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Gender Differences in Body Consciousness and Substance Use Among High-Risk Adolescents

DAVID SCOTT BLACK¹, STEVE SUSSMAN², JENNIFER UNGER³, PALLAV POKHREL⁴, and PING SUN²

¹ University of Southern California, Institute for Health Promotion and Disease Prevention Research, Alhambra, California, USA

² University of Southern California, Alhambra, California, USA

³ Claremont Graduate University, School of Community and Global Health, Claremont, California, USA

⁴ University of Hawaii, Cancer Research Center of Hawaii, Prevention and Control Program, Honolulu, Hawaii, USA

Abstract

This study explores the association between private and public body consciousness and past 30-day cigarette, alcohol, marijuana, and hard drug use among adolescents. Self-reported data from alternative high school students in California were analyzed (N = 976) using multilevel regression models to account for student clustering within schools. Separate regression analyses were conducted for males and females. Both cross-sectional baseline data and one-year longitudinal prediction models indicated that body consciousness is associated with specific drug use categories differentially by gender. Findings suggest that body consciousness accounts for additional variance in substance use etiology not explained by previously recognized dispositional variables.

Keywords

private body consciousness; public body consciousness; adolescence; substance use; high-risk; alternative high school

Introduction

Research has identified several important personality dispositions related to the etiology of adolescent substance use and misuse. Those most popular in the literature include anxiety, depression, stress, impulsivity, and aggression (Acton, 2003; Diego, Field, and Sanders, 2003; Finkelstein, Kubzansky, and Goodman, 2006; Garrison, McKeown, Valois, and Vincent, 1993; Kandel et al., 1997; Wills, Sandy, and Yaeger, 2000). Other dispositional variables that have been less studied in the etiology of substance use among adolescents relate to body consciousness, which is a person's awareness of their internal physiology and external bodily appearance. These less studied dispositions are important to investigate since

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Address correspondence to David Scott Black M.P.H., University of Southern California, Institute for Health Promotion and Disease Prevention Research, 1000 S. Fremont Avenue, Unit #8, Building A-5, Alhambra, CA 91803-4737; davidbla@usc.edu.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

the onset of puberty leads to substantial physiological and psychological changes among youth that can influence self-image and self-esteem, and subsequent substance use. Also, since body consciousness varies widely across youth (Miller, Murphy, and Buss, 1981), the ways in which adolescents perceive and react to their body may be of importance to identify subgroups of adolescents at highest risk for substance use.

Private Body Consciousness

Private body consciousness (PBC) is defined as one's sensitivity to perceive internal bodily sensations such as muscle tension and body temperature. The majority of research in this area has examined the impact of PBC on pain symptoms (Ahles, Pecora, and Riley, 1987; Ingram, 1990; Martin, Ahles, and Jeffery, 1991; Vervaeke, Bouman, and Valmaggia, 1999). This research suggests that healthy people with higher PBC and anxiety report higher frequency and intensity of pain (Martin et al., 1991; Spielberger, Gorsuch, and Lushene, 1970). Thus, it has been postulated that people with high levels of PBC are more attuned to their internal physiology. Similar mechanisms have been suggested in substance use research examining PBC. Miller (1981) found those with higher PBC reported an increased stimulating response to caffeine compared to those with lower PBC scores. Fenigstein (1975) explained this finding by stating that subjects high in PBC are keenly aware of physiological events, and are especially susceptible to physiological feedback from substance use. Moreover, he suggested that people high in PBC may be those most affected by weak or mild doses of drugs. These notions are supported by the Information Processing Model, which posits that increased attention drawn toward bodily input can culminate in an amplification of that input (Ahles, Pecora, and Riley, 1987; Barsky and Klerman, 1983; Leventhal and Everhart, 1979; Pennebaker, 1982).

