



Self-concept disturbances: Cognitive vulnerability for early drinking and early drunkenness in adolescents at high risk for alcohol problems [☆]

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ABSTRACT

We tested the hypotheses that adolescents with few positive and many negative self-schemas would drink and get drunk earlier than adolescents with many positive and few negative self-schemas. Adolescents ($N=264$) from an ongoing prospective family study of alcoholism [Zucker, R. A., Fitzgerald, H., Refior, S., Puttler, L., Pallas, D., & Ellis, D. (2000). The clinical and social ecology of childhood for children of alcoholics: Description of a study and implications for a differentiated social policy. In H. Fitzgerald, B. Lester, & B. Zuckerman (Eds.), *Children of addiction: Research, health, and policy issues* (pp. 109–141). New York, NY: Routledge Falmer] were assessed at ages 12 to 14 and again at ages 15 to 17. When considering the combined effects of the number of positive and negative self-schemas, antisociality, and parental alcoholism on drinking outcomes, the number of negative self-schemas directly predicted early drinking onset, whereas the number of positive self-schemas moderated the effects of antisociality on early drunkenness. Moreover, although self-concept properties at baseline did not differentiate level of alcohol involvement at follow-up in mid-adolescence, they did distinguish earlier from later age of onset among those who initiated, with effects tending to be somewhat stronger for boys than girls. Self-schemas appear to be an additional risk factor in the pathway to problem alcohol involvement in adolescence, above and beyond the contributions of such known risk factors as antisocial behavior and parental alcoholism.

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1. Background

Alcohol use and misuse among adolescents is a significant public health problem. Alcohol—the drug of choice among youth—is a leading contributor to injury-related deaths in persons under 21 (Institute of Medicine, 2004). Youth who drink before 15 years of age also have a four-times higher risk of developing alcohol dependence later in life than those who onset to drinking at or after age 15 (Grant & Dawson, 1997). Furthermore, there are some suggestions from recent work that alcohol use may cause long-term structural and functional changes in the developing brains of adolescents (Brown & Tapert, 2004; Monti et al., 2005). Beyond the risks for adolescents, there are also widespread collateral effects on families and communities. These startling statistics suggest an urgent need to identify modifiable risk factors for early alcohol use so that effective interventions can be developed to prevent early alcohol use and misuse.

Two key risk factors for early maladaptive alcohol use—antisociality and family history of alcoholism—are not easily modifiable, and as such, it is important to identify factors that moderate the effects of these risk factors that may be more

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amenable to change. Data from our previous research with young adults suggests that a self-concept comprised of *few positive and many negative domains of self-definition* may moderate the effects of antisociality and familial alcoholism. We found that such a self-concept configuration distinguished young adults with antisocial alcohol dependence from social drinking controls and those in recovery and predicted high levels of alcohol use (Corte & Stein, 2007). Because these young adults already had alcohol dependence, it is not clear whether having few positive and many negative self-schemas in fact moderated the effects of high antisociality and familial alcohol problems, thus contributing to early maladaptive alcohol use, and ultimately, the development of alcohol dependence. That is, the cross-sectional finding may have been correlational rather than causative.

The present study fills this gap. We seek to determine whether a self-concept comprised of few positive and many negative domains of self-definition independently predicts or moderates the effects of antisociality and parental alcoholism on early drinking onset and early drunkenness in adolescents across time. Data come from the adolescent participants in the Michigan Longitudinal Study, an ongoing prospective family study of alcoholism and other drug use disorders (Zucker et al., 2000). Specifically, using a cognitive model to conceptualize the self-concept (Markus & Wurf, 1987), we tested whether the number of positive and negative domains of self-definition (called self-schemas) in early adolescence independently predicted or moderated the effects of antisociality and parental alcoholism on four drinking outcomes three years later: (onset of drinking by age 15–17 [yes/no], age of onset [if yes], drunk by age 15–17 [yes/no], and age of first drunk episode [if yes]). In addition, we also compared the predictive ability of positive and negative self-schemas to global self-esteem. To our knowledge, this is the first cognitively based prospective investigation of the role of self-concept in alcohol use and misuse in adolescence.

1.1. Self-concept in adolescence

Self-concept formation is the major developmental task of adolescence (Erikson, 1968). The consequences of failing to establish a clearly defined set of identities may lead adolescents to engage in maladaptive behavior as a way to define themselves, i.e., to determine 'who one is.' Being uncertain about 'who one is' has been found to be associated with other maladaptive behaviors in adolescents, such as smoking (Denscombe, 2001). While other researchers have suggested that self-concept disturbances may be an important vulnerability for alcohol use in adolescents (DuBois & Silverthorn, 2004; Swaim & Wayman, 2004; Wills, Walker, Mendoza, & AINETTE, 2006), they have not focused on the underlying structure of the self-concept. This may be important given previous work that showed specific disturbances in the underlying structural properties of the self-concept in young adults with alcohol dependence (Corte & Stein, 2007).

