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Investigating Drinking via the Social Investment Hypothesis: Committed Relationship Status Moderates the Association between Educational Investment and Excessive Alcohol Consumption among College Students

Tim Bogg

Indiana University, Bloomington

Abstract

A sample of 18- to 23-year-old college students ($N = 183$) with a heterogeneous prevalence of alcohol dependence (AD) was used to examine the relationship between normative investment and alcohol consumption. Consistent with the social investment hypothesis, AD students reported lower educational investment and less participation in committed relationships than non-AD students. The sample-wide relationship between educational investment and alcohol use was moderated by relationship status, such that students in relationships who reported high educational investment were likely to drink more than single students who reported high educational investment. This interactive effect held when controlling for sex, IQ, and a measure of self-control. The results suggest normative investment is a candidate risk factor for excessive alcohol consumption for both highly “under-committed” and “over-committed” students.

1. Introduction

Excessive alcohol consumption continues to be one of the most prevalent health and social problems on U.S. college campuses. Among 18- to 24-year-old students, deleterious outcomes associated with excessive drinking include poor academic performance, unsafe sex, vandalism, injuries, assaults, sexual abuse, and death (Hingson et al., 2005). A large body of research has identified a number of individual difference factors associated with excessive alcohol consumption, alcohol-related problems, and lifetime diagnoses of alcohol abuse and dependence. These factors include personality traits related to impulsivity and self-control, as well as cognitive abilities, such as intelligence and working memory (Bogg & Roberts, 2004; Finn et al., 2009).

The current study seeks to build upon these associations via an account of normative social investment. Normative social investment is defined as investment and commitment to adult social roles (Roberts & Wood, 2006; Roberts, Wood, & Smith, 2005). These roles are primarily related to work/career (collegian, employee, etc.), family (romantic partner, spouse, parent, etc.), and community (civic, volunteer, religious, etc.). Engaging in adult roles is expected in young adulthood, and earlier or later entry into many of these domains is non-normative (Helson et al., 2002; Helson, Mitchell, & Moane, 1984; Neugarten, Moore, &

Correspondence should be addressed to: Tim Bogg, Department of Psychological and Brain Sciences, Indiana University, 1101 E. 10th St., Bloomington, IN 47405, USA, Tel.: + 1 317 374 1031, fax: + 1 812 855 4691, tdbogg@gmail.com (T. Bogg).

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Lowe, 1965; Roberts, Wood, & Smith, 2005). In conjunction with established individual difference predictors of alcohol consumption, two prominent domains of the intellectual and social lives of college students are examined herein—subjective educational investment and committed relationship status.

1.1. The social investment hypothesis and excessive alcohol consumption

The aims of the present study are guided by the social investment hypothesis, which posits that individual differences in development are influenced by the acquisition of and commitment to normative (and often age-graded) social roles (Helson et al., 2002; Roberts & Wood, 2006). The mechanisms of social investment's effects on development are rooted in the contingencies associated with the successful adoption and maintenance of these roles. For example, becoming a successful long-term romantic partner requires reliability, impulse control, involvement, and commitment, among other factors. Unreliable, impulsive, uninvolved, and uncommitted partners are 'punished' to the extent that they engender negative emotions and other reactions that signal dissatisfaction and a failure to meet the expectations for a 'good' partner. Conversely, meeting these expectations engenders increased intimacy and relationship satisfaction—positive contingencies that reinforce normative behaviors. Similarly, becoming a successful college student requires many of the same attributes as that of a romantic partner. When a student meets these expectations, they receive positive contingencies (e.g., better grades, progress toward a degree, parental approval, etc.) that reinforce normative tendencies. Among college students, excessive alcohol use might be associated with normative investment to the extent that it is disruptive or inhibitive of successful role adoption or role maintenance.

