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Social self-control is a statistically non-redundant correlate of adolescent substance use

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Abstract

The Social Self-Control Scale (SSCS), which taps provocative behavior in social situations, was compared with five potentially-overlapping measures (i.e., temperament-related impulsivity, psychomotor agitation-related self-control, perceived social competence, and rash action in response to negative and positive affectively-charged states) as correlates of tobacco use and other drug use among a sample of 3,356 9th grade youth in southern California high schools. While there was a lot of shared variance among the measures, the SSCS was incrementally associated with both categories of drug use over and above alternate constructs previously implicated in adolescent drug use. Hence, social self-control (SSC) may relate to adolescent drug use through an etiological pathway unique from other risk constructs. Given that youth who tend to alienate others through provocative social behavior are at risk for multiple drug use, prevention programming to modify low SSC may be warranted.

Introduction

Identifying individual difference traits in propensity for substance use among teens is critical for advancing theories of drug use etiology and informing prevention interventions that aim to offset such risk. Individuals lower in social self-control (SSC) tend to provoke others in social situations, exhibiting attitudes and behaviors that favor immediate gratification of urges at the cost of possible social alienation (e.g., arguing with people; Sussman, McCuller, & Dent, 2003). Additionally, low SSC represents tendencies such as speaking one's mind without thinking and being insensitive and self-centered in social interactions. Thus, poor SSC may be a unique etiological correlate of drug use in teens, as youths with low SSC may seek out drug use as a means for: (1) stimulation or as a substitute for lack of social connection/reinforcement (Petratis, Flay, & Miller, 1995); (2) temporarily improving SSC ability through the drugs' direct pharmacological effects (e.g., nicotine/stimulants may enhance general self-control, Potter & Newhouse, 2008; alcohol, marijuana, and sedatives may reduce negative affect or social anxiety states that might be provoking the tendency to 'acting out' in social settings, Buckner, Eggleston, & Schmidt, 2006); or (3) reducing negative affect or enhancing their self-control due to expectancy effects. Having trouble

inhibiting maladaptive social behavior could motivate willingness to experiment with a greater diversity of substances, as each substance may be perceived by low-SSC adolescents to have distinct pro-social, affect-enhancing, and/or impulsivity-reducing pharmacological effects.

Indeed research has shown that poorer SSC, measured by the Social Self Control Scale (SSCS), correlates with adolescent substance use and other disruptive behaviors. These associations are consistent across: (1) cross-sectional designs (Forster, Grigsby, Unger, & Sussman, 2015; Pokhrel, Sussman, Sun, Kniazev, & Masagutov, 2010; Sussman, McCuller & Dent, 2003) and prospective designs predicting future drug use from previous SSC (Pokhrel, Sussman, Rohrbach, & Sun, 2007; Pokhrel et al., 2013; Pokhrel, Sussman, & Stacy, 2014); (2) various settings spanning alternative (continuation) high schools (Pokhrel, Sussman, Rohrbach, & Sun, 2007; Pokhrel, Sussman, & Stacy, 2014; Sussman, McCuller & Dent, 2003), traditional high schools (Pokhrel, Sussman, Rohrbach, & Sun, 2007; Pokhrel et al., 2010; Pokhrel et al., 2013), and middle schools (Forster, Grigsby, Unger, & Sussman, 2015); and (3) several demographic strata, including predominately Mexican-American youth samples (Pokhrel et al., 2013), Russian youths (Pokhrel, Sussman, Sun, Kniazev, & Masagutov, 2010), and a relatively large percentage of African American youth samples (41% of the sample; Forster, Grigsby, Unger, & Sussman, 2015). These studies provide evidence of concurrent and predictive validity for the SSCS.

SSC is a consistent correlate of adolescent drug use and has shown some incremental predictive value in differentiating teen substance use in adolescents over and above personality disorders, sensation seeking, and demographic factors (Sussman, McCuller & Dent, 2003; Pokhrel et al., 2010; Pokhrel, Sussman, & Stacy, 2014), which is also suggestive of construct validity. However, there are several other constructs implicated in adolescent drug use that could potentially explain (or confound) this relation. For instance, rather than a self-control deficit manifested in social situations per se, low SSC may overlap with novelty seeking temperament-related impulsivity, psychomotor agitation-related lack of self-control, or rash action during extremely negative or positive affect, all of which have been implicated in drug use risk (Ivanov, Schulz, London, & Newcorn, 2008; Marmorstein, 2011; Pang et al., 2014). Alternatively, it is unclear whether SSC is an essential factor – or is solely a proxy – for social competence (with or without self-control dysregulation), which is a known correlate of substance use (Kaplow, Curran, Dodge, & Conduct Problems Prevention Research, 2002).