1.2. Cognitive model of self-concept

According to the cognitive model, the self-concept is comprised of a diverse collection of elaborated cognitive structures about the self that are referred to as self-schemas, and other less fully developed conceptions of the self (Sedikides & Skowronski, 1997). Self-schemas are formed through social experience in a variety of domains including those involving physical attributes, social roles, values, attitudes, interests, and activities (Markus & Wurf, 1987). Neuroimaging studies have shown that self-schemas are neural pathways that are stored in long-term memory and reflect domains of expertise and personal relevance (Lieberman, Jarcho, & Satpute, 2004; Macrae, Moran, Heatherton, Banfield, & Kelley, 2004).

Self-schemas play an important role in behavior, but positive and negative self-schemas have different emotional and behavioral consequences. Positive self-schemas *motivate* behavior in the domain (Cross & Markus, 1994; Kendzierski, 1990). For example, Froming, Nasby, and McManus (1998) found that children with a prosocial self-schema donated more tokens to classmates compared to their counterparts who did not have a prosocial self-schema. In contrast, negative self-schemas *inhibit* behavior in the domain (Cyranowski & Andersen, 1998; Wurf, 1988). For example, Andersen and Cyranowski (1994) found that women with a negative sexual self-schema had fewer romantic partners and were generally more avoidant about sex than women with a positive sexual self-schema or women with no sexual self-schema. Negative self-schemas may in turn motivate maladaptive behavior in an effort to escape discomfort stemming from the negativity (Baumeister, 1990). From this perspective, positive self-schemas may be viewed as cognitive resources and negative self-schemas may be viewed as cognitive liabilities.

From the perspective of the cognitive model, adolescents with *few positive and many negative self-schemas* would have insufficient internal motivation and behavioral strategies necessary to facilitate adaptive goal-directed behavior. In addition, the lack of a clear and stable sense of self and a sense of uncertainty about 'who one is' that stems from such a self-concept configuration (Campbell, 1990) may motivate maladaptive behavior as a means of establishing an identity and escaping the discomfort associated with the negativity. In contrast, adolescents with *many positive and few negative self-schemas* would have a clear and stable sense of self, a sense of certainty about 'who they are,' and adequate internal motivation and the behavioral strategies necessary to facilitate adaptive goal-directed behavior.

Self-esteem is an overall evaluation of the self (Swann, Chang-Schneider, & McLarty, 2007) that stems from the underlying structural properties of the self, i.e., self-schemas. As such, self-schemas should be associated with self-esteem, but not proxies for self-esteem. Swann and colleagues argue that because self-esteem represents a global attitude toward the self, it is a better predictor of global or bundled outcomes, e.g., adult adaptation, rather than specific outcomes, e.g. drinking behavior. Therefore, we predicted that self-esteem would not have the same degree of predictive ability as the number of positive and negative self-schemas.

1.3. Application of cognitive model to youth with antisociality and parental alcohol problems

There are theoretical reasons to posit that adolescents with antisociality and parental alcoholism may have few positive self-schemas and many negative self-schemas. The chaotic home environment often associated with parental alcoholism (Zucker et al., 2000) may limit opportunities for children to explore their social environments from a very young age, thus limiting the development of positive self-schemas. Furthermore, because of the impulsivity associated with antisociality, such youth may have difficulty persisting at music lessons, sports activities, hobbies, etc., for long enough or with enough regularity to form positive self-schemas in these domains. In addition, the negative feedback such adolescents receive from their persistent pattern of rule violations, aggression, deception, theft, and destruction of property, is likely to lead to the formation of many negative self-schemas. In the context of antisociality and parental alcohol problems, alcohol use is a likely 'solution' to the discomfort associated with a self-concept comprised of few positive and many negative self-schemas. Taken together, we propose that having few positive and many negative self-schemas may independently predict or moderate the effects of two known risk factors for alcohol problems—antisociality and parental alcoholism—on early drinking and drunkenness.

More specifically, we predicted that: (1) adolescents with few positive and many negative self-schemas in early adolescence (12–14 years) would be more likely to drink and get drunk by mid-adolescence (15–17 years) than those with many positive and few negative self-schemas, (2) for adolescents who reported drinking (and getting drunk) by mid-adolescence (15–17 years), those with few positive and many negative self-schemas would do so earlier than those with many positive and few negative self-schemas, and (3) the number of positive and negative self-schemas included in the self-concept in early adolescence (12–14 years) would independently predict or moderate the effects of antisociality and parental alcoholism on drinking outcomes thereafter (in mid-adolescence). Furthermore, we predicted that positive and negative self-schemas would have more predictive power than global self-esteem.

