

Adolescent Alcohol Use Is Common Psychoactive

Introduction

Adolescents are in the developmental stage of transition from childhood to adulthood, a stage during which they claim certain identities in favor of others and the resultant configuration of possible selves (Erikson, 1968, 1980; Marcia, 1966, 1980). The long-term studies of the Monitoring the Future (MTF) and the national Youth Risk Behavior Survey have reported that adolescent alcohol use is the common psychoactive substances in United States for a long time (Centers for Disease Control and Prevention, 2012; Johnston, O'Malley, Bachman, &Schulenberg, 2012). Many adolescents experiment with alcohol, but some progress to misuse and incur serious consequences. Adolescent problematic alcohol use associated with the various negative outcomes (e.g., violence, drunk driving, injuries, and risky sexual behavior) and also places them at risk for the leading causes of morbidity and mortality in adulthood. A more contemporary social cognitive model that focuses on the cognitive outcomes of identity development indicated that possible selves are cognitive structures that serve to regulate future behavior. The schema model of the self-concept in which cognitions about the self now (self-schemas) and in the future (possible selves) have been shown the power of regulating behavior. The modification of possible selves among adolescents may be an effective strategy to mitigate adolescent problematic alcohol use. Although many risk factors of problematic alcohol use have been identified, few factors that protect against problematic alcohol use are known. The purpose of this study was to determine whether the protective effects of having a most important hoped-for or feared possible self related to academics in 8th grade on level of alcohol consumption and alcohol misuse in 9th grade.

Possible selves, the individual's conceptions of what he/she hopes to become (hoped-for possible selves), expects to become (expected possible selves), and is afraid of becoming (feared possible selves), are the future-oriented components of the self-concept (Markus &Nurius, 1986). Possible selves are not simply and roughly wishes or concerns for the future; rather they are the aspects of consciousness that give meaning to the future for individuals (Markus &Ruvolo, 1989). This is because possible selves include vivid images of the self in the future state as well as strategies to achieve the possible self goal. Therefore, possible selves are important components of the self-system, helping to motivate an individual to process related knowledge for promoting self-regulation and influencing future behaviors (Cross & Markus, 1991; Markus &Nurius, 1986; Oyserman& James, 2009; Oyserman& Markus, 1990a; vanDellen& Hoyle, 2008). Indeed, possible selves may regulate adolescents' behaviors from the cognitive structure and serve as an incentive to guide their future actions (Cross & Markus, 1991; Hoyle & Sherrill, 2006; Markus &Nurius, 1986; Oyserman& Markus, 1990a; vanDellen& Hoyle, 2008).

Several aspects of possible selves have been shown to play a role in behavioral regulation (Aloise-Young, Hennigan, & Leong, 2001; Black, Stein, & Loveland-Cherry, 2001; Dark-Freudeman, West, & Viverito, 2006; Eshel & Kadouch-Kowalsky, 2003; Horneffer-Ginter, 2008; Oyserman, Bybee, Terry, & Hart-Johnson, 2004; Sosik, Jung, & Dinger, 2009), including balanced pairs of possible selves (Aloise-Young, et al., 2001; Black, et al., 2001; Oyserman, et al., 2004; Oyserman, Gant, & Ager, 1995; Oyserman & Markus, 1990a; Oyserman & Saltz, 1993; Seli, Dembo, & Crocker, 2009), specific content domains of possible selves (Oyserman, et al., 2004), and the most important (hoped-for or feared) possible self. However, the concept labels and the operational definitions of these aspects have tended to vary considerably across studies. Basic memory literature shows that the order of spontaneously generated items (e.g. self-descriptors) reflect accessibility in memory and relative importance (Towse, Cowan, Hitch, & Horton, 2008). The most important items are more accessible in memory and thus come to mind more frequently (Krosnick, 1989). Therefore, the possible self listed first in the response to open-ended probes of possible selves should reflect the most accessible, and therefore, the most important possible self. Studies (Hooker & Kaus, 1992; Oyserman & Saltz, 1993; Sobh, 2011) have demonstrated that the most important possible selves are powerfully linked to behaviors, such as health behavior, delinquency, and behavioral volitions. For example, Hooker & Kaus (1992) found that older adults who had a most important possible self related to health were more likely to have higher scores on health behavior (e.g., smoking, alcohol use, exercise, and weight control) than those without a most important possible self in the domain of health.

