SELF-CONTROL AND PERCEIVED BEHAVIORAL CONTROL: AN EXAMINATION OF COLLEGE STUDENT DRINKING

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Gottfredson and Hirschi's self-control theory (1990) has been demonstrated to be a valid predictor of behaviors analogous to crime, such as alcohol use. However, research has also supported the contention that an individual's level of self-control is difficult to change due to its relative stability over time. For this reason, the present study examines the research question: does perceived behavioral control moderate the link that self-control has with alcohol consumption, or is the link additive? PBC can be changed and can be the focus of policy. Using a nonrandom prospective sample of college students, this study found evidence that there is an additive effect rather than a moderating effect between self-control and perceived behavioral control on alcohol use. Policy implications are discussed.

Drinking alcohol is common among college students and a cause for concern. Drinking alcohol, particularly in the form of binge drinking, has the potential to become abusive (Wechsler, Lee, Nelson, & Kuo, 2002). The literature concerning the consumption of alcohol and its associated problems is well developed (Hingson, Heeren, Winter, & Wechsler, 2005). However, less is known about the theoretical antecedents of college students' alcohol drinking behavior.

Criminological theories have not only been used to explain crime, but also such behaviors as alcohol consumption. Gottfredson and Hirschi's (1990) self-control theory proposes that when parents

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do not perform or inconsistently perform their parenting tasks (i.e., emotional attachment, monitoring of behavior, analyzing of behavior, and non-corporal discipline of behavior) their child is likely to develop lower self-control levels. Hirschi (2004) defines self-control as the tendency of an individual to consider a broad range of consequences for a particular behavior. A number of studies have demonstrated an association between an individual's level of self-control and his or her frequency of drinking alcohol (Arneklev, Grasmick, & Tittle, 1993; Gibbs & Giever, 1995; LaGrange & Silverman, 1999; Piquero, Gibson, & Tibbetts, 2002; Pratt & Cullen, 2000; Sorenson & Brownfield, 1995; Tibbetts & Whittimore, 2002; Winfree & Bernat, 1998). Ultimately, individuals with lower levels of self-control are attracted to drinking alcohol with greater regularity.

Social psychologists have presented theories to better understand alcohol consumption. One theory is Ajzen's (1991) Theory of Planned Behavior (TPB), which assumes that individuals choose their particular behaviors (i.e., behavior is under volitional control). To make this choice, an individual's attitudes, subjective norms, and perceived behavioral controls (PBC) influence the individual's intentions to perform a behavior. Overall, meta-analyses suggest that the TPB, as a whole, has empirical validity, especially in explaining alcohol consumption (Adams, Evans, Shreffler, & Beam, 2006; Caballero, Carrera, Munoz, & Sanchez, 2007; Cooke & Schuz, 2007; Godin & Kok, 1996; Johnston & White, 2003; Murgraff, Abraham, & McDermott, 2007; Norman, Bennett, & Lewis, 1998; Norman & Conner, 2006). However, within this literature, less attention has been given to the specific role of PBC and alcohol consumption. PBC is an individual's perception that he or she has the skills and ability necessary to perform a behavior, especially in the presence of or in connection with self-control (Shively, 2001).

The purpose of the present study is to provide an understanding of college students' alcohol consumption by examining the research question: does perceived behavioral control moderate the link that self-control has with alcohol consumption, or is the link additive? This exploratory study is important because it provides

information to help explain college student drinking. Further, the findings from the present study will provide policy implications.

To provide this understanding, the present study will outline issues pertaining to drinking among college students. Next, the empirical literature on self-control theory and the theory of planned behavior pertaining to alcohol consumption will be discussed. Finally, the methods are explained, followed by the results and discussion.

COLLEGE STUDENT DRINKING

Alcohol consumption is a common activity among college students and has been an area of concern for a number of years (Durkin, Wolfe, & Clark, 2005). Greenfield and Rogers (1999) reported that individuals between the ages of 18 to 29 represent the largest group of individuals that drink alcohol. Wechsler, Lee, Kuo, & Lee (2000) note that drinking among college students is on the rise, with instances of more abusive forms of drinking (i.e., binge drinking) also rising (Wechsler & Wuethrich, 2004). Prentice and Miller (1993) showed evidence for pluralistic ignorance among college students' perceptions of alcohol consumption. Specifically, they showed that college students, particularly males, misperceived what the social norm on campus is in regard to drinking behavior. Further, students felt that others on campus were more comfortable with drinking (Prentice and Miller, 1993).