In addition to these formal hypotheses, given the substantial differences in rates of problem alcohol involvement for boys and girls, as an exploratory question we examined whether gender interacted with these self self-schema relationships in determining level of alcohol involvement.

2. Method

2.1. Participants

Participants were adolescents from families taking part in an ongoing prospective family study of alcoholism and other substance use disorders (Zucker et al., 2000). In the initial study, the presence of paternal alcoholism in a substantial subset of the families ensured that the latter to be adolescents would be at higher risk for the development of alcohol problems. Families were recruited for the initial study based on presence or absence of an alcohol abuse/dependence diagnosis in the father. Some families were recruited through a four countywide court system after a drunk driving conviction of the father involving a blood alcohol concentration of at least 0.15% (0.12% if there was a previous drinking-related conviction) ($n = 146$; 48% of families). Other criteria for participation included having a son between 3 and 5 years of age and living with the biological mother of the son at the time of enrollment in the study. Control families ($n = 95$; 32% of families) and additional families with a father with alcohol abuse/dependence ($n = 61$; 20% of families) were identified using community canvassing in the same neighborhoods as the court-recruited alcoholic men. In all families with an alcoholic father, alcohol abuse/dependence in the mother was free to vary; among control families mothers as well as fathers had to be free of any substance use disorder throughout their lives. Siblings who were +/- 8 years of the primary male target child also participated in the study. A more detailed description of recruitment strategies and eligibility criteria can be found in Zucker et al. (2000).

Only those adolescents who had complete data on self-concept, antisociality, and drinking-related outcomes at both baseline (12–14 years) and mid-adolescence (15–17 years) (Waves 4 and 5 of the larger longitudinal study) were included in the analyses (total $N = 264$). Because of the criteria for study inclusion, the majority of the adolescents (73.5%; $n = 194$) were boys. Mean age at baseline was 13.3 ± 0.9 years. This was indeed a high-risk sample in that the majority (67.4%) had a positive history of parental alcohol use disorder based on a DSM-IV diagnosis of alcohol abuse or dependence in either the father or the mother at one or more time points since the child was 3–5 years of age (Family Study baseline).

2.2. Measures

2.2.1. Parental alcoholism

The Diagnostic Interview Schedule (DIS; Robins et al., 2000), the Short-Michigan Alcohol Screening Test (SMAST; Selzer, 1975) and the Drinking and Drug History Questionnaire (DDHQ; Zucker, Noll, & Fitzgerald, 1988) were used to assess the presence or absence of alcohol abuse or dependence in the father and the mother at waves 1, 2, 3, and 4 (at any time point in the child's life). A trained clinician used information from these three instruments to establish the presence or absence of a DSM-IV alcohol abuse or dependence diagnosis in the previous three years at each data collection wave. These three instruments were administered in three different data collection sessions sometimes several months apart. In cases where data from the different instruments was discrepant, the data represented by the majority of the instruments were used to establish the diagnosis. As noted above, for the purpose of this secondary analysis of data, a positive DSM-IV alcohol abuse or dependence diagnosis in either the mother or the father at any time point in the child's life (from 3–5 years of age) was considered positive for parental alcohol problems.

2.2.2. Antisociality

Extent of antisocial behavior in the adolescent in early adolescence (12–14 years) was measured with the Antisocial Behavior Checklist-Youth (Zucker & Fitzgerald, 1996). This 63-item questionnaire assesses the frequency of aggressive and antisocial activities (e.g., getting into fights, skipping school, and shoplifting) in earlier childhood as well as adolescence. Responses include 0=never (never in last 3 years), 1=rarely (1–2 times), 2=sometimes (3–9 times), and 3=often (10 or more times). Scores were summed across items with higher scores reflecting higher antisociality. Cronbach's alpha was .93.

2.2.3. Number of positive and negative self-schemas

The number of positive and negative self-schemas included in the self-concept in early adolescence (age 12–14) was measured using the number of positive or negative items endorsed as “really true for me” from the Harter Self-Perception Profile for Adolescents (Harter, 1985). This 45-item questionnaire measures competence in a variety of domains including school, athletics, social acceptance, physical appearance, behavioral conduct, romance, job, and friends. Each item has a positive pole and a negative pole (e.g., some teenagers have a lot of friends, BUT other teenagers don't have very many friends); items are counterbalanced. This structured alternative format implies that some teenagers view themselves one way, whereas other teenagers view themselves in the opposite way, thus legitimizing both responses. The adolescent first chooses which kind of teenager is most like him/her (i.e., positive pole or negative pole), and then decides whether this is “sort of true” or “really true” for him/her. Positive (or negative) items endorsed as “really true for me” were considered positive (or negative) self-schemas because such endorsements suggest certainty or clarity about one's competence in the domain. Certainty and clarity have been used as indicators of the underlying structure of the self-concept (Baumgardner, 1990; Campbell, 1990; Campbell & Lavalley, 1993). Items endorsed as “sort of true for me” reflect a lack of certainty or clarity about one's competence in the domain, and as such, were not counted as self-schemas. Five items that measure global self-worth were not included in the computation of the number of positive and negative self-schemas because they reflect one's general attitude toward the self rather than competence in a specific domain. This left a total of 40 possible self-schemas.