Self-schema

Self-schemas are affective-cognitive structures stored in long-term memory that reflect the current conceptions of the self (Markus, 1977; Markus & Ruvolo, 1989; Markus & Sentic, 1982; Stein, 1995). The array of self-schemas may provide an important context for the development of possible selves. Self-schemas are formed through interaction with the social environment in domains considered important to the individual (Cantor, Norem, Niedenthal, Langston, & Brower, 1987; Markus, 1977; Markus & Ruvolo, 1989; Stein, 1994). Self-schemas include semantic knowledge (abstract knowledge about the self), episodic knowledge (memories of specific behavioral experiences) and procedural knowledge (motoric skills and behavioral rules and strategies) (Fiske & Taylor, 2008; Kihlstrom, Beer, & Klein, 2005). They are chronically accessible and are used as a basis for judgments, decisions, inferences, or predictions about the self (Markus, 1977). For example, a person with a self-schema in a domain is more likely to pay attention to the schema related social stimulus and to use the schema to interpret and assign meaning to the event (Bargh, 1982; Higgins & King, 1981).

Many studies have shown that self-schemas also play a powerful role in regulating behavior (Andersen, Cyranowski, & Espindle, 1999; Corte & Stein, 2005; Cyranowski & Andersen, 1998; Garcia & Pintrich, 1994; Kendzierski, 1990; Kendzierski & Costello, 2004; Kendzierski & Whitaker, 1997; Markus & Wurf, 1987; Noureddine & Stein, 2009; Shadel, Niaura, & Abrams, 2000; Stein, 1994; Stein & Hedger, 1997). Positive self-

schemas (e.g., exerciser self-schema) stimulate the domain related behavior in and are associated with positive affect (Cross & Markus, 1994; Froming, Nasby, & McManus, 1998; Kendzierski, 1990), whereas negative self-schemas (e.g., shy self-schema) restrain the domain related behavior and are associated with negative affect (Cross & Markus, 1994; Shadel, et al., 2000). Thus, individual who has more positive self-schemas would have more motivation and strategies to accomplish the goal-directed behavior, but who has more negative self-schemas would have less motivation and strategies to attain the goal-directed behavior. Moreover, a prospective study among adolescents has shown that self-schema is a risk factor of alcohol use in adolescent, the number of negative self-schemas independently predicted earlier age of drinking onset whereas number of positive self-schemas modified the effects of antisocial behavior on early drunkenness (Corte & Zucker, 2008).

Adolescent alcohol use and risk factors

Adolescence is the time in which most adolescents start to experiment with alcohol use and other substance use. Adolescents at 13 to 14 years old (around 7th and 8th grades) are the peak years for the initiation of alcohol use and escalate between 16 and 20 years of age (Brown, et al., 2008; Chartier, Hesselbrock, & Hesselbrock, 2010; Faden, 2006). Early alcohol use in adolescence would cause not only the short-term risks/harms with alcohol but also long-term adverse consequences for developing various psychopathology and behavioral problems in the adulthood, especially adolescent problematic drinker (DeWit, Adlaf, Offord, & Ogborne, 2000; Huurre, et al., 2010; McGue & Iacono, 2005; Scheier, Botvin, & Baker, 1997; Trim, Meehan, King, & Chassin, 2007). Thus, it is critical to identify problematic drinking behavior and interfere in drinking behavior during adolescence.

There are many risk or protective factors of alcohol use have been showed in the previous studies (Hawkins, Catalano, & Miller, 1992; Huurre, et al., 2010; Nation & Heflinger, 2006; Schulenberg & Maggs, 2002), including personal factors and interpersonal environments (e.g., families and school/classrooms). Family factors include family content, family relations, parental and sibling influences, parental or sibling alcoholism, and parental psychopathology. Gender differences in risk factors for alcohol use initiation was also found (Donovan, 2004). For example, family structure was a marker of influencing the risk of problematic substance use (Barrett & Turner, 2006). Adolescents live in a single-parent household are more likely to have opportunity to experiment with alcohol or exhibit problem substance use and incur the later on substance use due to the less parental control compare to adolescents from two-parent homes (Barrett & Turner, 2006; Schulenberg & Maggs, 2002). Family conflict and low levels of cohesion were important predictors of alcohol use among middle school adolescents (Forgays, 1998). Moreover, parents and older siblings may influence adolescent alcohol use through modeling, approval of drinking, or provide access to alcohol (Donovan, 2004; Windle, 2000).