In the present cross-sectional study of 9th grade high school students, we hypothesized that SSC would be found to be associated with a greater diversity of use of various tobacco products and other drugs over and above five potentially overlapping constructs tapping novelty seeking temperament-related impulsivity, psychomotor agitation-related self-control, perceived social competence, and rash action in response to negative and positive affectively-charged states. It is critical to identify whether SSC is incrementally associated with substance use in teens over and above these alternative and potentially-overlapping constructs in order to elucidate whether there is a unique etiological pathway linking SSC and adolescent drug use. If such a finding is obtained, it may provide impetus for including SSC assessments in psychosocial measurement batteries aimed at identifying teens that may

be high risk and in need of intervention; and inform whether targeting low SSC *per se* might be a fruitful drug misuse prevention target.

Methods

Sample

Data were drawn from the first wave of the Happiness and Health (H&H) study of the association between psychopathology (e.g., anhedonia) and health behavior in adolescents. This four-year study involves longitudinal data collection, every six months, though the SSCS was only measured at the first data collection. The participants recruited for this study were 3,356 9th-grade students attending 10 high schools in Los Angeles with the exception of those in either special education or English as a second language programs. Efforts were made to obtain a sample of schools with a wide range of socioeconomic characteristics. The median annual household incomes in the ZIP codes served by the schools ranged from \$54,000 to \$82,000, according to 2010 U.S. Census data. Trained research assistants visited the students' classrooms, explained the study, and distributed consent forms for the students to take home for their parents to sign. If students did not return the consent forms, the research assistants telephoned their parents to ask for verbal parental consent. Students provided written assent. This procedure was approved by the USC Institutional Review Board.

Survey Procedure and Measures

On the day of the survey, data collectors distributed paper-and-pencil questionnaires. The data collectors reminded the students that they could skip any questions they did not want to answer. Demographic variables included *gender* (0 = female, 1 = male) and *ethnicity* (coded as 0 = Other, 1 = Hispanic). There were two outcome measures. *Tobacco Use* was measured with the sum of 9 tobacco related items (puff of cigarettes, whole cigarettes, e-cigarette, smokeless tobacco, big cigars, cigarillos, hookah water pipes, blunts, and other form of tobacco) used in the past 6 months, so scores could range from 0 to 9. Response categories for each product are either NO (coded 0) or YES (coded 1). *Other Drug Use* was measured with the sum of 14 non-tobacco products, including marijuana, alcohol, inhalants, cocaine, methamphetamine, hallucinogens, ecstasy, heroin, salvia, prescription pain killers (used "to get high"), sedatives, diet pills, prescription stimulants (used "to get high"), and any other pill or illegal drug, used in the past 6 months, so scores could range from 0 to 14. Response categories for each product are either NO (coded 0) or YES (coded 1).

The *Social Self-Control Scale* (SSCS; Sussman, McCuller, & Dent, 2003) included 10 items related to social self-control (e.g., "I enjoy arguing with people" and "If I think something someone says is stupid, I tell them so"). For each item, response options ranged from "Never" (1) to "Always" (4) and a mean score was computed. The internal consistencies across studies have been moderately high, ranging from .73 (Pokhrel and colleagues, 2007, 2010; Sussman and colleagues, 2003), to .76 (Forster and colleagues, 2015; Pokhrel and colleagues, 2013) to .84 (Pokhrel and colleagues, 2014). In this study the alpha coefficient was .76.

The *Temperament and Character Inventory (TCI)* (Cloninger, 1992; Cloninger, Przybeck, Svrakic, & Wetzel, 1994) 5-item version of the *Novelty Seeking Impulsivity (TCI-I)* subscale (e.g., “I like to think about things for a long time before I make a decision” and “I like to explore new ways of doing things”) was used from the TCI-125 (Cloninger, 1992). Leventhal et al. (2007) had found that this 5-item measure was the strongest correlate among three dimensions of temperament with abstinence-related withdrawal, negative affect, and craving. Participant’s responded to each item with “True” (0) or “False” (1). Some items were reversed coded and higher scores reflected higher levels of impulsivity. Because the items are dichotomous, the alpha coefficient for this 5-item measure is .58 based on Pearson correlations and is .72 derived from tetrachoric correlations.