Public Body Consciousness

Public body consciousness (PubBC) involves a chronic proneness to focus on and be concerned with the exterior appearance of one's body such as facial features, posture, and body weight (Miller et al., 1981). Similar to the concept of body image, PubBC plays an important role in adolescent development as youth, during adolescence, experience changes in their physical appearance and become involved in more complex social relationships (Sweeney and Zionts, 1989). Thus, adolescents who dislike their physical appearance, and perceive their peers to hold similar opinions about them, may enact substance use behaviors that they believe make them more socially attractive. This notion is supported by research that suggests that adolescents engage in substance use behaviors to establish social relationships and to obtain approval from peers (French, Story, Downes, Resnick, and Blum, 1995). Considering that traits such as social competence are attributed to attractive people even when those traits are actually lacking in those individuals (Jackson, 2002), adolescents who perceive themselves as unattractive may use substances as a social avenue to offset their perceived poor appearance, attempting to behave in a manner typically attributed with socially attractive people (Nieri, Kulis, Keith, and Hurdle, 2005).

Gender and Body Consciousness

Gender differences in body consciousness have been identified. Females report significantly higher PubBC scores than males; however, differences in PBC scores have not been identified (Fenigstein 1975; Miller et al., 1991). PubBC gender differences exist likely because male and female adolescents perceive and react to their bodies differently. For example, gender differences in body dissatisfaction emerge between 13 and 15 years of age, with a higher percentage of females being dissatisfied with their body (McCabe and Ricciardelli, 2004; Rosenblum and Lewis, 1999) and displaying more negative body image than males (Benjet and Hernandez-Guzman, 2001; Palmqvist and Santavirta, 2006; Rask, Astedt-Kurki, Tarkka, and Laippala, 2002; Siegel, Yancey, Aneshensel, and Schuler, 1999).

This tends to be caused by adolescent girls valuing physical appearance and believing it to represent a more important personal quality than do boys (Simmons and Blyth, 1987). One promising model used to explain these gender differences in bodily self-evaluation is the Objectification Theory (Fredrickson and Roberts, 1997). This theory emphasizes how Western culture socializes females, more than males, to internalize an objectifying observer's perspective of their own physical appearance. Consequently, since girls are more self-conscious and dissatisfied about their appearance than boys, girls high in PubBC may engage in substance use more often than boys to improve their body image.

The Present Study

The purpose of this study was to examine the association between two adolescent body consciousness dispositions and substance use among high-risk teens [alternative high school (AHS) students]. AHS students have higher rates of substance use compared to regular high school teens (Sussman, Dent, and Stacy, 2002). We hypothesized the following: (H1) PBC would inversely associate, and PubBC would positively associate with past 30-day substance use after controlling for demographic covariates and dispositional variables (e.g., stress, anxiety, and depression) using cross-sectional baseline data; (H2) the association between PubBC and substance use would differ by gender; the effect of PubBC on substance use would be stronger for females than for males; and (H3) these associations would remain consistent in one-year longitudinal models predicting substance use.

Methods

Subjects and Procedures

Prior to the pretest measurement, 1,220 students within 18 AHS classes in California were invited to participate in the study. At pretest, consent to complete the survey was obtained from 1,037 students (85% retained; see Sussman, Sun, McCuller, and Dent, 2003 for detailed study methods). Nonparticipation was mainly due to class absenteeism. No statistical differences were found between the full baseline sample and the consenting sample. Trained data collectors informed subjects that participation was completely voluntary, confidentiality was emphasized, and subjects were administered consent forms to take home to their parents for approval. Prior to the pretest survey administration, students were required to have their parents' signature and return an Internal Review Board-approved consent form providing written permission or refusal for participation. After both student assent and parent consent were obtained, during one class period, students were administered a 20-page self-report questionnaire with a wide range of items relating to substance use behaviors and dispositional characteristics. One-year follow-up surveys were administered by telephone or mail, in which, it was possible to survey 69% ($N = 716$) of the students originally surveyed at pretest.

Measures

Current Drug Use—Past 30-day drug-use frequency of cigarette, alcohol, marijuana, cocaine, hallucinogens, stimulants, inhalants, and other drugs (i.e., depressants) was measured. Responses to the last five drug categories (cocaine through other drugs) were summed to form a hard drug-use index (Chronbach's $\alpha = 0.82$). The question used was "how many times have you used each of the following drugs in the last 30 days?" Responses were given on 11-point rating scales for each drug type. Responses ranged from "0" followed by subsequent increasing intervals of 10 (e.g., "1–10 times," "11–20 times") with the last (11th) category being "91–100 times." In the present analyses, each of the substance use outcomes was dichotomized into any use (1) or no use (0) in the last 30 days due to positively skewed distributions.