Research on excessive alcohol use among college students is generally bereft of evidence supporting or disconfirming the social investment hypothesis, or the influence of normative role participation, more generally. However, a recent study of 1,621 college students found those in committed relationships drank less often and were less likely to binge drink (Braithwaite, Delevi, & Fincham, 2010), providing some support for the contention that participation in a committed romantic relationship is negatively associated with excessive alcohol consumption. As with committed relationship status, subjective educational investment/involvement (i.e., how committed, obligated, or responsible a college student feels toward that role) has not been a target of focused inquiry in relation to excessive alcohol consumption. Although not identical to subjective educational investment, a related construct—studying expectancies—was examined in a sample of college students (Levy & Earleywine, 2003). Studying expectancies were operationalized as ratings of beliefs about “the potential personal gain inherent in studying, earning a college degree, and maintaining a high GPA” (p. 553). The results showed that, among students with high positive alcohol expectancies, those students who also had high studying expectancies drank less and had significantly fewer drinking problems than those students who had low studying expectancies.

The findings of these two studies provide initial support for the relationship between normative social investment and excessive alcohol consumption. However, these studies examined committed relationship and student roles in isolation from one another. Moreover, the studies fail to account for the influence of important individual difference factors, such as traits related to impulsivity and self-control, or cognitive abilities, such as intelligence and working memory, which have shown consistent relations with excessive alcohol consumption in young adult samples. The current investigation augments these previous findings by examining both committed relationship status and subjective educational investment and by incorporating relevant individual difference control variables.

1.2. The present study

The current study investigated the incremental predictive utility of subjective educational investment (i.e., self-reported commitment to and involvement in the student role) and committed relationship status as markers of normative investment, controlling for relations with established personality trait and cognitive ability predictors of alcohol consumption. Previous meta-analytic research showed the personality trait of self-control to be the strongest conscientiousness-related correlate of excessive alcohol use (Bogg & Roberts, 2004). A separate line of research investigating a similar role for cognitive abilities showed intelligence and working memory were independent contributors to alcohol and co-morbid externalizing problems, including marijuana, other drug problems, and conduct and antisocial personality problems (Finn et al., 2009). Recent research integrated and extended these findings by showing a latent behavioral disinhibition factor—indicated by conscientiousness-related traits and alcohol and co-morbid externalizing problems—retained independent relations with measures of intelligence and working memory (Bogg & Finn, 2010). Taken together, these findings suggest the conscientiousness-related trait of self-control and the cognitive abilities of intelligence and working memory represent a coherent set of individual difference predictors of alcohol consumption and related externalizing problems, especially among late adolescent samples.

Although the primary outcome of interest is excessive alcohol consumption, differences in committed relationship participation and subjective educational investment based on alcohol dependence status are examined as a complement and extension of previous research, which, to date, has only focused on alcohol consumption (i.e., Braithwaite, Delevi, & Fincham, 2010; Levy & Earleywine, 2003). Based on this previous work and the social investment hypothesis, it was expected that students meeting diagnostic criteria for alcohol dependence would report less educational investment and a lower frequency of committed relationship participation than students who do not meet diagnostic criteria for alcohol dependence.

Sample-wide analyses are used to investigate relations between committed relationship status, subjective educational investment, and excessive alcohol consumption. In contrast with previous work, the effects of committed relationship status and subjective educational investment are examined in a single design. This introduces the possibility of role conflict or role competition, whereby two or more roles, to various degrees, present incompatible demands (e.g., Kahn et al., 1964; Rothbard & Edwards, 2003). Although no research to date has examined the relationship between normative role conflict and alcohol consumption in college students, research using adult samples has identified a relationship between adult role conflict and excessive alcohol consumption, especially in relation to employment and home life roles. Specifically, Frone, Russell, and Barnes (1996) found work-family conflict to predict heavy alcohol use in two studies of employed men and women with at least one child living at home, controlling for several demographic variables, including sex and education.

In the current study, role conflict is examined as an interactive effect of committed relationship status and subjective educational investment on recent alcohol use. Specifically, it is expected that students who: a) are in a committed relationship, *or* b) report high subjective educational investment, should report the least amount of recent alcohol use. Conversely, students who: a) are not in a committed relationship, *or* b) report low subjective educational investment, should report the greatest levels of recent alcohol use. Students who are in a committed relationship, but who also report high subjective educational investment should report a moderate level of recent alcohol use, owing to the increased possibility of role conflict or competition (i.e., being less able to respond to all the contingencies of romantic partner and student roles). Students who are in a committed relationship, but who report low subjective educational investment should experience less role conflict and report

less recent alcohol use than those students who are in relationships and report high subjective educational investment.