A majority of the literature on college student drinking behavior focuses on binge drinking. For instance, this destructive behavior has been examined in the context of social learning theory (Durkin et al., 2005), social bond theory (Durkin, Wolfe, & Clark, 1999), and associated risks (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Wechsler et al., 2000; Wechsler, Lee, Hall, Wagenaar, & Lee, 2002; Wechsler, Moeykens, Davenport, Castillo, & Hansen, 1995). While studying heavy episodic drinking among college students is important, less attention has been given to occasional alcohol consumption.

Alcohol consumption, in general, has been shown to place students at risk for greater health and social problems. Wechsler et

al. (1994) argue that students who drink are likely to miss class, to engage in unplanned and unsafe sexual activity, to be victims of sexual and physical assault, to suffer unintentional injuries, and to have high rates of criminal victimization and physical or cognitive impairment. Hingson, Heeron, Winter, and Wechsler (2005) showed that more than 500,000 students were unintentionally injured because of drinking and more than 600,000 were hit or assaulted by another drinking student. Additionally, Hingson et al. (2005) reported that alcohol-related deaths between 1998 and 2001 increased 6%. Most empirical studies focus on binge drinking; however, because lower frequency alcohol consumption is still associated with numerous health and social problems (Wechsler et al., 1994; Wechsler et al., 2002; Wechsler et al., 2000; Wechsler et al., 1995), the present study will examine frequency of college student drinking episodes. This will provide valuable information on an understudied form of drinking behavior. Additionally, less research has focused on understanding the consumption of alcohol through the combination of crime and social psychological theories, especially self-control theory and PBC from the theory of planned behavior. Accordingly, the present study attempts to explain frequency of alcohol consumption through the use of these two theories.

SELF-CONTROL THEORY

One of the most popular criminological theories is Gottfredson and Hirschi's (1990) self-control theory (Agnew, 1995). Gottfredson and Hirschi (1990) present self-control theory as a general theory because it attempts to explain all individual differences in the propensity to commit or refrain from committing crime. The theory covers all crimes and analogous behavior (e.g., alcohol use) after the age of eight and within all situations. The key component of Gottfredson and Hirschi's (1990) theory is the concept of self-control. Hirschi has defined self-control as being "the tendency to consider the full range of potential costs of a particular act" (2004, p.543). Hirschi (2004) argues that self-control is the inhibitions an individual has against committing criminal or delinquent acts. These inhibitions (self-control) are seen as elements from social control theory: attachment, commitment, involvement, and belief. They contend that

individuals with low self-control can be characterized as immediate gratification seekers, shortsighted, impulsive, insensitive, and as having a preference for easy, physical (rather than mental), and exciting tasks. These characteristics allow an individual to be "relatively free of the intimate attachments, the aspirations, and moral beliefs that bind most people to a life within the law" (Hirschi, 2002, p.xxi). In other words, low self-control is due to failed social bonds that would have created a "self-imposed physical restraint" (Hirschi, 2004, p.544), resulting in an individual who is freer to commit crime and analogous acts.

According to Gottfredson and Hirschi (1990), the above characteristics of low self-control are instilled in an individual through inconsistent and ineffective parenting in terms of nurturance, discipline, and training. This type of parenting allows the child to go unpunished for bad behavior and deviant acts, resulting in characteristics of low self-control that persist into adulthood. Gottfredson and Hirschi (1990) posit that the level of self-control is time-stable and will change little from childhood to adulthood. Several longitudinal studies have shown that self-control is a relatively stable variable over time (Arneklev, Cochran, & Gainey, 1998; Turner & Piquero, 2002).

Low self-control can manifest itself in a number of ways (Gibbs & Giever, 1995). Gottfredson and Hirschi (1990) originally used low self-control to explain criminal behavior. Many researchers have attempted to examine the role of low self-control in the commission of criminal acts, and most have shown it to be an important variable in explaining crime (Pratt & Cullen, 2000). Gottfredson and Hirschi (1990) define crime as an act of force or fraud undertaken in pursuit of self-interest. Criminal behavior is associated with low self-control since they share common characteristics. Crimes offer immediate gratification, are easy to perform, and are risky and exciting (Gottfredson & Hirschi, 1990).