In another study using this same method to compute the number of positive and negative self-schemas, youth who had few positive and many negative self-schemas had significantly lower self-concept clarity (33.6 versus 39.8, $p=.002$) than youth who had many positive and few negative self-schemas providing evidence of construct validity (Corte, 2007a). In that study, one year stability was $r=.75$ for the number of positive self-schemas and $r=.80$ for the number of negative self-schemas. In the present sample, three-year stability for the number of positive self-schemas was $r=.43$ and for the number of negative self-schemas was $r=.36$ offering support for the measure as an indicator of self-structure over time.

Because self-schemas are formed in domains that are considered personally meaningful, it should be noted that perceived importance of the self-concept domains was not measured in this study. However, in other work with youth in which self-schemas were computed both with and without taking perceived importance into consideration, we found high correlations for both positive ($r=.56$), and negative ($r=.80$) self-schemas (Corte, 2007b). There is also some evidence that youth tend to discount the importance of domains in which they feel they are not competent (Harter & Whitesell, 1999), suggesting that among youth, extreme ratings (“really true for me”) are likely to reflect domains of importance, i.e., self-schemas.

2.2.4. Self-esteem

The five-item global self-worth subscale of the Harter Self-Perception Profile for Adolescents (Harter, 1985) was used to measure global self-esteem, an overall self-evaluation, in early adolescence (12–14 years). This subscale has been widely used to measure self-esteem of adolescents. Cronbach's alpha for the global self-worth subscale for the present sample was .80.

2.2.5. Drinking outcomes

Four drinking outcomes in mid-adolescence (15–17 years) were measured with the Drinking and Drug History Questionnaire for Youth (DDHQ-Youth) (Zucker et al., 1988). The first two outcomes were whether or not the adolescent drank [not counting sips given by an adult] or got drunk by mid-adolescence (yes/no). The other outcomes were age of first drink (for those who reported drinking) and age of first drunk episode (for those who reported getting drunk).

2.3. Procedure

Data were collected every three years on all family members including the adolescents in this report. The ASB-Youth, Harter Self-Perception Profile, and the DDHQ-Youth were administered in the same session. As indicated earlier, only those with complete data on all relevant variables at both baseline and follow-up were included in the analyses. This led to exclusion of 38% of Ss from the original sample. Comparisons between these two groups on familial alcoholism, antisociality, and positive self-schemas in early adolescence where these data were available showed no differences. However, those excluded had more negative self-schemas in early adolescence [2.8 versus 2.1, $t(302)=2.0$, $p=.04$]. Because the sample was truncated on self-schemas, it is likely that the results would be even stronger in a non-attenuated sample (Little, 1992).

3. Results

Because nearly 45% of the sample consisted of sibling pairs, the assumption of independence was violated. To estimate the effect of this non-independence, we used a rule of thumb based on a Monte Carlo study suggested by Muthen and colleagues (Muthen, 2000; Muthen & Satorra, 1995). The rule states that the design effect of <2 is considered acceptable and small enough to

Table 1

Descriptive statistics for self-concept variables and antisociality in early adolescence (12–14 years) and drinking outcomes in mid-adolescence (15–17 years) by parental alcoholism (AUD) status and gender controlling for age at assessment

	Parental AUD positive (n = 173)	Parental AUD negative (n = 85)	Boys (n = 190)	Girls (n = 68)
<i>Early adolescence (12–14 years)</i>				
Antisocial behavior score	11.1 (12.7)	7.7 (6.7)	10.7 (11.9)	8.1 (8.9)
# Positive self-schemas	14.4 (8.4)	15.3 (8.0)	14.7 (8.5)	14.6 (7.8)
# Negative self-schemas	2.2 (3.4)	1.9 (2.8)	2.1 (3.2)	2.2 (3.2)
Global self-esteem	16.4 (2.9)	16.9 (2.7)	16.7 (2.7)	16.0 (3.3)
<i>Mid-adolescence (15–17 years)</i>				
Drink by FU	66.7%	51.2%	61.2%	62.9%
Age 1st drink (years)	13.5 (2.2)	14.2 (1.4)	13.4 (2.4)	14.1 (0.9)
Drunk by FU	74.2%	59.1%	66.7%	79.5%
Age 1st drunk (years)	14.2 (1.9)	14.8 (1.6)	14.1 (2.0)	14.8 (1.1)