2. Method

2.1. Participants

2.1.1. Recruitment—Participants were recruited through flyers around the university (including residence halls), advertisements placed in the student newspaper, as well as a Web-based university classified advertisement system. The range of flyers/advertisements included those asking for responses from “a more reserved and introverted type of person,” “subjects interested in psychological research,” “daring, adventurous people who have led exciting and impulsive lives,” “impulsive, daring people who have led exciting and carefree lives,” males and females “who only drink modest amounts of alcohol,” “people who are heavy alcohol drinkers,” and “people who abuse alcohol.” The ads and flyers were designed to attract respondents that represented a range of levels of disinhibited tendencies and alcohol use. This approach has been very effective in attracting responses from participants who vary in personality traits related to self-control, as well as attracting alcohol dependent participants (Bauer & Hesselbrock, 1993; Widom, 1977).

2.1.2. Study exclusion criteria—Participants were excluded from the study if they [1] were not between 18 and 23 years of age, [2] could not read and/or speak English, [3] had never consumed alcohol, [4] reported having suffered from any serious head injuries, [5] had a history of psychosis, and [6] were not currently enrolled in post-secondary coursework (i.e., college/university classes).

2.1.3. Group inclusion/exclusion criteria—The inclusion criteria for non-AD participants were [1] not meeting any DSM-IV criteria for a lifetime history of alcohol dependence (AD), childhood conduct disorder, antisocial personality (ASP), or any other substance dependence, [2] not using marijuana more than 4 times in the last 6 months and not using any other mood altering drug at all in the last 6 months, [3] not using marijuana more than 15 times in their life, and [4] not using other mood altering drugs recreationally more than 4 times in their life. If a participant failed to meet any one of the criteria, then he/she was excluded from further participation. The goal for the non-AD participants was to screen for a reasonable number of disorders so that they would be relatively diagnosis-free, not only alcohol-dependence-free. The inclusion criterion for the AD group was meeting DSM-IV criteria for a history of AD. Participants were not excluded from the AD group if they had current or past other substance dependence.

2.1.4. Test session exclusion criteria—At the beginning of the assessment session, participants were asked about alcohol and drug use in the past 12 hours, the number of hours of sleep during the previous night, the most recent meal, and were given a breath alcohol test using an AlcoSensor IV (Intoximeters, Inc., St. Louis, MO). Participants were rescheduled if their breath alcohol level was greater than 0.000 %, if they reported consuming any drug within the past 12 hours, if they reported feeling hung-over, or if they reported or appeared to be impaired, high, overly sleepy, or if they were unable to answer questions.

2.1.5. Sample characteristics—The sample ($N = 183$) was evenly distributed among women (50.3 %) and men and had a mean age of 19.83 years ($SD = 1.30$ years). Most participants were European-American/Caucasian (77 %), followed by Asian/Asian-American (6.6 %), Hispanic (6.6 %), African-American (6.0 %), Other (2.7 %), and Native American (1.1 %). Less than half of the sample met diagnostic criteria for alcohol

dependence (47 %). The vast majority of students were undergraduates (92.9 %). The remainder was graduate students (7.1 %).

2.2. Assessment materials and procedure

2.2.1. Recent alcohol use interview—For each day of the past two weeks, participants reported whether they consumed alcohol and, if so, the amount they consumed, and the timeframe of consumption for each drinking session. Alcohol use was quantified as the total number of standard drinks consumed over the past two weeks (alcohol quantity), the number of days of consumption over the past two weeks (alcohol frequency), and the number of hours of reported alcohol consumption over the past two weeks (alcohol duration). According to skewness and kurtosis diagnostic tests, the alcohol use variables deviated from normality by small amounts. However, Blom transformations (which reduced skewness and kurtosis close to zero) of the alcohol use variables resulted in the same statistically significant ($p < .05$) pattern of results. As a result, and especially to aid in interpretation, the raw consumption scores are used in the reported analyses.

2.2.2. Diagnostic interview—Diagnoses of alcohol dependence (AD), childhood conduct disorder (CCD), adult antisocial personality, marijuana dependence, and other drug dependence were determined using the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA; Bucholz et al., 1994) which uses criteria from the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (DSM-IV; American Psychiatric Association, 1994).