The *Restlessness and Agitation Questionnaire (RAQ)* (Wong & Leventhal, 2014) used in this study consisted of 19 items (e.g., “Feeling wound up” and “Having difficulty keeping still”). This transdiagnostic measure taps aspects of poor self-control stemming from unintentional psychomotor agitation and restlessness (e.g., fidgeting, pacing back and forth, shaking). The mean of the 19 items was used, with higher scores representing higher levels of restlessness”). Response choices ranged from “Never” (1) to “Always” (5). Mean scores were computed, with higher scores representing higher levels of restlessness (alpha coefficient=.93).

The *Perceived Social Competence Scale (PSCS)* (Anderson-Butcher et al., 2014) consisted of 5 items related to perceived social competence (e.g., “I find it pretty easy to make friends” and “I am popular with others my age”). Social competence is the degree to which adolescents engage in prosocial behaviors that allow them to create and maintain positive social interactions with others. While this measure does not tap self-control directly, it might reflect that aspect of a social self-control measure related to social competence (whether or not it involves lack of self-control). Participant’s response options ranged from “Not at all true for me” (1) to “Really true for me” (4). The mean of the 5 items was used, with higher scores reflecting higher level of social competence (alpha coefficient=.88).

The *UPPSP Impulsivity Scale* (Cyders & Smith, 2007) 12-item Negative Urgency (e.g., “Sometimes when I feel bad, I can’t seem to stop what I am doing even though it is making me feel worse” and “When I feel bad, I will often do things I later regret in order to make myself feel better now”) and 14-item Positive Urgency (e.g., “When I am very happy, I can’t seem to stop myself from doing things that can have bad consequences” and “When I am in a great mood, I tend to get into situations that could cause me problems”) subscales were used. These scales measure the tendency to act rashly when one is in an unusually negative or positive mood. There were 4 response alternatives to each item, which ranged from “disagree strongly” (1) to “agree strongly” (4). The alpha coefficients for these measures were .88 and .94, for negative and positive urgency, respectively.

Results

Among the 4,100 students who were invited to participate in this study, 3,396 (82.9%) provided parental consent; 3,874 (94.5%) provided student assent; and 3,356 (98.8% of those for whom parental consent was obtained) completed all the items for the current

analysis. Age of the participants ranged from 12 to 16, with average of 14.07; 54.71% were female; 62.17% of the parents had completed high school education, with 45.05% having college or more advanced degrees. Among the participants, 45% were Hispanic, 5% were African American, 17% were White, 18% were Asian, and 15% were “Other” (1% American Indian, 4% Native Hawaiian/Pacific Islanders, and 10% mixed ethnicity). Descriptive statistics and correlation coefficients of the covariates and outcome variables described in the measures section are summarized in Table 1.

Outcome measures in this study are counts of tobacco products (0 to 9) and other drugs used (0 to 14) in the last 6-months. The average count was 0.36 for tobacco products used and 0.33 for other drugs. That is, participants, on average, reported the use of less than one tobacco product and less than one other drug in the past six months. Cronbach’s alphas are reported on the diagonal of the correlation matrix for each covariate. The Cronbach’s alphas are moderately high for all measures.

To account for the clustering effect due to school and the count nature of outcomes on use of tobacco products and other drugs, multilevel Poisson regression models were used with school treated as a random effect. Results from null models showed that the ICCs for tobacco use and other drug use were 0.02 and 0.03, respectively, which are within the typical range of school-based studies (Murray & Hannan, 1990). Results of the full models including all the covariates to investigate their associations with tobacco use and other drug use are reported in Table 2. The tobacco use index was significantly associated at $\alpha = .05$ with TCI-I, UPPSP-Positive Urgency and SSCS; other drug use was associated with TCI-I, RAQ, UPSSP-Positive Urgency and SSCS. The Psuedo-Psedo- R^2 (Heinzel & Mittlböck, 2003) increments are .22 and .23 for tobacco use and other drug use, respectively, after including all the covariates in the model. The unique contribution of the main covariate, SSCS, is about .01 (about 5%) in R^2 increment in both models. TCI-I showed unique contributions of .02 in both models (about 10%). UPSSP-Positive Urgency showed unique contributions of .005 and .004 for the tobacco use and other drug use models (about 2% in both models). RAQ didn’t have any impact on tobacco use, but accounted for .03 (about 15%) in R^2 increment to the variation of other drug use.