Low self-control can also manifest itself in acts that are analogous to criminal behavior, including doing illegal drugs, drinking alcohol, cheating in school, and gambling (Gottfredson & Hirschi, 1990). These types of acts appeal to an individual with low self-con-

trol for the same reasons as criminal behavior. In a recent study of self-control and substance use, Chapple, Hope, and Whiteford (2005) found that self-control had a direct effect on mediating the relationship between parenting variables and adolescent substance use.

Recently, attention has been given to identifying determinates of alcohol use through the use of Gottfredson and Hirschi's (1990) theory. Low self-control has been found to be an important contributor in explaining alcohol use in a number of studies (Arneklev, Grasmick, & Tittle, 1993; Gibbs & Giever, 1995; LaGrange & Silverman, 1999; Piquero, Gibson, & Tibbetts, 2002; Pratt & Cullen, 2000; Sorenson & Brownfield, 1995; Tibbetts & Whittimore, 2002; Winfree & Bernat, 1998).

Recently, researchers have examined the connection between self-control, desire for self-control, and behavior. In particular, Tittle, Ward, and Grasmick (2004) argued that there is a possible missing measure from Gottfredson and Hirschi's (1990) theory—desire for control. They argued that an individual's interest in controlling their behavior was central to their theory behavior. To clarify this position with self-control theory, Tittle et al. (2004) made the distinction between self-control (i.e., the capacity for self-control) and the desire for self-control. They stated:

> Some people may have a strong capacity for self-control but may not always want to exercise it, while others may have weak self-control ability but have such a keen interest in controlling their deviant impulses that they end up conforming. (p. 146)

This view allowed them to theorize the connection between capacity for self-control, desire for self-control, and behavior. Specifically, those individuals with little desire for self-control and capacity for self-control are more likely to be prone to criminal behavior. Whereas, individuals with high levels of capacity for self-control and high levels of desire for self-control are less likely to offend. These individuals are more likely to conform to conventional society. Tittle et al. (2004) used a community sample to show that capacity for self-control and desire for self-control interact with criminal

behavior. Further, because they assumed that capacity for self-control was stable, they showed that this interaction is contingent on an individual's level of desire for control.

Recently, Cochran, Aleksa, and Chamlin (2006) used a sample of college students to reexamine this perspective. They showed that capacity for self-control and desire for self-control has independent effects on academic dishonesty. Further, Cochran et al. (2006) showed that capacity for self-control and desire for self-control interacted, revealing that the interaction was contingent on the desire for self-control. While these studies have illuminated the issue that differences in capacity and desire for self-control exist, they have taken for granted that the individual perceives or sees control over the behavior. Gottfredson and Hirschi (1990) argued that an individual with lower levels of self-control may not recognize the consequences of their actions. Because Tittle et al. (2004) and Cochran et al.'s (2006) conceptions of desire for self-control are related to consequences, individuals with low self-control may not recognize this because they are unlikely to take the time. Higgins and Ricketts (2004) showed that this is the case in their study of low self-control and freedom, where freedom was measured using consequences that are similar to the measures of desire for self-control. However, Tittle and Botchkovar (2005) showed that individuals may be able to perceive some level of control in their behavior through the consequences of their actions. Therefore, we would expect that individuals with lower levels of self-control are likely to perceive more control over their behavior. One theoretical perspective that recognizes the importance of perception of control is the Theory of Planned Behavior.

THEORY OF PLANNED BEHAVIOR

Ajzen developed the Theory of Planned Behavior (TPB) in 1991 as a re-conceptualization of Ajzen and Fishbien's 1975 theory of reasoned action (TRA) (Broadhead-Fearn & White, 2006). Ajzen (1991) proposed four components to the TPB: attitudes (i.e., the positive or negative evaluations of a behavior), subjective norms (i.e., the perceptions of the social influences to perform or not per-

form a behavior), perceived behavioral control (PBC) (i.e., the perceptions that an individual has that they have the skills and ability to perform a behavior), and behavioral intentions (i.e., an individual's readiness to perform a behavior). The most significant adaptation from the TRA was the addition of PBC to allow for the prediction of behaviors (Broadhead-Fearn & White, 2006). Thus, the TPB provides instruction on the development of PBC.