Body Consciousness—The Body Consciousness Questionnaire (BCQ) is a self-report instrument measuring PBC and PubBC (Miller et al., 1981). The four PBC items measured in this study included the following: “I am sensitive to the muscular tension in my body,” “I can often feel my heart beating,” “I am quick to sense the hunger contractions of my stomach,” and “I’m very aware of changes in my body temperature” (Chronbach’s $\alpha = 0.62$). The four PubBC items measured in this study included the following: “It’s important to me that my skin looks nice,” “I am very aware of my best and worst facial features,” “I think a lot about my body build,” and “I am concerned about my posture” (Chronbach’s $\alpha = 0.78$). All items had four response categories ranging from (1) extremely untrue to (5) extremely true.

Demographic Covariates—Demographic variables measured and controlled for in the analyses included ethnicity, gender, socioeconomic status (SES), and age (in years). SES was measured by a proxy of parent education which was the highest grade level completed by either the father or mother ranging from (1) not completed eighth grade to (6) completed graduate school. Ethnic groups were collapsed into Hispanic (coded 1) or other (coded 0) because Hispanics were the largest ethnic category.

Dispositional Covariates—Three previously identified dispositional covariates were adjusted for in our regression models because they have an established relationship to adolescent substance use. Thus, to determine if PBC and PubBC were dispositional variables that accounted for additional variance in substance use, we controlled for stress, depression, and anxiety as measured below.

Stress—The perceived stress scale (PSS) (Cohen, Kamarck, and Mermelstein, 1983) indicates the degree to which respondents appraise situations in the past month as stressful. Three measures were adapted from the original scale, each with four response categories ranging from (1) never to (4) all of the time. Measures included the following: “I have been upset because of something that happened,” “I have felt unable to control the important things in my life,” and “I have felt nervous and stressed” (Chronbach’s $\alpha = 0.77$).

Depression—Five items from the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) were used to measure past seven-day depression including five items with four response categories ranging from (1) less than 1 day to (4) 5–7 days. Measures included the following: “I felt that I could not shake off the blues even with help from my family or friends,” “I had trouble keeping my mind on what I was doing,” “I thought my life had been a failure,” “I felt fearful,” and “I felt lonely” (Chronbach’s $\alpha = 0.80$).

Anxiety—Thirteen items were adapted from the STAI-T measure to reduce respondent burden. The STAI-T is one of the most recognized measures of trait anxiety (Spielberger, 1983). Examples of the 13 items used in the current study included: “I feel that difficulties are piling up so that I cannot overcome them,” “I worry too much over something that really doesn’t matter,” and “I am inclined to take things hard.” Four response categories were used ranging from (1) do not agree to (4) strongly agree (Chronbach’s $\alpha = 0.87$).

Analysis

Statistical analyses were conducted using SAS 9.1 software (SAS Institute Inc., 2006). Only subjects with complete pretest data were retained in the analyses (N after missing case deletion = 976; 94% retained). Independent variables were centered on their respective school mean and standardized (Singer, 1998). Multilevel logistic regression analyses were conducted using Proc Glimmix to account for students nested within schools (Singer, 1998).

to obtain accurate standard estimates. The underlying equation for the two-level multilevel regression logit model, with students (level 1) nested within schools (level 2), is: $\log[p_{ij}/(1-p_{ij})] = \beta_0 + \beta_1(\text{age})_{ij} + \beta_2(\text{ethnicity})_{ij} + \dots \beta_{xij} + \mu_j$. This equation models the probability of the response of 1 using a logit link function accounting for student level explanatory variables (x_{ij}) for student i at school j , accounting for school level random effects (μ_j) (see Guo and Zhao, 2000). Models examining the relationship between substance use and body consciousness were stratified by gender, and controlled for demographic covariates: anxiety, depression, and stress. Regression models were computed using cross-sectional data from baseline. In addition, subsequent regression models were run using one-year longitudinal data. All one-year prediction models controlled for dependent variable scores at baseline. Attrition analyses were conducted using independent t -tests and chi-square to determine differences between subjects lost to follow-up at one-year ($N = 562$) compared to the full baseline sample.

