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## Characteristics of Social Smoking Among College Students

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### Abstract

Social smoking is a newly identified phenomenon in the young adult population that is poorly understood. We investigated differences in social smoking (smoking most commonly while partying or socializing) and other smoking within a convenience sample of college smokers ( $n = 351$ ) from a large midwestern university. Results revealed that 70% of 351 current (past 30-day) smokers reported social smoking. No significant difference was found in motivation to quit between smoking groups. However, a significant difference was found between groups in confidence to quit, the number of days smoked, and the number of cigarettes smoked on those days. More social smokers than expected did not perceive themselves as smokers. Logistic regression analysis revealed that lower physical and psychological dependence and higher social support scores predicted social smoking.

### Keywords

smoking; students; universities

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Since the Surgeon General's report on smoking in 1964, the health effects of cigarette smoking have been well documented, yet people continue to smoke and initiate smoking. Tobacco use, particularly cigarette smoking, is the leading preventable cause of death in the United States and is responsible for approximately 440,000 deaths each year.<sup>1</sup> Of these deaths, most are caused by lung cancer, cardiovascular disease, and chronic airway obstruction.<sup>1</sup> In addition to cancer and cardiovascular disease, smoking is a risk factor for emphysema, diabetes, upper respiratory infections, and bronchitis<sup>1</sup>, and affects nearly every organ of the body.<sup>2</sup> Furthermore, it is estimated that smoking causes approximately \$157 billion in annual health-related economic costs, and this number is projected to increase.<sup>2</sup> Although it is unclear whether the prevalence of smoking among college students has stabilized after increasing from 22% in 1990 to 28% in 1997,<sup>3,4</sup> recent data suggest that students may be smoking more cigarettes per day than they did previously.<sup>5</sup>

Discussions at sessions at recent tobacco and health conferences,<sup>6–8</sup> as well as results reported in recent articles in the literature,<sup>7,9–11</sup> indicate that there is a newly recognized phenomenon of social smoking among young adult cigarette smokers. Many college health professionals report having students say “I only smoke when I go out” or “I only smoke socially,” in response to smoking status questions. Focus groups with college students have revealed that some students identify that they smoke “only socially,” and that they perceive themselves as different from other smokers.<sup>12</sup> In addition, data suggest that more than one-third of all students who smoked in the past 30 days did not consider themselves smokers.<sup>13</sup> Despite this recent recognition, there has been little research on social smoking and how social smokers differ from other smokers.

Study results have indicated that the social environment is an important factor in cigarette smoking. A social context has been shown to be an important factor in the initiation of smoking,<sup>6</sup> as well as becoming an established smoker.<sup>14–15</sup> Tobacco industry researchers place great emphasis on how social environments can encourage increased consumption of cigarettes because these social activities are of great importance to young adults.<sup>16</sup> Therefore, the tobacco companies target social environments attended by young adults, thus associating smoking with social activities.<sup>8,16</sup>

A characteristic of social smokers lies in the perception of their own smoking behavior. Qualitative studies performed by the tobacco industry have indicated that those who socially smoke see themselves as being in control of their smoking and in denial that their behavior may be an addiction or habit.<sup>8</sup> Researchers who conducted other qualitative interviews of young adult social smokers (those who smoke only in social situations) in California present parallel findings.<sup>8</sup> Participants in those interviews indicated that smoking in social situations provides an instant conversation starter and an immediate bond with strangers. Furthermore, the participants believed they had found a way to smoke without the social stigma and health effects.<sup>8</sup> Moran et al.<sup>7,11</sup> found that social smokers are more likely to be (1) occasional smokers (nondaily), (2) not regular smokers when starting college, (3) involved in student organizations, (4) less motivated to quit, and (5) making higher grades.

One challenge to understanding social smoking is that this term is not clearly or consistently defined in the literature. Social smoking among college students has been defined as those who smoke more commonly with others rather than alone.<sup>7,11</sup> Other definitions of social smoking in the literature include those who smoke almost exclusively in social situations,<sup>6</sup> those who smoke only in social situations,<sup>8</sup> those who smoke a large proportion of their cigarettes when they go out to “hospitality venues,”<sup>10</sup> and those who smoke only at festivities.<sup>17</sup> These definitions indicate that social smoking is a situational event involving others; therefore, in this study, we define social smokers as those who most commonly smoke while partying or socializing.

Our purpose in this study was to investigate differences between college students who engage in social smoking and other smoking. We explored whether social and other smokers differed in motivation and confidence to quit, rate of smoking, and perception of themselves as “smokers.” In addition, we investigated characteristics that predicted social smoking. Our goal was to increase understanding of social smoking so prevention and cessation programs could be modified for this group of college students.

## METHODS

### Subjects and Procedures

A convenience sample of college students was recruited at a large midwestern university from January to May of 2001 and 2002. In 2001, all undergraduate students who elected to earn

partial research credit for psychology classes completed screening questions, and smokers (defined as any smoking in the past 30 days) and a random selection of 140 nonsmokers were invited to complete an additional 296-item survey to earn more research credit. In 2002, all students in introductory psychology classes were invited to participate in the survey using a Web-based signup system. The recruitment method used introductory psychology classes to intentionally over-sample freshman and sophomores to allow for the addition of follow-up assessments to track changes in smoking over time.