The TPB has a complex causal logic. That is, attitudes, subjective norms, and PBC are designed to predict behavioral intentions. Behavioral intentions are hypothesized to be the direct antecedent to behavior. However, PBC is also hypothesized to be the direct antecedent to behavior. To date, a number of studies have found support for the theory of planned behavior in explaining such diverse activities as rule-abiding in homeless shelters and dental floss usage (Broadhead-Fearn & White, 2006; Lavin & Groarke, 2005, respectively). A meta-analysis by Armitage and Conner (2001) was conducted and found strong support for TPB. They concluded that TPB accounted for 27% of the variance in behavior and 39% of the variance in intentions. Attitudes, subjective norms, and PBC were found to account for significantly more of the variance than intentions or self-predictions. Specifically, PBC accounted for 27% of the variance across all behaviors (Armitage & Conner, 2001). With respect to the current study, a review of the literature has demonstrated that TPB is important in understanding alcohol consumption (Armitage, Conner, Loach, & Willets, 1999; Higgins & Marcum, 2005; McMillian & Conner, 2003; Thomsen & Rekve, 2006); however a complete test of the causal logic is beyond the scope of the present study. Our interest is in the role of PBC.[1]

According to Ajzen (2002), PBC is used to deal with situations where people do not have complete volitional control (i.e., behavior with outside influences) over the particular behavior being examined. An example of a behavior that is not completely under the control of an individual is alcohol consumption. While the initial decision to engage in this behavior is often under complete control of the person, sometimes (i.e., in the case of alcoholism or low self-control) it is not under their complete volition. However, PBC is the

only component of TPB that can directly lead to the performance of a behavior without intention. Several researchers have shown some support for the connection between PBC and behaviors such alcohol use (Conner & McMillian, 1999; Courneya, Bobick, & Schinke, 1999; Godin et al., 1996; Netemeyer, Burton, & Johnston, 1991; Sheeran & Orbell, 2000).

Conner, Warren, Close, and Sparks (1999) used the TPB to explain alcohol consumption in three prospective samples of college students. The researchers showed that attitudes, subjective norms, and PBC explained between 28% and 40% of the variance in intentions to consume alcohol. However, another study using the theory of reasoned action (Fishbein, 1967) demonstrated that subjective norms, previous behavior, and PBC were not important predictors of students' intentions to drink (Trafimow, 1996).

SELF-CONTROL THEORY AND PERCEIVED BEHAVIORAL CONTROL

On one hand, Ajzen (1991) argued that the TPB is a motivational theory that could accommodate any other measure. Some studies have shown that TPB partially mediates the effect of personality measures (Armitage, Norman, & Conner, 2002; Bamberg, Ajzen, & Schmidt, 2003; Courneya et al., 1999; McMillian, Higgins, & Conner, 2005). On the other hand, Gottfredson and Hirschi's (1990) view that, aside from self-control, the only measures that are necessary are an individuals' perceptions of opportunity. However, Gottfredson and Hirschi (1990) argued that opportunities are ever present and there was little need to examine them empirically in their studies (see Gibbs, Giever, & Higgins, 2003, for a complete argument). To examine these differences in argument, one study exists that investigates the mediating role that the TPB has with self-control and behavior. Higgins and Marcum (2005) showed that TPB only partially mediated the effect of low self-control on alcohol use. This finding is significant as it yields strong support for Gottfredson and Hirschi's (1990) contention that self-control is the main contributor to behaviors such as alcohol use. However, no known studies have examined the moderating role in the PBC and self-control

link with alcohol consumption. One researcher stated, "[a]nother promising avenue of inquiry is linking, conceptually and empirically, the self-control construct in the TPB to those in mainstream criminological theory" (Shively, 2001, p.312). This is a promising role because it allows for the determination if individuals with lower levels of self-control are likely to overestimate their skills and ability to safely drink alcohol. This sort of examination is necessary because it will further our knowledge in criminological theory, social psychological theory, and understanding drinking alcohol among college students.