Discussion

These results suggest that while there is a large shared covariance among the five measures, the SSCS is statistically non-redundant with the other measures examined for their association with tobacco use and other drug use. Thus, the association between low SSC and drug use in teens does not simply reflect the fact that the SSCS is measuring novelty seeking temperament impulsivity, psychomotor agitation-related self-control, perceived social competence, or rash action in response to negative and positive affectively-charged states. Rather, these results suggest that a tendency towards provocative, uncontrolled behavior in social situations may be uniquely implicated in teen drug use (as also are novelty seeking temperament impulsivity and positive affect urgency). In general, having higher social self-control is likely to help adolescents learn and perform prosocial behaviors, whereas lack of social self-control may expose them to higher levels of social conflict and encourage them to affiliate with deviant peers (Pokhrel, Sussman, & Stacy, 2014).

There are several limitations in this study, including the fact that this is a cross-sectional design, and the tobacco and drug use composite measures are not ideal (e.g., we measure use in the last six months without regard to frequency of use). However, this study does support the suggestion that the SSCS may be able to assist in identifying youth relatively low in social self-control and at risk for drug use. Preventing drug misuse through modification of SSC is already being instructed in Project Towards No Drug Abuse (Sussman, 2015), with the assumption that instruction in SSC may assist youth in avoiding antagonism of others and possibly permit them to socialize with prosocial others and avoid drug use. The specific effect of SSC instruction on drug use intentions or behavior has not been examined and may be a topic for future research.

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Table 1Descriptive Statistics and Correlation and Cronbach's Alpha Coefficients^a

Variable ^b	M	(SD)	Correlation Coefficients			
Tobacco Use	.36	(.96)	<u>.78</u>			
Other Drug Use	.33	(.96)	.64	<u>.83</u>		
TCI-I	.50	(.30)	.13	.11	<u>.58</u>	
RAQ	1.22	(.82)	.10	.16	.15	<u>.93</u>
PSCS	2.83	(.74)	.02	.01	.03	-.16 <u>.88</u>
UPPSP-Neg	1.96	(.65)	.16	.20	.21	.56 -.18 <u>.88</u>
UPPSP-Pos	1.64	(.62)	.18	.20	.20	.46 -.08 .76 <u>.94</u>
SSCS	1.92	(.49)	.16	.19	.20	.50 -.04 .53 .42 <u>.76</u>

^a. Cronbach's alphas are underlined and reported on the diagonal of the correlation matrix.^b. TCI-I: Temperament and Character Inventory Novelty Seeking Impulsivity Subscale; RAQ: Restlessness and Agitation Questionnaire; PSCS: Perceived Social Competence Scale; UPPSP-Neg: Negative Urgency subscale of revised version of UPPS (UPPSR); UPPSP-Pos: Positive Urgency subscale of UPPSP; SSCS: Social Self-Control Scale.

Table 2

Parameter Estimates for Factors Associated with Tobacco and Other Drug Use

Covariates ^a	Tobacco Use		Other Drug Use	
	B	Ste	B	ste
Intercept	-3.61**	0.30	-3.69**	0.29
Male	0.12	0.06	-0.13	0.07
Hispanic	0.10	0.07	0.11	0.07
TCI-I	0.79**	0.11	0.61**	0.11
RAQ	0.00	0.05	0.15**	0.05
PSCS	0.07	0.04	0.01	0.04
UPPSP-Neg	0.07	0.08	0.11	0.08
UPPSP-Pos	0.37**	0.07	0.30**	0.07
SSCS	0.45**	0.07	0.56**	0.07

^a. TCI-I: Temperament and Character Inventory Novelty Seeking Impulsivity Subscale; RAQ: Restlessness and Agitation Questionnaire; PSCS: Perceived Social Competence Scale; UPPSP-Neg: Negative Urgency subscale of revised version of UPPS (UPPSR); UPPSP-Pos: Positive Urgency subscale of UPPSP; SSCS: Social Self-Control Scale.

*. Significant at $\alpha = .05$;

**. Significant at $\alpha = .01$