In addition, social influence from friends/peers, school performance, and psychology status in adolescents also explained the level of alcohol involvement (Nation & Heflinger, 2006; Scheier, et al., 1997; Schulenberg, Bachman, O'Malley, & Johnston, 1994). Studies have showed that social influence from friends/peers, peer relationships, and psychological risk (e.g., lack of behavioral control, high levels of depressive and anxious symptoms, and low self-esteem) influence on adolescent alcohol use and drinking behavior (Donovan, 2004; Nation & Heflinger, 2006; Scheier, et al., 1997). Adolescent's alcohol use also significantly correlated with the number of friends who were drinking (Wills, Sandy, Yaeger, Cleary, & Shinar, 2001). Education success (grade point average and college plans) in high school adolescents predicted lower alcohol use in three to four years of post-high school (Schulenberg, et al., 1994). For example, adolescents who had lower peer and friendship bonding, lower academic performance, and negatively perceived school climate are also predictors of initially alcohol use (Scheier & Newcomb, 1991). Moreover, high self-esteem and good decision-making skills can buffer some adolescents from the impact of peer influences (Scheier & Botvin, 1998).

However, some of risk or protective factors may be necessarily, but none of them can function alone sufficiently for particular outcomes. Also, there is no universal risk or protective factor, which is culturally embedded in the adolescent development (Merline, Jager, & Schulenberg, 2008; Scheier, et al., 1997; Schulenberg & Maggs, 2002). The risk factors of alcohol use in adolescence are more likely to interact with each other and develop the combined effects on adolescent alcohol use behavior (Chartier, et al., 2010). Thus, some of the factors (e.g., parental influence, peer influence, friend influence) may play significant role and have either protective or adverse effects depends on the individual's social contents.

The present research

The purpose of this study was twofold. First is to determine whether having a most important hoped-for or feared possible self related to academics in the 8th grade predicts lower level of total alcohol consumption and total alcohol misuse in 9th grade. Second is to determine whether having a most important hoped-for or feared possible self related to academics in the 8th grade mediates the effects of alcohol use risk factors on 9th grade level of total alcohol consumption and total alcohol misuse.

Method

A secondary data analysis of an existing longitudinal data of self-cognitions and a wide range of behaviors in adolescents across the transition from 8th to 9th grade was used. Data were initially collected in the winter semesters of the 8th (1992) and 9th grades (1993) in a single public junior high school in a suburban community. The data were collected through two stages. In the first stage, each adolescent had an individual interview during the school day in a designated room at the school, and complete the assent forms and the open-ended questionnaires of self-schemas and possible selves as well as the perceived social influence. Second stage was done three weeks later; an

in class group administration of self-reported questionnaires (e.g., alcohol use and misuse, family functioning, self-esteem, and sociodemographic information) was completed under the researchers' instructions and observations.

Participants

A total of 137 adolescents completed questionnaires in both 8th grade and 9th grade, including 68 males (49.6%) and 69 females (50.4%). Adolescents' mean age was $13.47 \pm .6$ years in the 8th grade and $14.45 \pm .6$ years in the 9th grade. The majority of adolescents are Caucasian (84.4%), followed by African American (12.6%) and others (3.0%).

Measures

2.1 Possible selves

The main predictor was presence of a most important hoped-for possible self related to academics and most important feared possible self related to academics. The open-ended probes (Oyserman & Markus, 1990a) were used to measure the participant's hoped-for possible selves and feared possible selves articulated in memory. Participants were asked to describe "what do you hope you will be like next year?" (hoped-for possible selves) and "what do you think about ways that things could go wrong for you in the next year?" (feared possible selves) for as many as they could think (at least 3 responses). The first listed for both hopes and fears would be considered as the most important hoped-for and the most important feared possible self separately. The most important hoped-for and feared possible selves were content coded into 25 domains. The top four content domains of the most important hoped-for possible self in 8th grade adolescents are academic achievement, conscientiousness, sport/exercise activities, and physical appearance. The top four content domains of the most important feared self in 8th grade adolescents are academic achievement, agreeableness, friendship, risky and behaviors. Since the academic achievement is the most frequently domain of both 8th grade adolescents' most important hoped-for possible self and feared possible self, the most important hoped-for possible self and most important feared self related to academics would be focused in the current study.