THE PRESENT STUDY

The purpose of the present study is to examine the additive and moderating effects that self-control and PBC have on alcohol consumption. Given that an individual's level of self-control is not likely to change and that it will have a link with alcohol consumption, understanding an individual's perceptions of their control over drinking becomes important. That is, PBC is fluid and may be modifiable to reduce instances in drinking. Therefore, we explore the research questions: do self-control and PBC have additive links with college student drinking or does PBC moderate the link that self-control has with alcohol consumption? Thus, our understanding of drinking, self-control, and PBC is moved beyond Higgins and Marcum (2005). In addition, our understanding of the role of self-control and perceptions of control are enriched beyond Tittle et al. (2004) and Cochran et al. (2006).

This study has significance for theory, empirical studies, and policy. Theoretically, researchers will gain more information about self-control and another part of the control domain—PBC. Empirically, researchers will gain a better understanding of the measures that can be changed to reduce instances of college student drinking beyond binge drinking. From a policy point of view, college administrators, parents, and governmental officials will gain a better understanding of student drinking and be better able to develop policy to address it.

METHODS

This section presents the procedures, sampling, and measures that were used for the present study.

Procedures and Sampling

This study used a short-term prospective design, where the measures of self-control and PBC were collected at the first assessment and the measure of drinking was captured at the second assessment. The researchers administered the first assessment to college students enrolled in ten courses at an eastern college in the United States in the spring 2002 semester. Five of these courses were open to criminal justice majors only, and the additional five courses were open to all majors. The courses that were used for the present study were the ones where the professor agreed to allow the study to take place during class. The students present on the day of survey administration took part in the study. In the classroom, the researchers told the students that their decision to take part in the study was voluntary, anonymous, and confidential. After the researchers explained the rights of the respondents and gave the respondents a letter stating these rights and procedures, five students refused to take part in the study. Before completing the surveys, the students were given a specific code number that was a combination of the instructor's name, the section number, and the student's birthday. The survey was given to a total of 245 students, and after listwise deletion for missing data 232 completed surveys remained.

The first assessment had 48% (N = 111) females and 52% (N = 121) males, with a mean age of 23.29 (SD± 5.45). The sample was largely white (78.4%). Almost fifteen percent (14.8%) of the sample was African-American. The "other" category (which included Hispanics and Asians) comprised 6.8% of the sample. In comparison to the college's total student body, the sample was younger (i.e., the average age of the university was 25 years), contained more males, and had more non-whites.

Two weeks later, the researchers returned to the same classes and repeated the procedures from the first assessment so that the students could complete the second part of the study. The second

assessment had a little attrition (i.e., three students were not present during the time of administration).

Measures

The students responded to several measures including: self-control, associating with drinking peers, morals toward drinking, PBC, and drinking in the past two weeks.

Self-Control. Hirschi (2004) indicates that self-control is the tendency to consider the consequences of one's actions. He goes on to indicate that measures of self-control are likely to be inhibitions relating to "Person X would be disappointed if you did this." Although the dataset for the present study was collected before Hirschi (2004) made this proclamation, the measures of self-control come from a pilot study of 40 individuals (who were not included in the final sample) that were asked to indicate individuals that would be important in stopping them from drinking. This approach is consistent with Piquero and Bouffard (2007) in developing the "person" that would be disappointed with the student if they drank. From the pilot study, the individuals indicated that health experts, family, friends, and best male or female friends would be important in stopping them from drinking alcohol. We believe, as Piquero and Bouffard (2007) argue, that the subject generation of this list provides content validity of the items that we used as measures of self-control.[2]

We used these individuals' responses and asked the larger sample of students five questions about whether these individuals thought that they should drink. The students recorded their responses on a 7-point Likert-type scale. The scale was anchored by the responses "should not drink" and "should drink." The scale had acceptable internal consistency (Cronbach's alpha = .78). The mean of the scale was 25.45 with a standard deviation of 6.69.

Perceived Behavioral Control. The perceived behavioral control (PBC) measure consisted of three items that had 7-points: "How much control do you have over whether you do or do not drink in the next two weeks?" (No control at all—Complete control); "I believe I have the ability to drink" (Definitely not do—

Definitely do); "To what extent do you see yourself as being capable of drinking alcohol" (Very Incapable—Very Capable).[3] The internal consistency of these items was an acceptable .74. The mean of the scale was 13.40 with a standard deviation of 1.70.