2.2.3. Intelligence—Intelligence was measured using the Shipley Institute of Living Scale estimates of IQ (Zachary, 1986). The Shipley is a self-administered measure of intelligence that strongly correlates (median correlation = .79) with the WAIS Full Scale IQ (Zachary, 1986).

2.2.4. Working memory capacity—Working memory functions of dual task ability, divided attention, and maintenance capacity were assessed with the Auditory Consonant Trigram test (ACT; Brown, 1958). The ACT was modified to include four and five nonsensical strings of consonants, in addition to the original three-string stimuli to increase the overall load on the working memory system. The dependent variable is the number of correct consonants recalled across all string lengths and delay intervals.

2.2.5. Self-control—The Control subscale of the Multidimensional Personality Questionnaire (MPQ) was used to assess self-control (Tellegen, 1982). The MPQ control scale is comprised of 24 items (e.g., “When faced with a decision I usually take time to consider and weigh all aspects.”) using a dichotomous response scale (i.e., “true” or “false”; $\alpha = .92$).

2.2.6. Educational investment and committed relationship status—Subjective educational investment was assessed with 5 items adapted from a measure of family involvement (Misra, Ghosh, & Kanungo, 1990) and 2 items developed by Lodi-Smith (2007). The seven-item scale assessed commitment and involvement in education and the student role (e.g., “I am very much involved personally in my schooling/education,” “I feel a strong sense of obligation toward my education,” “Most of my personal life goals are education-oriented”) using a five-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). The subjective educational investment scale demonstrated strong internal consistency ($\alpha = .85$). Relationship status was assessed with an item assessing status as “single,” “in a committed relationship (e.g., boyfriend/girlfriend),” “married,” “separated,”

or “divorced.” Only those students responding to “single” or “in a committed relationship (e.g., boyfriend/girlfriend)” were included in the analyses.

2.2.7. Procedure—Participants first provided written consent to participate. In a private assessment room, trained experimenters administered the recent alcohol use interview, the diagnostic interview, and the working memory task. Participants were then instructed to complete a demographic questionnaire, as well as the measures of intelligence, self-control, and subjective educational investment. Total time of assessment ranged from one and a half to two and a half hours. Participants were compensated at \$10/hr.

2.3. Analyses

Independent samples *t* tests were used to examine differences between the AD and non-AD groups for the cognitive ability, self-control, subjective educational investment, committed relationship status, and recent alcohol use variables. Group differences in the frequency of committed relationship status also are reported. Sample-wide correlational analyses were subsequently used to examine the magnitude of the relationships among the Shipley IQ, working memory, MPQ control, subjective educational investment variables and the recent alcohol use variables. Finally, hierarchical multiple regression was used to examine the incremental predictive validity associated with subjective educational investment and committed relationship status, as well as the interaction of these variables in the prediction of recent alcohol use.

3. Results

3.1. AD versus non-AD group differences

Consistent with expectations, the AD group scored significantly lower on Shipley IQ, MPQ control, subjective educational investment, and committed relationship status ($p < .05$; see Table 1). In contrast, there was no group difference for working memory. More generally, Table 1 shows the recruitment strategy was successful in attracting participants who varied in levels of self-control and alcohol consumption.

3.2. Sample-wide correlations for recent alcohol use

Table 2 displays the bivariate relations among the IQ, working memory, MPQ control, subjective educational investment variables and the recent alcohol use variables. As expected, students scoring lower on Shipley IQ, MPQ control, and subjective educational investment were more likely to report greater quantity, frequency, and duration of alcohol consumption in the past two weeks ($p < .05$). Working memory capacity was not significantly correlated with quantity, frequency, or duration of alcohol consumption.

3.3. Testing the moderating effect of subjective educational investment and committed relationship status on recent alcohol use

Hierarchical multiple regression analyses were used to test the incremental and moderating effects of subjective educational investment and committed relationship status on recent alcohol use. Independent samples *t* tests showed men consumed more drinks, on average, than women [$t(181) = 2.10, p < .05$], but men did not drink more frequently than women [$t(181) = .58, p > .05$] or for a longer duration [$t(181) = 1.05, p > .05$]. As a result, all models for quantity of consumption control for the effects of sex. Following the guidelines of Aiken and West (1991), scores for all non-binary predictor variables were referenced to the normal distribution and *z*-scored. Sex was scored 0 = male, 1 = female. Committed relationship status was scored 0 = single, 1 = in a committed relationship. In each of the models, Shipley IQ and MPQ control (and sex, for the quantity models) were entered first,

then subjective educational investment and committed relationship status, and finally the multiplicative term for subjective educational investment and committed relationship status.