Note. Bold text indicates significant between parental alcoholism group differences and/or gender differences ($p \leq .05$). FU = follow-up.

be ignored. The design effect was estimated as $d = 1 + \rho(c - 1)$, where ρ is the intraclass correlation and c is the common cluster size (Muthen, 2000). For the 264 children in 206 families, the common cluster size in our dataset was 1.29. Even when the intraclass correlations on the dependent variables were equal to 1, the design effect would be less than 2. Thus, the lack of independence in our data due to siblings (up to two in most cases with 3 siblings in two families) did not significantly bias our analysis. As a check on the effect of violation of independence, we also completed the analyses using just the oldest child in the family and the results held.

Descriptive statistics for baseline risk factor variables in early adolescence (12–14 years) and drinking variables three years later (15–17 years) are shown in Table 1. Because of age differences within data collection waves (12–14 at baseline and 15–17 at follow-up), age was included as a covariate in all analyses. First, we compared youth with and without parental alcoholism (left side of Table 1). A MANOVA with parental alcoholism (positive/negative) as a between-groups factor was completed to examine differences in antisociality and self-concept variables (number of positive self-schemas, number of negative self-schemas, and self-esteem). Antisociality was significantly higher for adolescents with (versus without) parental alcoholism ($F = 6.16, p = .01$), but there were no differences in any of the self-concept variables for adolescents with or without parental alcoholism ($F_s \leq 1.65, p_s \geq .16$). Loglinear analyses with parental alcoholism (positive/negative) as a factor were completed for the percentage of adolescents experiencing drinking onset (yes/no) and drunkenness (yes/no) by follow-up (15–17 years). More adolescents with (versus without) parental alcoholism drank (67% versus 51%, $\chi^2 = 5.92, p = .02$) and got drunk (74% versus 59%, $\chi^2 = 3.49, p = .06$) by mid-adolescence (15–17 years). ANOVAs were completed for age of drinking onset (for the subset of adolescents who reported drinking) and age of first drunk episode (for the subset of adolescents who reported getting drunk). Among those who did drink and get drunk, there was a non-significant trend for those with parental alcoholism to do so earlier than those without parental alcoholism, $F_s \geq 9.0, p_s = .08$.

On the right side of Table 1, gender differences in these variables are shown. To examine gender differences, the same pattern of analyses were conducted but with gender as a between-groups factor. There were no gender differences in antisociality or number of positive or negative self-schemas ($F_s \leq 1.63, p_s \geq .20$), but boys tended to have slightly higher self-esteem ($F = 3.40, p = .07$) compared to girls. While there were no gender differences in terms of whether or not adolescents drank ($\chi^2 < 1, p = .81$) or got drunk ($\chi^2 = 2.55, p = .11$), among those who did, boys tended to do so earlier than girls ($F_s \geq 11.17, p_s \leq .001$).

3.1. Creating vulnerable and healthy self-concept groups

In order to compare drinking outcomes in mid-adolescence (15–17 years) for adolescents who had few positive and many negative self-schemas with those who had more many positive and few negative self-schemas, we formed two groups based on median splits of the number of positive self-schemas and the number of negative self-schemas in early adolescence (12–14 years). Adolescents with few positive and many negative self-schemas (at or below the median for positive self-schemas and at or above the median for negative self-schemas) were considered to have a *vulnerable self-concept* ($n = 97$); all other Ss were considered to have a *healthy self-concept* ($n = 167$). We also completed a more stringent test of our hypotheses by restricting our healthy self-concept group to only those adolescents who had both many positive self-schemas and few negative self-schemas (deleting those in the intermediate groups—those with many positive and many negative self-schemas and those with few positive and few negative self-schemas). Because the results were unchanged, we present analyses on the entire sample. There were no differences in age (13.4 ± 0.9 versus 13.3 ± 0.9 years) for the vulnerable and healthy self-concept groups, $t < 1, p = .50$. Thirty-nine percent of the boys and 46% of the girls were in the vulnerable self-concept group, $\chi^2(3, N = 264) = 4.4, p = .23$.