Associating with Drinking Peers. Consistent with Gibson and Wright (2001), associating with drinking peers was a composite measure of three items. These items asked the students how many of their friends drank in the last two weeks, how many of their best male friends drank in the last two weeks, and how many of their best female friends drank in the last two weeks. The students marked their responses to these items on a 7-point Likert-type scale that ranged from "none" to "all." The internal consistency for this measure was .73, with a mean of 10.26, and a standard deviation of 4.91.

Moral views of Drinking. Consistent with Bachman, Paternoster, and Ward (1992), the moral views of drinking were captured using three items. The first item asked students their level of agreement that it is morally wrong to ever drink. The second item asked students their level of agreement that it is wrong to drink now. The third item asked students their level of agreement that they are moral individuals. The students recorded their agreement to the items using 7-point Likert-type items that were anchored by the answer choices "strongly disagree" to "strongly agree." The internal consistency for this scale was acceptable (.73), with a mean of 10.41, and standard deviation of 4.70.

Drinking. Self-reported drinking was assessed two weeks after the first survey. The drinking scale was comprised of three items. The first item asked students if they had drunk alcohol in the past two weeks. The second item asked students if they had tried alcohol in the past two weeks. The students recorded their responses to these items using a 7-point Likert-type scale that was anchored by the choices "strongly disagree" and "strongly agree." The third item asked students if they had frequently drank alcohol in the past two weeks. The students recorded their responses to these items using a 7-point Likert-type scale that was anchored by the choices "none" and "every day." The internal consistency was acceptable

(Cronbach's alpha = .94), with a mean of 8.25, and a standard deviation of 4.95.

Demographics. Two specific demographic measures were used in the present study. The first was the individual's sex. The mean score for this measure was 1.51, indicating that more males participated in the study. Next, the individuals indicated their age, which, as presented above, was an average of 23.29 years (SD± 5.45).

RESULTS

To determine the additive and interaction between self-control and PBC, the bivariate correlations and a series of regression analyses were necessary. Table 1 presents the bivariate correlations. The bivariate correlations among the measures indicate that no multicollinarity is present in the data. However, the largest correlation was between self-control and drinking peers (r = .56), suggesting that multicollinarity may be present. Accordingly, additional analyses were necessary to verify this interpretation. Aside from this connection, Table 1 indicates that the other measures have relevant links that are in their logical directions.

Table 1. Bivariate correlations among the measures

	1	2	3	4	5	6	7
1. Drinking	1.00						
2. Peers	.44**	1.00					
3. Morals	-.27**	-.28**	1.00				
4. Self-control	-.54**	-.56**	.35**	1.00			
5. PBC	.40**	.25**	-.31**	-.50**	1.00		
6. Sex	.15*	.02	.08	-.03	.03	1.00	
7. Age	-.20**	-.11	.06	.03	-.09	-.16*	1.00

Note: * denotes statistical significance at the .05 level.
** denotes statistical significance at the .01 level.

Table 2 presents the first of two regression analyses. This regression analysis provides an examination of the additive effects of self-control and PBC, while controlling for drinking peer association, morals, and demographics. The results of this analysis indicate that self-control has a significant and negative link with drinking alcohol (b = -.267, Beta = -.360, t = -5.140). This suggests that Hirschi (2004) is correct that the higher the level of self-control the less an individual will drink. Further, PBC has a significant link with drinking (b = .113, Beta = .153, t = 2.530). This supports Ajzen's (1991) assumption that individuals will drink when they perceive more control over their drinking. Further, the present study finds support for Pratt and Cullen's (2000) argument for including a measure of peers, since peer drinking association had a significant link with drinking (b = .169; Beta = .164, t = 2.604). Finally, Table 2 indicates that younger individuals drank most often in the two-week period (b = -.114, Beta = -.154, t = -2.910).