2.2 Risk factors of alcohol use

2.1.1 Self-schema

An open-ended card sorting task of "All About Me" (Stein, 1994) was used to elicit total collection of self-schemas available in memory, which was developed by Zajonc (1960) for measuring the cognitive structures. Participants were given a stack of blank index cards with alphabetical labeled and were asked to describe themselves by writing self-descriptive words or phrases on the index cards. Participants were instructed to write only one idea on each card (things they liked about themselves, things they didn't like

about themselves, and things they usually kept private) and encouraged to use as many/few as necessary to thoroughly describe themselves. Next, participants were asked to rate each self-descriptor in terms of its degree of descriptiveness and importance on an 11 point scale. Finally, participants were asked to indicate whether each self-descriptor was positive, negative, or neutral. According to Markus' methodology (1977), self-descriptors rated as both highly descriptive and highly important (8 or higher on descriptiveness and importance scales) were considered schematic for that characteristic. Self-descriptors that were subjectively rated as positive (or negative) and meet the criteria for a self-schema are considered positive (or negative) self-schemas.

2.1.2 Perceived social influence

The Social Influence Questionnaire, developed by Oyserman (1993) was used to assess the adolescents' perceived social influences from significant others. It is a self-report questionnaire that contains the following question "how important do you think they were in making you the way you are now?" for parents, brothers and sisters, teachers or schools, friends, and classmates separately. Responses are scored from 1 (not at all) to 5 (very).

2.1.3 Family functioning

Family Adaptability and Cohesion Scales (FACES II) was used to measure family functioning. FACES II is a 30-item self-report scale that contains two dimensions, cohesion (16 items) and adaptability (14 items) (Olson, 1982). Each statement offers a 5-point response which ranges from "almost never" (1) to "almost always" (5). Both dimensions of cohesion and adaptability include negative and positive items. Studies have showed the adequate reliability and validity of FACES II from a national survey of couples and families (Olson, 1982). In the present study, Cronbach alpha of the reliability for family cohesion was 0.86 and for family adaptability was 0.80. Moreover, four levels of family cohesion (i.e., disengaged, separated, connected, and enmeshed) and family adaptability (i.e., rigid, structured, flexible, and chaotic) were included within the Circumplex Model (Olson, 1982). Since studies have shown that the FACES II has a curvilinear relationship to family functioning as hypothesized by the Circumplex Model (Green, Harris, Forte, & Robinson, 1991; Olson, 1991; Olson & Gorall, 2003), optimal family functioning exists among families with moderate levels of cohesion and adaptability (Green, et al., 1991; Olson, 1982). Thus, the moderate levels of cohesion (i.e., separated and connected) and adaptability (i.e., flexible and structured) would be indicated as the "effective" family cohesion and family adaptability separately; and the highest/lowest levels of cohesion and adaptability would be indicated as the "ineffective" family cohesion and family adaptability separately.

2.1.4 Family structure

Family structure was measured by asking participants “who do you live with?” by the multiple choice questions. Based on their answers, family structure was dichotomized into “both parents involved” and “not both parents involved.”

2.1.5 Self-esteem

Rosenberg Self-Esteem Scale (SES) was used to assess global and unidimensional self-esteem among adolescents (Rosenberg, 1965). SES consists of 10-item self-report statements related to overall feelings of self-worth or self-acceptance. Participants were instructed to answer these statements according to how they generally feel about themselves. Responses were rated on a four-point scale ranging from strongly disagree (1) to strongly agree (4). Items Sum scores of the ratings assigned to all the items after reverse scoring the positively worded items. Higher scores indicated higher self-esteem. SES has demonstrated good reliability and validity across a large number of different sample groups (e.g., clinical groups of substance abusers, and general population) and has been shown to be a well-validated and reliable measure of global self-regard (Blascovich & Tonlaka, 1991; Robins, Hendin, & Trzesniewski, 2001). The alpha reliability in the present study was .83.

2.3 Alcohol consumption and alcohol misuse

Outcome variables included the level of total alcohol consumption and total alcohol misuse in the last 12 months in 9th grade. The frequency and quantity of alcohol use were measured by a self-report questionnaire, “Alcohol Use and Misuse Scale”, which was developed by Shope, Copeland, and Dielman (Shope, Copeland, & Dielman, 1994). The questions are asked about frequency and quantity for beer, wine, and hard liquor separately. Responses to the frequency were in five categories from “a few times a year or less” to “every day”. Responses to the quantity included six categories from “less than one can/bottle” to “seven or more cans/bottles”. The level of total alcohol consumption was the score of the average number of drinks per week, which was computed by the sum of the multiplying the frequency by quantity for three substances. The midpoint was used for the response categories that included a range, and the value of 7 was used as the maximum number of drinks per time. Moreover, alcohol misuse was measured by the 10 items, which are asked about frequency of various types of negative consequences experienced as a result of alcohol misuse in the past 12 months. The Cronbach alpha of the reliability for the total alcohol misuse in the present study was .73 in the 8th grade and .84 in the 9th grade.