As can be seen in the Step 3 models in Table 3 and panels A–C of Figure 1, subjective educational investment and committed relationship status produced significant multiplicative effects on the drink quantity, frequency, and duration variables ($p < .05$). Specifically, single students who reported low subjective educational investment drank nearly twice as much as students who reported low subjective educational investment and were in committed relationships. Single students who reported low subjective educational investment drank one additional day more than students who reported low subjective educational investment and were in committed relationships. Single students who reported low subjective educational investment drank six hours more than students who reported low subjective educational investment and were in committed relationships. Consistent with the possibility of role conflict, single students who reported high subjective educational investment reported less alcohol use than students who reported high subjective educational investment and were in committed relationships. Single students who reported high subjective educational investment and students in committed relationships who reported low subjective educational investment reported the lowest amounts of alcohol use.

4. Discussion

Using the social investment hypothesis as a framework, the current study examined the relationship between two domains of normative investment and excessive alcohol consumption in a sample of college students. Consistent with previous work (Braithwaite, Delevi, & Fincham, 2010; Levy & Earleywine, 2003), the results provide initial support for the contention that higher levels of normative investment should be associated with less recent alcohol use. To be clear, the results present a nuanced picture of the influences of committed relationship status and subjective educational investment. In line with the idea that major life roles can often create competition or conflict for finite psychological resources, the roles interacted in a way that suggests it may be less optimal, from the perspective of alcohol consumption, to be overly devoted to being a student and also be in a committed relationship. These findings are somewhat analogous to those found in a study of work-family conflict and heavy alcohol use among employed men and women with at least one child living at home (Frone, Russell, & Barnes, 1996). However, more research is needed to explicitly determine the influence of role conflict in the moderated prediction of recent alcohol use from committed relationship status and subjective educational investment. For example, the moderated relationship found in the current study might be further moderated by individual differences in emotional stability, which might influence a student's susceptibility to the experience of stress as a function of meeting multiple role obligations.

From a more applied perspective, the findings of the current study suggest a contextualized rendering of important domains of normative investment might provide an accessible mode of risk assessment and possibly intervention. Specifically, among college students, it may be useful to identify and monitor “under-committed” single students who report very low subjective educational investment, as well as “over-committed” students in committed relationships who report very high subjective educational investment. If tracking these “under-committed” and “over-committed” students revealed trajectories of increasing alcohol consumption and related problems, then future interventions could be developed and tailored to help manage normative investment, depending on a student's extremes of over-commitment or detachment. This hypothetical approach assumes a concomitant accounting of other important individual difference and demographic factors, including sex, the personality trait of self-control, cognitive abilities, as well as intermediate factors not under

consideration in the present research, such as alcohol expectancies and coping and enhancement drinking motives.

Implications aside, this study is not without caveats and limitations. In contrast to previous findings, no difference emerged between the AD and non-AD groups for working memory. This might be due to the composition of the sample (i.e., college students), which differed from previously published work that included a sizable proportion of community (i.e., non-student) participants (Finn et al., 2009). In addition, role conflict was assessed indirectly, being inferred from the interactive effect of the roles in the prediction of recent alcohol use. An explicit assessment of conflict between the roles is needed to directly test this interactive effect. Most importantly, although normative investment appears to be a sensible domain of risk for excessive alcohol consumption, any discussion of risk is more persuasively served by longitudinal data and an examination of any transactional relations that might arise over time.

Excessive drinking remains a pernicious health-related problem on college campuses. The current study provides further insight into this problem via a contextualized account of normative investment. The results not only help address the question of what factors are involved in excessive drinking, but also which combinations and levels of role participation and commitment predict greater consumption.