Results

Attrition analyses for longitudinal analyses comparing those subjects with complete data to those lost to follow-up showed no difference on all variables under investigation except for gender, which indicated males were more likely to be lost to follow-up. The multilevel regression variance estimates for the unconditional means models for each drug-use category showed that it was important to use multilevel modeling to account for student substance use variation between schools (intraclass correlation (ICC) range for substance use outcomes = 0.01 to 0.03; see Murray et al., 1994). Descriptive sample statistics are presented in Table 1. The majority of the sample was composed of males (57.6%) and those of Hispanic descent (50.7%). The prevalence of cigarette, alcohol, and marijuana use were all over 50%, and hard-drug use approached a prevalence of 30%.

Table 2 below provides both cross-sectional and longitudinal logistic regression odds ratios with corresponding 95% confidence intervals for each substance use category. Among females, after controlling for stress, depression, and anxiety, PBC was positively (OR = 1.52, CI = 1.13–2.04), and PubBC was inversely (OR = .78, CI = .58–1.04, $p < .10$) associated with hard substance use at baseline. This association between PBC and hard substance use yielded a stronger coefficient than the marginal association between depression and hard substance use (OR = 1.27, CI = .97–1.67, $p < .10$). After controlling for baseline substance use, the association between PubBC and hard substance use remained for females: PubBC inversely predicted hard substance use one year later (OR = .66, CI = .47–.94). As would be expected, baseline substance use was the strongest longitudinal predictor of substance use one year later for each drug type for both males and females.

Among males, after controlling for demographic covariates, stress, anxiety, and depression, PBC (OR = 1.34, CI = 1.10–1.63) was positively, and PubBC (OR = .79, CI = .65–.96) was inversely associated with cigarettes use at baseline (see Table 3). The strength of the coefficient between PBC and cigarette use was comparable to the association between depression and cigarette use (OR = 1.37, CI = 1.05–1.78), and stress and cigarette use (OR = 1.43, CI = 1.14–1.78). No other substance use categories were significantly associated with either PBC or PubBC for males at baseline. In longitudinal analyses, males reported a marginally significant association between PubBC and alcohol use (OR = 1.42, CI = 1.01–2.03, $p < .10$), and PubBC and marijuana use (OR = 0.73, CI = 0.52–1.01, $p < .10$).

Discussion

This study identified both PBC and PubBC as relevant dispositional variables in substance use etiology among high-risk adolescents. This study also elucidates gender-specific

relationships between body consciousness and substance use. In cross-sectional analyses of baseline data, both PBC and PubBC accounted for additional explainable variance in cigarette use for males and hard substance use for females beyond previously established dispositional variables (i.e., anxiety, depression, and stress). Moreover, for females, PubBC inversely predicted hard substance use one year later. For males, a positive trend was found between PubBC and alcohol use, and a negative trend was found for PubBC and marijuana use. The significant effects for both males and females are substantial considering the longitudinal models controlled for baseline substance use, which accounts for the majority of the explainable variance in future substance use.

These findings provide interesting new evidence that somewhat contradict our initial hypotheses. Since PBC was positively associated with hard substance use for females and cigarette use for males, reverse causality may be inherent. For example, both cigarette use and the hard substance use index contain psychoactive stimulants. Thus, those using these substances may be more attuned to PBC due to the pronounced physiological effects caused by the stimulant. This notion is supported by the inability of PBC to predict the use of these substances one year later. It is also possible that those high on PBC require less amounts of a substance to feel an effect (Fenigstein, 1975) and suffer fewer substance-related outcomes (e.g., cough, fatigue) leading to positive expectancies of future drug use. However, since PBC did not predict drug use one year later, this association may change over time with continued substance use.