Procedure of statistical analysis

The analyses were conducted with the Stata 12.0. The predictor variables of interest were presence of a most important ‘hoped-for’ possible self related to academics and a most important ‘feared’ possible self related to academics in the 8th grade. First, the

effects of the most important hoped-for or feared possible self on 9th grade level of total alcohol consumption/misuse were examined by Gamma regression with gender and 8th grade level of total alcohol consumption/misuse as control variables. Next, path analysis was used for assessing the direct and mediated effects of a most important hoped-for or feared possible self on 9th grade level of total alcohol consumption/misuse. Therefore, alcohol use risk factors, included self-schemas (positive and negative), self-esteem, family adaptability and cohesion, family structure, and social influences (parent, sibling, classmate, friend and teacher) were entered as other predictors. A most important hoped-for or feared possible self were treated as the mediators in the models. Gender and 8th grade alcohol consumption/misuse were still control variables. The fitness of the model was assessed with chi-square value, Comparative Fit Index (CFI), Incremental Fit Index (IFI), and Root Means Square Error of Approximation (RMSEA). The indirect effects were assessed by a bootstrapping method in path models of mediation (Preacher & Hayes, 2008). Bootstrapping is a non-parametric resampling procedure that does not assume normality of the sampling distribution from the available data set. The 95% confidence intervals are estimated for the indirect effects.

Result

The level of total alcohol consumption and total alcohol misuse significantly increased from 8th grade (consumption: $.75 \pm 3.2$; misuse: 10.76 ± 3.1) to 9th grade (consumption: 2.59 ± 8.4 ; misuse: 11.85 ± 4.5). Female adolescents had higher level of total alcohol consumption and total alcohol misuse than male in both 8th and 9th grades, especially the total alcohol misuse in the 9th grade ($p < .01$).

Among 137 adolescents, 32.1% adolescents listed the hoped-for possible self related to academics as the most important hope-for possible self and 25.6% adolescents listed the feared possible self related to academics as the most important feared self. First, the relationships between the 8th grade most important possible selves and 9th grade level of total alcohol consumption and total alcohol misuse after controlling gender and 8th grade level of total alcohol consumption and total alcohol misuse were estimated separately. Adolescents, especial female, who had a most important hope-for possible self ($B = -1.88$, $p < .01$) in the 8th grade predicted less level of total alcohol consumption in the next 12 months after controlling for the 8th grade level of alcohol consumption. Whereas, adolescents who had a most important hoped-for possible self related to academics in the 8th grade did not significantly predict the 9th grade total alcohol misuse in the past 12 months. On the other hand, adolescents who had a most important feared possible self related to academics in the 8th grade did not significantly predict the 9th level of total alcohol consumption in the past 12 months. However, adolescents, especially in female, who had a most important feared possible self related to academics in the 8th grade predicted less total alcohol misuse in the next 12 months ($B = -.11$, $p < .05$) after controlling for the 8th grade alcohol misuse.

Next, path analysis was used to examine the effects of having a most important possible self on 9th grade level of alcohol consumption and of having a most important

feared on 9th grade total alcohol misuse when the risk factors of alcohol use were added into the models, including family cohesion and adaptability, family structure, social influence (parents, siblings, teachers, friends, and classmates), positive and negative self-schema, and self-esteem. Gender and 8th grade level of total alcohol consumption or total alcohol misuse were the control variables in the path models.