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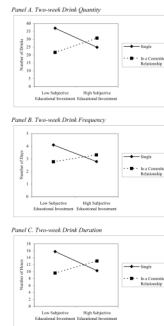


Figure 1. Committed relationship status moderates the association between subjective educational investment and drinking quantity (Panel A), frequency (Panel B), and duration (Panel C).

Table 1

AD and Non-AD Descriptive Statistics

	Lifetime AD (<i>n</i> = 86)	Non-AD (<i>n</i> = 97)	Cohen's <i>d</i>
	M (SD)	M (SD)	
Shipley IQ	107.60 (6.25)	110.69 (6.30)	.50*
Working memory	30.12 (9.01)	29.38 (9.45)	.08
MPQ control	11.08 (6.42)	17.51 (5.58)	1.08*
Subjective Educational Investment	3.53 (.85)	3.89 (.63)	.49*
% in Committed Relationship	32.6 %	52.6 %	.41*
Two-week Alcohol Drink Quantity	49.63 (35.69)	3.58 (4.85)	1.87*
Two-Week Alcohol Drink Frequency (in days)	5.69 (2.49)	1.25 (1.43)	2.23*
Two-Week Alcohol Drink Duration (in hours)	23.71 (15.40)	2.96 (3.99)	1.91*

Note.

* indicates significant group differences based on an independent samples *t* test ($p < .05$); Cohen's *d* effect size estimates for these differences range from medium (e.g., .41) to large (e.g., 1.87) in size. AD = alcohol dependence. Cohen's *d* for committed relationship status based on coding; 1 = in committed relationship, 0 = single.

Table 2

Sample-wide Correlations Between Cognitive Ability, Self-control, Subjective Educational Investment and Recent Alcohol Use Outcomes

	2-week Drink Quantity	2-week Drink Frequency (in days)	2-week Drink Duration (in hours)
Shipley IQ	-.19*	-.20*	-.22*
Working memory	.05	.07	-.04
MPQ control	-.43*	-.42*	-.39*
Subjective Educational Investment	-.22*	-.23*	-.19*

Note.

* $p < .05$.

Table 3
 Subjective Educational Investment and Committed Relationship Status Moderate Sample-wide Prediction of Recent Alcohol Use

	Recent Alcohol Use											
	Two-week Alcohol Drink Quantity			Two-week Alcohol Drink Frequency (in days)			Two-week Alcohol Drink Duration (in hours)					
	B	β	r^2	Δr^2	B	β	r^2	Δr^2	B	β	r^2	Δr^2
Step 1												
Sex	-11.17*	-.17*			--	--			--	--		
Shipley IQ	-4.94*	-.15*			-.43*	-.15*			-2.49*	-.17*		
MPQ control	-13.95*	-.42*	.23	--	-1.21*	-.41*	.20	--	-5.58*	-.38*	.19	--
Step 2												
Sex	-10.34*	-.15*			--	--			--	--		
Shipley IQ	-5.12*	-.15*			-.45*	-.15*			-2.58*	-.17*		
MPQ control	-12.69*	-.38*			-1.06*	-.36*			-5.03*	-.34*		
Subjective educational investment	-2.78	-.08			-.39	-.13			-1.44	-.10		
Committed relationship status	-4.64	-.07	.25	.01	-.37	-.06	.22	.02	-1.57	-.05	.20	.01
Step 3												
Sex	-8.77	-.13			--	--			--	--		
Shipley IQ	-4.39	-.13			-.40*	-.13*			-2.31*	-.16*		
MPQ control	-12.99*	-.39*			-1.09*	-.37*			-5.16*	-.35*		
Subjective educational investment	-6.07*	-.18*			-.66*	-.22*			-2.76*	-.19*		
Committed relationship status	-4.85	-.07			-.40	-.07			-1.72	-.06		
Subjective educational investment \times Committed relationship status	10.60*	.17*	.27	.02*	.93*	.17*	.24	.02*	4.50*	.17*	.22	.02*

Note.

* Bs and β s, as well as change in F scores related to corresponding changes in r^2 between models, $p < .05$. Sex scored 0 = male, 1 = female. Committed relationship status scored 0 = single, 1 = in a committed relationship. All continuous variables were standardized (z-scored) prior to entry into the models. Bs are interpretable in outcome units (number of drinks, number of days, or number of hours).