The inverse association between PubBC and substance use for both males and females suggests a role of substance use on self-image. For example, students who perceive substances to have a negative impact on their self-image and social acceptance may abstain from substance use. This notion was especially supported for females who were less likely to use hard substances when scoring higher on PubBC. This also supports the notion that females are more self-conscious about their body image (Fredrickson and Roberts, 1997), and that these gender differences lead to unique associations between PubBC and substance use (Miller et al., 1991). The marginal findings for PubBC, alcohol, and marijuana use among males need further investigation; however, the social image literature may help explain these findings. For example, alcohol is a more socially acceptable behavior among high school students than other substance use and is associated with positive social-image, especially among males (Chassin, Tetzloff, and Hershey, 1985). Conversely, adolescent males with higher PubBC may be less likely to use marijuana because of their higher concern for personal reputation. A recent review found that compared with adolescents identifying themselves with high-risk peer groups (e.g., Druggies), adolescents with higher perceived popularity (e.g., Socials) were less likely to use marijuana (Sussman, Pokhrel, Ashmore, and Brown, 2007).

The findings of this study may be limited. Since AHS students are known to display more high-risk behaviors, and peer groups are less diverse than regular high school students, factors that influence substance use and body consciousness may differ across these contexts. Our findings are not generalizable beyond the AHS context. Further studies are needed with both regular high school and AHS students.

Conclusions

The findings of this study point to important new possibilities in adolescent substance use etiology regarding dispositional variables. Dispositional variables have been important to identify students at risk for substance use and to tailor substance prevention and treatment programs accordingly. As indicated by this study, body consciousness accounts for variance in specific substance use categories and differs across gender. Drug prevention programs

and future research may benefit from further exploration of the way youth interpret and react to their bodies.

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Biographies

David Black, M.P.H., is a fourth-year doctoral student at the University of Southern California Keck School of Medicine. He has previously worked in the area of adolescent substance use and violence etiology. His most recent research interest is the study of mindfulness in the context of adolescent and young adult risk behavior. He is interested in the neurocognitive and emotional processes that are influenced by both the disposition of mindfulness and the practice of mindfulness over time. He is currently conducting a pilot study that examines the association between mindfulness, working memory, and health behavior among medical students. Outside of research, David has a deep affinity for nature and enjoys camping, hiking, and also writing about nature.

Steve Sussman, Ph.D., FAAHB, FAPA, received his doctorate in social-clinical psychology from the University of Illinois at Chicago in 1984. He is a professor of preventive medicine and psychology at the University of Southern California. He studies etiology, prevention, and cessation within the addictions arena, broadly defined. He has over 345 publications. His projects include Towards No Tobacco Use, Towards No Drug Abuse, and Project EX, which are considered model programs at numerous agencies (i.e., CDC, NIDA, NCI, OJJDP, SAMSHA, CSAP, Colorado and Maryland Blueprints, Health Canada, U.S. Department of Education and various State Departments of Education). He received the honor of Research Laureate for the American Academy of Health Behavior in 2005, and he was President there (2007–2008). Also, as of 2007, he received the honor of Fellow of the American Psychological Association (Division 50, Addictions). As of 2010, he will be the Editor of Evaluation & the Health Professions.

Jennifer Unger, Ph.D., is a professor at the Claremont Graduate University School of Community and Global Health. Her research focuses on psychosocial and cultural predictors of substance use and other health-related behaviors among adolescents, including

acculturation, cultural values, peer influences, family influences, and stressful life events. Dr. Unger is conducting several large-scale studies of adolescents' health behaviors across cultural contexts.

Pallav Pokhrel, Ph.D., is a researcher with the Cancer Research Center of Hawaii Prevention and Control Program, University of Hawaii. His primary area of research interest includes self-regulation in the context of adolescent substance use behavior.

Ping Sun, Ph.D., graduated in 1999 from the Institute for Health Promotion and Disease Prevention, USC. He has been working on studying the etiology of substance use and intervention among youth. His most recent research interest is exploring the genetic and environmental risk factors of the general propensity of addiction, which may be reflected as substance use or process addiction.