The path model of the most important hoped-for possible self related to academics revised by the modification indices (as figure 1, $X^2=83.31$, $df=68$, $p=.10$) revealed an adequate model fit ($CFI=.93$, $IFI=.94$, and $RMSEA=.04$). The final model showed that the number of negative self-schema was negatively related to the most important hoped-for possible self related to academics ($\beta=-.25$, $p<.05$). Also, having a most important hoped-for possible self related to academics ($\beta=-.15$, $p<.05$), classmate influence ($\beta=-.20$, $p<.05$), family structure ($\beta=-.22$, $p<.01$) and the level of total alcohol consumption ($\beta=.59$, $p<.01$) in the 8th grade significantly predicted the 9th grade level of total alcohol consumption in the past 12 months. This model can explain 46.1% of variance on the 9th grade level of total alcohol consumption and the most important hoped-for possible self related to academics contributed 11.3% of variance on the 9th grade level of total alcohol consumption. In addition, the number of negative self-schema had adverse indirect effect ($p<.01$) and the parental influence had protective indirect effect ($p<.05$) on the 9th grade level of total alcohol consumption through the most important hoped-for possible self related to academic, which suggested that having a most important hoped-for possible self related to academics was a mediator for the relationships of the number of negative self-schema and parental influence with 9th grade level of total alcohol consumption. Adolescent who had more number of negative self-schema or who perceived less parental influences are more likely to have higher level of total alcohol consumption in the following year. Whereas, the fitting model for the sample data showed that a most important feared possible self related to academics did not significantly predict the 9th grade level of total alcohol consumption in the past 12 months. Therefore, having a most important feared possible self related to academics was not a mediator for the relationships of alcohol risk factors with 9th grade level of total alcohol consumption.

On the other hand, the fitting model for the sample data showed that the most important hoped-for possible self related to academics did not significantly predict the 9th grade total alcohol misuse in the past 12 months. Thus, having a most important hoped-for possible self related to academics did not mediate the relationship of alcohol risk factors with 9th grade total alcohol misuse in the past 12 months. However, having a most important feared possible self related to academics in the 8th grade significantly predicted the 9th grade total alcohol misuse in the past 12 months. This model was revised by the modification indices (as figure 2, $X^2=83.27$, $df=68$, $p=.10$). The fit indices values for the CFI, IFI, and RMSEA were .94 .95, and .04, respectively, which indicated an adequate model fit. The final model showed that parental influence positively related to the most important feared possible self related to academics ($\beta=.17$, $p<.05$). Also, the most important feared possible self related to academics ($\beta=-.14$, $p<.05$), family structure ($\beta=-.14$, $p<.05$), and the total alcohol misuse ($\beta=.67$, $p<.01$) in the 8th grade

significantly predicted the 9th grade total alcohol misuse in the past 12 months. This model can explain 52.4% of variance on the 9th grade total alcohol misuse and the most important feared possible self related to academics contributed 10.5% of variance on the 9th grade total alcohol misuse. In addition, family cohesion ($p < .05$) and parental influence ($p < .05$) had protective indirect effects on the 9th grade total alcohol misuse, but the number of positive self-schema ($p < .05$) had positively indirect effects on the 9th grade total alcohol misuse through the most important feared possible self related to academics. These suggested that the most important feared possible self related to academic was a mediator for the relationships of family cohesion, parental influence, and the number of positive self-schema with 9th grade total alcohol misuse. Adolescents who had ineffective family cohesion, perceived less parental influence, or had more positive self-schema are more likely to have more total alcohol misuse in the following year.

Discussion

This study sample had higher prevalence of the last month alcohol use in 8th graders and lifetime alcohol use in 9th graders than the findings in the national survey of Monitoring the Future in 1992 (Johnston, et al., 2012) and the findings in the national Youth Risk Behavior Survey in 1993 (Centers for Disease Control and Prevention, 1993). Moreover, female had higher prevalence of both level of total alcohol consumption and total alcohol misuse than male in the 9th grade among these adolescents, which is different to the common prevalence of alcohol use (i.e., male had higher prevalence of alcohol use than female) in adolescents.

From the social cognitive theoretical perspective, adolescents are most likely to develop possible selves in the content domains of their current social environments (e.g., home, school, and peers), personal experiences, or life task, because the different content domains of possible selves generated appeared to reflect the major concern of the social roles and relationships in the specific age range (Cross & Markus, 1991; Knox, Funk, Elliott, & Bush, 2000; Lee & Oyserman, 2009; Markus, 1977; Markus & Nurius, 1986; Oyserman & Fryberg, 2006; Oyserman, et al., 1995; Oyserman & Markus, 1990a, 1990b; Vignoles, Manzi, Regalia, Jemmolo, & Scabini, 2008). Studies have shown that the majority of high school adolescents' possible selves fall in the domain of academic achievement, relationship, and occupation (Knox, et al., 2000; Oyserman & Markus, 1990a). In the current study, adolescents' highest frequent domain of both the most important hoped-for and feared possible self is academics, which was consistent with the literature and did not have difference between male and female adolescents.

