature by showing that not only cognitions related to alcohol use behaviors contribute to alcohol use patterns in adolescents, but personalized future-oriented cognitions related to key domains (e.g., academics) play an important role. The findings suggest that to improve effectiveness, interventions that focus on the intra-individual factor of goal development should take into account adolescents' recent alcohol-use patterns. For adolescents who do not drink, reinforcing personalized fears related to academic performance may prevent the transition into alcohol use. For those adolescents who have a recent history of drinking, interventions to enhance the importance of academics and develop hoped-for possible selves in domains of interest and skill may reduce alcohol consumption levels.

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Table 1

Description of Alcohol Consumption and Properties of Possible Selves (N = 137)

	Mean (SD)	Minimum-Maximum
Level of alcohol consumption		
8 th grade drinks/week ^a	1.31 (4.1)	0.03–25.56
9 th grade drinks/week ^a	3.78 (10.0)	0.03–80.63
Properties of total array of possible selves		
Number of hoped-for possible selves	3.32 (0.9)	1–7
Number of feared possible selves	3.36 (1.0)	0–7
Number of expected possible selves	3.47 (1.1)	0–10
Number of balanced pairs of possible selves	1.01 (0.8)	0–3
Possible-self properties related to specific content domains		
	<i>n</i>	%
Feared drinker possible self	8	5.8
Most important hoped-for possible self related to academics	44	32.1
Most important feared possible self related to academics	35	25.5
Most important expected possible self related to academics	60	44.1

Note. SD= standard deviation

^aOnly for those adolescents who reported drinking (*n*=78 in 8th grade and *n*=91 in 9th grade).

Table 2

Correlations among Possible-Self Properties in Eighth Grade (N=137)

Variables	1.	2.	3.	4.	5.	6.	7.
1.Number of hoped-for possible selves	-						
2.Number of feared possible selves	.31**	-					
3.Number of expected possible selves	.26**	.37**	-				
4.Number of balanced possible selves pairs	.26**	.26**	.03	-			
5.Feared drinker possible self ^a	.15	.47**	.15	.07	-		
6.Most important hoped-for self related to academics ^a	-.02	.00	-.11	.25**	.03	-	
7.Most important feared self related to academics ^a	-.19*	-.09	-.10	.11	-.08	.10	-
8.Most important expected self related to academics ^a	.01	.11	.02	.02	.09	.18*	.09

Note. Spearman's Rho coefficient was used for two ordinal variables, phi coefficient was used for two dichotomous variables, and point-biserial coefficient was used for one dichotomous variable with one continuous variable.

^a 1=Yes, 0=No

* $p < .05$

** $p < .01$

Table 3

Predictors of Ninth-Graders' Alcohol Use and Level of Consumption in the Last 12 Months (N=137)

Predictors of Non-Use vs. Use of Alcohol	Exp(B)	95% CI
Gender ^a	1.92	0.68–5.37
8 th grade alcohol consumption ^b	0.11**	0.04–0.32
Number of hoped-for possible selves	1.97	0.97–4.03
Number of feared possible selves	1.04	0.58–1.87
Number of expected possible selves	0.83	0.51–1.32
Number of balanced pairs possible selves	0.83	0.40–1.71
Feared drinker possible self ^c	1.09	0.11–10.85
Most Important hoped-for possible self related to academics ^c	2.41	0.85–6.91
Most Important feared possible self related to academics ^c	3.35*	1.01–11.18
Most Important expected possible self related to academics ^c	1.13	0.41–3.10
Family structure ^d	1.45	0.52–4.10
Family cohesion ^e	0.77	0.28–2.18
Parental alcohol problems	0.42**	0.22–0.80
Perceived influence of friends	1.13	0.70–1.82
<hr/>		
Predictors of Level of Alcohol Consumption		
<hr/>		
Gender ^a	0.21**	0.10–0.45
8 th grade alcohol consumption	1.15**	1.04–1.27
Number of hoped-for possible selves	0.61*	0.39–0.97
Number of feared possible selves	1.23	0.78–1.93
Number of expected possible selves	1.17	0.79–1.76
Number of balanced pairs possible selves	1.27	0.75–2.13
Feared drinker possible self ^c	0.25	0.06–1.09
Most Important hoped-for possible self related to academics ^c	0.18**	0.08–0.45
Most Important feared possible self related to academics ^c	1.43	0.51–4.04
Most Important expected possible self related to academics ^c	0.75	0.31–1.82
Family structure ^d	0.20**	0.10–0.43
Family cohesion ^e	0.51	0.23–1.10
Parental alcohol problems	0.92	0.71–1.21
Perceived influence of friends	0.99	0.71–1.39

Note. Final zero-inflated gamma regression models with best fit are presented, including control variables (gender and 8th grade alcohol consumption in the last 12 months), social determinants (family structure, family cohesion, parental alcohol problems, and perceived friends' influence), numbers of possible selves, and academics-related possible selves. Alcohol non-use is reference category in first model above.

^a 1=Boy, 0=Girl

^b 1=Ever used, 0=Never used

^c 1=Yes, 0=No

^d 1=Two-parent, 0=Single-parent

^e 1=Effective, 0=Ineffective

*
 $p < .05$

**
 $p < .01$