To test the hypotheses that adolescents with few positive and many negative self-schemas (vulnerable self-concept) in early adolescence would be more likely to drink and get drunk three years later than those who had many positive and few negative self-schemas (healthy self-concept) in early adolescence, loglinear analyses were completed. Because we were also interested in the effects of gender, the vulnerable and healthy self-concept groups were divided by gender such that the independent variable had four cells—boys with a vulnerable self-concept, girls with a vulnerable self-concept, boys with a healthy self-concept, and girls with a healthy self-concept. The dependent variables were ever drinking by mid-adolescence (yes/no) and ever getting drunk by mid-adolescence (yes/no); age at assessment was included as a covariate. Contrary to predictions, no differences were found between

Table 2

Drinking outcomes in mid-adolescence for boys and girls with vulnerable or healthy self-concepts in early adolescence controlling for age at assessment

	Vulnerable self-concept boys (n=68)	Vulnerable self-concept girls (n=29)	Healthy self-concept boys (n=126)	Healthy self-concept girls (n=167)
% Drink by FU	66	62	60	63
Age 1st drink (years)	12.3	14.4	14.0	14.5
% Drunk by FU	67	78	67	81
Age 1st drunk (years)	13.3	14.9	14.4	15.4

the vulnerable and healthy self-concept groups in terms of *whether or not* adolescents drank ($\chi^2 < 1, p = .83$) or got drunk ($\chi^2 = 2.6, p = .46$) three years later, regardless of gender (see the first and third rows of Table 2).

To test the hypotheses that among adolescents who reported drinking and getting drunk, those who had few positive and many negative self-schemas (vulnerable self-concept) in early adolescence would do so earlier than those who had many positive and few negative self-schemas (healthy self-concept) in early adolescence, ANOVAs with two between-groups factors (self-concept group and gender) were completed. Age at assessment was included as a covariate. In the analysis to predict age of first drink among those adolescents who reported ever drinking, both self-concept group and gender were significant factors. Among youth who reported drinking, those with a vulnerable self-concept initiated drinking significantly earlier than did those with a more healthy self-concept, $F(1,154) = 6.6, p = .01$, and boys drank earlier than girls, $F(1,154) = 19.9, p = .026$. A significant self-concept group \times gender interaction, $F(1,154) = 5.10, p = .03$, revealed that boys with a vulnerable self-concept initiated drinking 1.7 years earlier than boys with a more healthy self-concept and over two years earlier than girls, regardless of their self-concept configuration. In the analysis to predict age of first drunk episode among those adolescents who reported ever getting drunk, only self-concept group and gender were significant. Those with a vulnerable self-concept had their first drunkenness experience 9.6 months earlier on average than those with a more healthy self-concept, $F(1,110) = 6.1, p = .015$. Boys got drunk 1.3 years earlier on average than girls regardless of self-concept configuration, $F(1,110) = 14.7, p < .001$ (see second and fourth rows of Table 2).

3.2. Positive and negative self-schemas as predictors of risk for alcohol problems

Multiple regression analyses were completed to test the hypothesis that the number of positive and negative self-schemas at baseline (12–14 years) predicts or moderates the effects of known risk factors for alcohol problems (antisociality and parental alcoholism) on the age of drinking onset and age of first drunk episode for those who report drinking by mid-adolescence. For both analyses, predictor variables included the number of positive and negative self-schemas at baseline, antisocial behavior score at baseline, dummy variables for parental alcoholism (0=no, 1=yes) and gender (0=girl, 1=boy), and age at assessment. All 2-way interaction terms were entered in the second block. A summary of the regression analyses is presented in Table 3. For clarity of presentation, only the main effects and significant interactions are shown.

The model to predict age of drinking onset among those adolescents who reported drinking was significant, ($p < .001$, top row of Table 3). The number of negative self-schemas independently predicted earlier age of drinking onset ($p = .03$), but the number of positive self-schemas was not a significant predictor ($p = .38$) or moderator ($ps > .13$). Being male ($p = .004$) and having a higher level of antisociality ($p = .001$) also independently predicted age of onset. Parental alcoholism was not a significant predictor ($p = .46$) with the other variables in the model, nor were there any significant interactions.

The model to predict age of first drunk episode among those adolescents who reported getting drunk was also significant, ($p < .001$, second row of Table 3). Results showed that being male ($p = .001$) and having high antisociality predicted earlier drunkenness ($p = .001$), but the latter was qualified by a positive self-schema \times antisociality interaction effect ($p = .01$). An examination of the model coefficients shows that positive self-schemas buffered the effect of antisociality on age of first drunk episode; those with positive self-schemas tended to get drunk at a later age.

3.3. Self-esteem as a predictor of risk for alcohol problems

To compare the predictive power of self-esteem with that of positive and negative self-schemas, regression analyses were again completed, but self-esteem was used as a predictor instead of positive and negative self-schemas (bottom half of Table 3). Dependent variables were age of drinking onset (for those who reported drinking) and age of first drunk episode (for those who reported getting drunk). In the analysis to predict age of drinking onset, the model was significant ($p < .001$), but neither self-esteem ($p = .15$) nor interactions with self-esteem ($ps \geq .08$) were significant predictors. In the analysis to predict age of first drunk episode, the model was significant, ($p < .001$). Self-esteem was not an independent predictor of age of first drunk episode ($p = .99$), but here also, there was a significant self-esteem \times antisociality interaction ($p = .03$). An examination of the model coefficients shows that having high self-esteem buffered the effects of antisociality on age of first drunkenness.