To investigate the multicollinarity interpretation from the bivariate correlations, we examined the variance inflation factors and the tolerances (Field, 2000). Table 2 shows that none of the toler-

Table 2. Additive regression analysis with drinking as the dependent measure

Independent Variable	b	Std. Error	Beta	t	Tolerance	VIF
Peers	.169	.065	.164	2.604*	.672	1.488
Morals	-.073	.060	-.069	-1.221	.836	1.196
Self-Control	-.267	.052	-.360	-5.140*	.547	1.829
PBC	.113	.045	.153	2.530*	.734	1.363
Sex	.999	.522	.101	1.914	.964	1.038
Age	-.114	.039	-.154	-2.910*	.959	1.043
R^2		.398				
F		24.783*				

Note: * denotes statistical significance at the .05 level.

ances were close to .20, nor were variance inflation factors close to 10. These findings indicate that multicollinarity is not an issue in these data.

Table 3 presents the second regression analysis that explored the interaction between self-control and PBC. To perform the examination using the interaction we mean centered self-control and PBC using the technique advocated by Aiken and West (1991). The goal of this technique was to reduce the chance of multicollinarity between the additive terms and the interactive terms. However, an inspection of the multicollinarity diagnostics will be necessary to determine if this technique accomplished this goal.

Table 3. Interactive regression analysis with drinking as the dependent measure

Independent Variable	b	Std. Error	Beta	t	Tolerance	VIF
Peers	.171	.065	.167	2.637*	.671	1.491
Morals	-.073	.060	-.069	-1.219	.836	1.196
Self-Control	-.257	.053	-.347	-4.830*	.520	1.922
PBC	.136	.053	.184	2.575*	.524	1.909
Sex	.928	.529	.094	1.753	.938	1.066
Age	-.115	.039	-.155	-2.928*	.958	1.044
Self-Control X PBC	-.006	.007	-.051	-.820	.689	1.450
R^2		.400				
F		21.307*				

Note: * denotes statistical significance at the .05 level.

Table 3 indicates similar additive effects with drinking alcohol between self-control (b = -.257, Beta = -.347, t = -4.830), associating with drinking peers (b = .171, Beta = .167, t = 2.637), PBC (b = .136, Beta = .184, t = 2.575), and age (b = -.115, Beta = -.155, t = -2.928). However, the interactive term does not have a significant link at the .05 level with drinking alcohol. This indicates that self-control and PBC have separate additive effects rather than interactive effects with drinking alcohol.

To determine if the mean centering procedure was performed correctly, the collinarity diagnostics were examined. The tolerances were above .20, and the variance inflation factors were below 10 for each of the measures. Therefore, the conclusion can be drawn that the mean centering procedure performed as expected (i.e., there is no multicollinearity).

DISCUSSION

This study began with the purpose of exploring the additive and interactive effects of self-control and PBC on drinking among college students. Studies show that drinking can lead to health problems for young adults. Further, some studies have shown that drinking has important residual health and social consequences for individuals who are around those that drink.

The results of the present study indicate that self-control has a link with college student drinking. This is support for Gottfredson and Hirschi's (1990) theory and Hirschi's (2004) redefinition of self-control. Importantly, this indicates that individuals that have more inhibitions are more likely to resist the temptation to drink. Further, this indicates that those with lower inhibitions will drink alcohol. Not only do the present results support Hirschi's (2004) redefinition, but the results support the findings of previous research. The results of the present study advance our understanding of the link between self-control and college student drinking because the new definition provides more information about how the six characteristics of self-control behave.

The results also show that PBC has a link with alcohol consumption. This supports Ajzen's (1991) assumption that when individuals believe they have control over their behavior they are more likely to do so. Further, this finding is consistent with previous research in the theory of planned behavior literature concerning drinking (Armitage et al., 1999; Higgins & Marcum, 2005; McMillian & Conner, 2003; Thomsen & Rekve, 2006). This is important because individuals may have unclear perceptions of their control over drinking, which may be due to each individual's level of self-control.

To determine if an individual's perception of control over drinking is due to his or her self-control level, we examined an interactive effect. The results from the interaction term did not show that self-control and PBC interacted. Thus, we concluded that self-control does not seem to impair an individual's perceptions about his or her level of control for drinking. Because we did not find support for a moderating effect, we are unable to discount the mediating link found by Higgins and Marcum (2005). This seems to counter Gottfredson and Hirschi's (1990) argument that an individual's level of self-control will shape the person's perception about the consequences of his or her behavior. However, we believe that this may be true of the consequences of behavior but not true for every part of life. That is, self-control may be very important in the perception of the consequences of drinking alcohol, but not very influential in the perceptions of an individual's control of drinking.