Moreover, studies showed that possible selves shift in response to feedback either about individual's own likely success in achieving the possible self (Kerpelman & Pittman, 2001) or other examples success and failure in attaining the possible self (Kemmelmeier & Oyserman, 2001). Kerpelman and Pittman's study (2001) showed that the importance of possible selves in undergraduate adolescents remained stable or changed in response to feedback given the presence and behavior of a peer. This is

because adolescents engage in identity exploration of highly important possible selves when the similar conditions occur in the presence of the peer partners. However, in contrast with classmates/peers/friends influences, this study showed that parental influence, family structure (whether live with biological parents), and self-schema had more effects on the adolescent's most important hoped-for and feared possible self.

In order to clarify if the possible selves related to academics must be the most important possible self or if it has the same function to regular alcohol use behavior once adolescent has at least one of possible self related to academic, we have examined if any possible self related academics in anywhere of adolescent's hoped-for and feared possible self repertoires in the 8th grade predicted the level of total alcohol consumption and total alcohol misuse in the 9th grade. The results showed that possible self related academics in anywhere of adolescent's possible self repertoires in the 8th grade did not significantly predict both level of total alcohol consumption and total alcohol misuse. These results and the current study's findings suggested that having a possible self related to academics could only work for predicting 9th grade level of total alcohol consumption or total alcohol misuse when it is a "most important possible self" for adolescent himself/herself.

Previous study has showed that the risk factors of alcohol use in adolescence may interact with each other and the protective or adverse effects of specific factor on adolescent alcohol use behavior may vary by adolescent's social context (Chartier, et al., 2010). This study also revealed similar findings of alcohol use risk factors. Thus, the specific risk factors may not always represent either the protective or adverse effects on adolescent alcohol use as the general expected. Also, which specific factor could have the relative strong influence on adolescent alcohol use would also depend on the interaction of all potential factors of alcohol use. For example, both family and school are the major social environments for adolescents. However, one of influence from parents, friends, peers, or classmates may have stronger effects on adolescent alcohol use than others depend on the situations of individual's family and school environment. Thus, the specific alcohol use risk factor was difficult to distinguish from the combined effects on alcohol use behavior. Since the mediator effects of "the most important possible self related to academics" on the relationships between alcohol use risk factors and the level of total alcohol consumption/alcohol misuse have determined in this study, the possible selves focused intervention would be the efficient strategy for regulating adolescent's alcohol use behavior.

In addition, possible selves emerge within the context of the total collection of self-schemas (Markus & Nurius, 1986, 1987; Oyserman & Markus, 1993). The existing self-schemas may facilitate attainment of possible selves in the same domain as the self-schemas, because a future self (possible self) derives from past and present representations of self (self-schemas) and incorporates the future representations of self (Markus & Nurius, 1986, 1987; Markus & Ruvolo, 1989; Oyserman & Markus, 1990b). In the current study, even if self-schema have showed the significantly indirect effects on the level of alcohol consumption and alcohol misuse, the relationship of the number

of self-schema (both positive and negative) on possible selves and their effects on adolescent alcohol consumption/misuse were not quite clear. It may be because that the simple counting of the total number of positive and negative self-schemas are not domain specific, which may mix up the effects of self-schema from different content domains. However, if the possible selves and self-schemas are linked together in a specific content domain, which contains related knowledge and strategies, the individual's performance will be more effective to achieve the domain specific goal (Oyserman & Markus, 1990b; Stein, 1995). Thus, further studies are needed to clarify the relationships between self-schema and possible selves in the given content domain.

In addition, there are a couple of limitations in this study as follows. First, the majority of participants were Caucasian (83%) and from a working class suburban community, the results may not be easily generalized to more ethnically diverse populations or those of higher or lower social classes. Future studies are needed to assess the role of the most important possible selves related to academics on the level of alcohol consumption and alcohol misuse in ethnically diverse samples and who are members of other social classes. Second, the original study was completed in the 1990s, so there may be a concern about the age of the dataset. However, the variables that we examined are not particularly time sensitive. They are likely to be as pertinent today as they were in the 1990s. More contemporary studies could be done to validate the findings of the secondary analysis of data.

Conclusion

Having the most important 'hoped for' possible self in the academic domain was protective against alcohol use in adolescents. In future studies, interventions should target development of or elaboration of 'hoped for' possible selves related to academics.