3.4. Summary of findings

A self-concept comprised of few positive and many negative self-schemas did not distinguish *whether* drinking onset or drunkenness occurred, but rather *how rapidly* it occurred developmentally. That is, among those who reported drinking and those

Table 3

Regression analyses using self-schemas (top half) and self-esteem (bottom half) to predict age of drinking onset and age of first drunk episode

Dependent variable predictors	B	SE B	β
<i>Age of drinking onset</i>			
Step 1			
Age at assessment	1.08	.20	.41*
# Positive self-schemas	.02	.02	.06
# Negative self-schemas	-.10	.05	-.16*
Parental alcoholism (0=no; 1=yes)	-.28	.37	-.05
Antisociality	-.04	.01	-.25*
Gender (0=female; 1=male)	-1.09	.37	-.22*
Significant interactions at step 2			
None	-	-	-
$R^2 = .25, F(6,148)=8.23, p<.001$			
<i>Age of first drunk episode</i>			
Step 1			
Age at assessment	1.10	.19	.51*
# Positive self-schemas	.01	.02	.03
# Negative self-schemas	-.03	.04	-.05
Parental alcoholism (0=no; 1=yes)	-.31	.37	-.07
Antisociality	-.04	.01	-.30*
Gender (0=female; 1=male)	-1.15	.34	-.29*
Significant interactions at step 2			
# Positive self-schemas \times antisociality	.004	.002	.64*
$R^2 = .39, F(16,94)=3.7, p<.001$			
<i>Age of first drink</i>			
Step 1			
Age at assessment	1.12	.20	.42*
Self-esteem	.08	.06	.11
Parental alcoholism (0=no; 1=yes)	-.36	.37	-.07
Antisociality	-.04	.01	-.25*
Gender (0=female; 1=male)	-1.16	.38	-.23*
Significant interactions at step 2			
None	-	-	-
$R^2 = .23, F(5,149)=8.8, p<.001$			
<i>Age of first drunk episode</i>			
Step 1			
Age at assessment	1.13	.19	.52*
Self-esteem	.00	.05	.00
Parental alcoholism (0=no; 1=yes)	-.35	.36	-.08
Antisociality	-.04	.01	-.31*
Gender (0=female; 1=male)	-1.15	.34	-.29*
Significant interactions at step 2			
Self-esteem \times antisociality	.007	.003	.89*
$R^2 = .38, F(10,100)=6.1, p<.001$			

Note. * $ps \leq .05$.

reporting getting drunk, having a self-concept comprised of few positive and many negative self-schemas distinguished those who did so earlier from those who did so later, and these effects were generally stronger for boys than girls. When considering the combined effects of self-concept disturbances, antisociality, and parental alcoholism on age of first drink and age of first drunk episode, the number of negative self-schemas independently predicted age of drinking onset, whereas positive self-schemas buffered the effects of antisociality on early drunkenness. Self-esteem was not a significant predictor of age of first drink. Like positive self-schemas, self-esteem buffered the effects of antisociality on timing of drunkenness onset.

4. Discussion

Consistent with the results of national survey data (Johnston, O'Malley, Bachman, & Schulenberg, 2005), the majority of adolescents in our sample had experienced drinking onset by 15–17 years of age, and the majority of those who drank also reported that they had gotten drunk at least once. We note that it was the presence of a familial risk factor—parental alcoholism—not the presence of an individual risk factor—self-concept disturbances in early adolescence—that distinguished youth who moved into a problem drinking pathway (drinking initiation and drunkenness initiation) by middle adolescence from those who did not. However, among those youth who did move into this problem alcohol involvement pathway, having few positive and many negative self-schemas in early adolescence distinguished earlier from later age of initiation of these problems (drinking and getting drunk), and these effects were generally stronger for boys than girls. This is an important finding because it is only those adolescents who drink (the majority by 15–17 years of age) who are at risk for alcohol-related problems. As such, having few

positive and many negative self-schemas in early adolescence may be viewed as a cognitive vulnerability for early maladaptive alcohol use for adolescents who drink, particularly for adolescent boys.