The present study shows that associating with drinking peers has an important link with drinking. This finding is consistent with a large body of research on drinking. In fact, Cooper (1994) argued that one of the most important motives for drinking was due to social (i.e., peer) norms (also see Akers, 1998, for additional studies that show a peer influence for drinking). This finding is also consistent with Pratt and Cullen's (2000) assertion that researchers should include a measure of peer association in their self-control theory studies. However, Pratt and Cullen (2000) and Akers (1998) argued that peer association would have the largest impact on behavior. The results from the present study indicate that self-control has the largest impact on the drinking of college students. This could be because self-control is captured in accord with Hirschi's (2004) view and thus provides more influence because of the personal nature of the inhibitions. Or, this could be due to the items that we used to capture association with drinking peers. We also contend, as does Hirschi (2004), that an individual's assessment of peers is actually another indication of his or her own drinking. Therefore, our measurement takes the effect of peers away.

From this study, policy implications can be drawn to assist college administrators, parents, and government officials. College

administrators and government officials can develop policies that will make obtaining alcohol more difficult. Hingson et al. (2005) argued that the opportunity for alcohol should be more difficult, which would reduce alcohol use among college students. This policy implication ties into the results of the present study because individuals with low self-control would find alcohol use less attractive if more barriers to obtaining it were present. This is because individuals with deficits in self-control have a here-and-now orientation.

Parenting courses can be offered to families—whether single parent or dual parents—that can help instill better parenting skills—that is, parenting courses that help parents better understand how to monitor their children, analyze behavioral information, recognize behavioral information, and non-corporally discipline behavior. The improvements resulting from these courses would initiate "grass-roots" action to reduce the attractiveness of drinking alcohol.

College administrators, parents, and government officials can also focus their efforts on peer selection. That is, selecting peers as friends that are non-drinkers will provide a reduction in drinking. This effort will require an educational program that will assist students in developing criteria to better choose their friends.

While this study has found that self-control and PBC are influential in understanding drinking among college students, the study is not without limits. For instance, the study was confined to only one institution. However, replications of these findings are likely to reveal similar results, given that our findings are similar to previous research. In addition, the study used a convenience sample of college students rather than a random sample. This limit is minimized because self-control and PBC are derived from larger general theories that propose to either explain all crime all of the time or all behaviors all of the time. The present study did not examine the more destructive form of drinking—binge drinking. Future studies should examine this issue to determine if the same results would appear.

Despite the limits, the present study has important findings that are notable. First, self-control and PBC have additive effects

rather than interactive effects. Second, the present study advances our understanding of the role of self-control by examining an important new conceptual definition of self-control. While studies that use samples from multiple colleges and that examine binge drinking will be helpful in understanding drinking among college students, for now, the present study indicates that self-control and PBC are additively important in understanding drinking among students.

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ENDNOTES

1. Researchers have argued that PBC is similar to Bandura's (1977) version of self-efficacy (Broadhead-Fearn & White, 2006), but they have inadvertently tested the two concepts using similar measures (Rhodes & Blanchard, 2006; Kraft et al., 2005). Although Ajzen (2002) concedes that his theory owes a large debt to Bandura's work on self-efficacy, he argues that PBC and self-efficacy differ. Bandura (1991, p.257) defines perceived self-efficacy as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives." Ajzen (2002) reports that Bandura sees perceived self-efficacy as referring to "beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainments." Ajzen, however, counters that PBC is not the belief in performing an act to result in a desired outcome but is rather "the subjective degree of control over performance of the behavior itself" (2002, p.4). Thus Ajzen clarifies the meaning of PBC as being the "perceived control over performance of a behavior" (2002, p.4). For this reason, the current study will focus on PBC.

2. We would like to thank an anonymous reviewer for comments and suggestions about the operationalization of self-control. It can be argued that our operationalization of this variable is similar to that of subjective norms from the TPB. We can acknowledge that the reviewer is correct in regard to the TPB; however, this operationalization accurately captures self-control based on Hirschi's (2004) reconceptualization.

3. The 7-point Likert-type scales for all measures within this study were anchored by the endpoints described in the discussion of each measure. The numbers between the endpoints had no description associated with them. This method is consistent with the conventions of Ajzen (2002) in studying the TPB.