Table 1

Sample characteristics and observed range of student responses

Variable [observed range]	% (N = 976)	Mean (SD)
Age		16.8(0.8)
Gender (female)	42.4	
Ethnicity		
Asian	6.1	
Black	9.5	
Hispanic	50.7	
White	30.5	
Other	3.2	
Substance use (past 30 days)		
Cigarettes	56.3	
Alcohol	62.4	
Marijuana	53.4	
Hard	29.5	
SES [1–6]		3.4(1.3)
PBC [1–5]		3.3(0.9)
PubBC [1–5]		3.9(1.0)
Anxiety [1–4]		2.0(0.6)
Depression [1–4]		1.7(0.7)
Stress [1–4]		2.3(0.8)

Table 2

Odds ratios and 95% confidence intervals for female substance use at baseline and one-year follow-up

Variable	Baseline (N = 414)				One-year follow-up (N = 196)			
	Cigarettes	Alcohol	Marijuana	Hard	Cigarettes	Alcohol	Marijuana	Hard
Intercept	ns	ns	ns	0.39(0.25–0.61)	0.28(0.13–0.59)	0.32(0.16–0.66)	0.23(0.11–0.51)	0.03(0.01–0.06)
Age	ns	ns	0.78(0.64–0.96)	ns	ns	ns	ns	ns
Ethnicity ^a	0.48(0.30–0.75)	ns	0.60(0.39–0.92)	ns	ns	ns	0.54 [*] (0.27–1.07)	3.52(1.72–7.16)
SES	1.37(1.09–1.71)	1.32(1.05–1.65)	ns	1.26 [*] (1.01–1.60)	ns	ns	ns	ns
Anxiety	ns	ns	ns	ns	ns	ns	1.60(1.03–2.48)	ns
Depression	ns	ns	ns	1.27 [*] (0.97–1.67)	ns	1.49 [*] (0.99–2.24)	ns	ns
Stress	ns	ns	ns	ns	ns	ns	ns	ns
PBC	ns	ns	ns	1.52(1.13–2.04)	ns	ns	ns	ns
PubBC	ns	ns	ns	0.78 [*] (0.58–1.04)	ns	ns	ns	0.66(0.47–0.94)
Drug use ^b	—	—	—	—	9.83(4.52–21.16)	7.34(3.43–15.58)	6.43(3.05–13.52)	6.37(3.20–12.63)

^{*} $p < .10$;

^a Estimate is provided for Hispanic ethnicity coded as 1 relative to other coded as 0;

^b one-year follow-up models control for the same type of drug use at baseline.

Table 3

Odds ratios and 95% confidence intervals for male substance use at baseline and one-year follow-up

Variable	Baseline (N = 567)				One-year follow-up (N = 218)			
	Cigarettes	Alcohol	Marijuana	Hard	Cigarettes	Alcohol	Marijuana	Hard
Intercept	1.88(1.40–2.25)	2.12(1.52–2.95)	1.85(1.44–2.37)	0.45(0.32–0.63)	0.32(0.17–0.63)	0.50(0.27–0.94)	0.18(0.09–0.38)	0.10(0.05–0.20)
Age	ns	ns	ns	ns	ns	ns	0.74 [*] (0.54–0.99)	0.62(0.44–0.90)
Ethnicity ^a	0.67(0.46–0.98)	ns	0.58(0.40–0.84)	ns	0.52 [*] (0.27–1.0)	ns	ns	ns
SES	ns	ns	ns	ns	1.58(1.09–2.30)	1.49(1.01–2.18)	ns	ns
Anxiety	0.79 [*] (0.62–1.01)	0.75(0.59–0.95)	ns	ns	0.60(0.37–0.97)	ns	ns	ns
Depression	1.37(1.05–1.78)	1.31(1.01–1.71)	ns	1.48(1.17–1.89)	ns	ns	0.53(0.36–0.79)	ns
Stress	1.43(1.14–1.78)	1.34(1.07–1.70)	1.24 [*] (1.00–1.53)	ns	ns	ns	ns	1.64(1.05–2.59)
PBC	1.34(1.10–1.63)	ns	ns	ns	ns	ns	ns	ns
PubBC	0.79(0.65–0.96)	ns	ns	ns	ns	1.42 [*] (1.01–2.03)	0.73 [*] (0.52–1.01)	ns
Drug use ^b	—	—	—	—	12.92(6.30–26.56)	7.61(3.70–15.65)	6.94(3.37–14.37)	3.16(1.63–6.13)

^{*} $p < .10$;

^a Estimate is provided for Hispanic ethnicity coded as 1 relative to other coded as 0;

^b one-year follow-up models control for the same type of drug use at baseline.