In our analyses to parse the combined effects of self-concept disturbances, known risk factors for alcoholism, and gender, we found that the number of negative self-schemas included in the self-concept in early adolescence directly predicted early drinking onset. The finding that boys with high antisociality tend to have early drinking onset is not surprising (see Zucker, 2006). The observation that negative self-schemas independently contribute to early drinking onset in adolescents above and beyond the effects of antisociality and parental alcoholism is a new finding, and one that has important direct implications for intervention. Because early drinking onset is itself a risk factor for the later development of alcohol problems (Grant & Dawson, 1997) interventions aimed at delaying drinking onset may profitably focus on dampening negative schemas, and fostering the development of positive self-schemas.

While negative self-schemas predicted early drinking onset, positive self-schemas moderated the effects of antisociality on early drunkenness. High antisociality is a known risk factor for alcohol problems (Bonomo, Bowes, Coffey, Carlin, & Patton, 2004; Knop et al., 2003; Marmorstein & Iacono, 2005; Maguin, Zucker, & Fitzgerald, 1995), but these findings suggest that this is true only for adolescents who have few positive self-schemas. For adolescents who have many positive self-schemas, antisociality appears to involve another matrix that does not confer risk. Rather, positive self-schemas serve as a protective factor while negative self-schemas serve as a risk factor for early drunkenness. Together these findings also indicate that preventive interventions may profitably focus on fostering the development of positive self-schemas as well as limiting the development of negative self-schemas.

Although positive and negative self-schemas were somewhat better than global self-esteem at predicting drinking outcomes, the effect appears to be a small one. More specifically, the number of negative self-schemas predicted rapidity of onset of first drinking among adolescents who reported drinking, but self-esteem did not (the effect difference was not present in predicting drunkenness onset). These findings are consistent with Swann and colleagues' argument that self-concept researchers should match the specificity of the predictor with the specificity of the criterion (Swann et al., 2007). Because self-esteem reflects an overall attitude toward the self, it may be better suited to predicting global outcomes rather than specific outcomes. Our findings that the underlying structural properties of the self-concept (the number of positive and negative self-schemas) are somewhat better than self-esteem at predicting drinking outcomes generally supports this position.

Some special features of these findings also warrant comment. One is the question of why results were stronger for boys than girls. One obvious possibility for the difference in results is that the analyses on girls were underpowered, given that the female *n* was less than one third as large as the male *n*. To evaluate this issue, we conducted separate post-hoc power analyses for boys and girls to determine if power was different. Power to detect effects of age of drinking and/or drunkenness initiation was only .35/.36 in girls. If we had the same number of girls as we had boys, our power to detect these effects would be .89 and .87 respectively, suggesting that the observed sex differences in our models are attributable more to power differences than to true sex differences in the relationship.

A second issue is why self-concept variations predicted rapidity of alcohol problem involvement but *not* whether or not the onset of such problems occurred. Among all the adolescents in our sample, having a self-concept comprised of few positive and many negative self-schemas only exerted an influence in the subset who reported drinking, i.e., those at the higher end of the drinking risk spectrum. Similarly, among those adolescents who reported any drinking, such a vulnerable self-concept configuration only exerted an influence in the subset who reported getting drunk, i.e., again among those at the highest end of the risk spectrum. It would appear that these self-schemas in some way accelerate the transition to the next-step, more risky drinking. This vulnerability only comes into play among those at the higher end of the drinking/drunkenness risk spectrum.

A third issue is one of mechanism; that is, how do these self-concept deficits in fact mediate the adolescent's alcohol involvement? We note that parental alcoholism is a familial characteristic that conveys both genetic and socialization risk. Antisociality is a behavioral characteristic, and self-schemas are cognitive characteristics. Given that cognitions have motivational characteristics in the guidance and direction of behavior (Goldman, 2002) but are not a proxy for behavior, it is plausible that both cognitive and behavioral characteristics contribute to drinking outcomes. Familial risk is a third level influence on this process.

4.1. Strengths and limitations

To our knowledge, this was the first study to use a cognitive model of the self-concept to examine the predictive ability of self-concept disturbances on later alcohol use and misuse in adolescents. Other strengths include the high-risk sample of adolescents and the longitudinal study design. Limitations include the lack of diversity in the sample making it difficult to generalize these findings to non-Caucasian adolescents.

4.2. Conclusions

A self-concept comprised of few positive and many negative self-schemas may be an important modifiable risk factor for early alcohol use and early drunkenness. Negative self-schemas confer risk for early drinking onset, and among boys with high antisociality who have few positive self-schemas, early drunkenness. Of particular note, antisociality appears to confer risk only in those adolescents who have few positive self-schemas. Having many positive self-schemas appears to serve as a protective factor to delay the onset of drunkenness among adolescents who drink. Taken together, these findings suggest that interventions aimed at fostering the development of a healthy self-concept—one comprised of many positive and few negative self-schemas—may delay drinking onset and early drunkenness.

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