During 2001 and 2002, 1,123 students were invited to participate through e-mails, phone calls, signup sheets, and a scheduling Web site (in 2002 only). In total, 66% (741) of students who were invited to participate signed consent forms and completed surveys. For these analyses, we included the 360 students who reported smoking on one or more days of the past 30. We removed 9 participants who did not answer the social smoking question, resulting in a final sample size of 351 smokers. The university's Institutional Review Board granted approval for this study.

## Measures

To categorize smokers, we asked the following question:

What are you doing most commonly when you smoke? Rank the 3 most common activities you are doing when you smoke. "1" is the most common, "2" is the next most common, etc. If you do fewer than 3 activities while you smoke, rank only those activities.

The 7 response categories for this question included "partying or socializing," "studying," "driving," "watching TV," "eating," "relaxing after a meal," and "other, specify." We defined social smokers as those who ranked partying and socializing as their first response. We coded all other responses as "other smoking."

We modified questions regarding frequency and rate of smoking ("During the past 30 days, on how many days did you smoke?" "During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?") from the National College Health Risk Behavior Survey.<sup>18</sup> We modified the questions assessing motivation to quit ("On a scale of 0–10, how motivated are you to quit smoking?") and confidence to quit ("On a scale of 0–10, how confident are you that you could quit smoking if you wanted to?") from Miller and Rollnick's counseling model.<sup>19</sup>

We used demographic questions from 2 instruments. The class-standing question came from the Core Alcohol and Drug Survey.<sup>20</sup> We used questions regarding age, gender, racial/ethnic identity, and place of residence from the National College Health Risk Behavior Survey.<sup>18</sup>

To measure physical dependence on nicotine, we used the Fagerström Test for Nicotine Dependence questionnaire (FTND).<sup>21</sup> The FTND scale consists of 6 self-report items that assess physical dependence on nicotine. Scores range from 0–10, with higher scores indicating higher physical dependence. Internal consistency estimates are 0.61 for the FTND questionnaire; biochemical measures are closely related to scores on the FTND scale.<sup>11,21</sup>

We measured psychological dependence with the Severity of Dependence Scale (SDS).<sup>22</sup> The SDS is a 5-item scale that measures an individual's degree of psychological dependence on drugs. We used items 1–4 in this study. Scores range from 0–11, with higher scores indicating higher psychological dependence. The reliability coefficients range from 0.8 to 0.9.<sup>22</sup> Gossop et al<sup>22</sup> established validity by making positive correlations with drug use frequency and drug dosage.

We measured global self-esteem with the 10-item Rosenberg Self-Esteem Questionnaire (RSE).<sup>23</sup> Scores range from 0–30, with higher scores indicating higher global self-esteem. Coefficient alphas for the RSE are reported to be 0.88 to 0.90<sup>24</sup> and 0.72 to 0.88.<sup>25</sup> Test-retest data is reported as 0.82 over 1- and 2-week intervals and 0.63 and 0.50 over 6- and 12-month intervals.<sup>25</sup>

We measured depression with the 20-item Center for Epidemiologic Studies-Depression Scale (CES-D).<sup>26</sup> Scores range from 0–60, with higher scores indicating the degree of depressive symptomatology. The alpha coefficient for the CES-D was 0.85 in a general population and 0.90 in a patient population.<sup>26</sup> Test-retest reliability estimates were: 0.51 at 2 weeks, 0.67 at 4 weeks, and 0.59 at both 6- and 8-week intervals.<sup>26</sup> Validity estimates have been provided in studies showing positive correlations with the Hamilton Clinician's Rating Scale (1960) and with the Raskin Depression Scale (1969), which are clinician rating scales.<sup>27</sup>

To measure perceived availability and function of social resources, we used the 40-item Interpersonal Support Evaluation List (ISEL).<sup>28</sup> Scores range from 0–40, with higher scores indicating higher perceived social support. Internal reliability estimates have been reported to range from 0.88–0.90 for the general population.<sup>28</sup> Test-retest reliability is 0.87 for 2 days and 4 weeks. We established validity through correlations with other scales, such as Barrera, Sandler, and Ramsay's<sup>29</sup> (1981) Socially Supportive Behaviors Scale and with the Involvement and Social Support Scale (ISSB) by R. Moos and D. Moos in the Moos University Residence Environment Scale ( $r = .62$ ).<sup>28</sup>

Personality ranges were measured by 2 factors of the Zukerman-Kuhlman Personality Questionnaire (ZKPQ),<sup>30</sup> the ImpSS (impulsive sensation seeking) and N-Anx (neuroticism anxiety). The 19-item N-Anx factor describes emotional upset, tension, worry, fearfulness, obsessive indecision, lack of self-confidence, and sensitivity to criticism, whereas the 19-item ImpSS factor describes a lack of planning and tendency to act impulsively without thinking.<sup>31</sup> Both scales have a score range of 0–19. The N-Anx factor is correlated ( $r = .68$ ) with the emotionality subscale of the Emotionality, Activity, Sociability, Impulsivity (EASI) temperament scales, and the ImpSS subscale is correlated ( $r = .70$ ) with the impulsivity subscale of the EASI.<sup>31</sup>

### Statistical Analysis

We entered data into Microsoft Access 2000<sup>32</sup> and verified using double-data entry methods, which call for manual review of the original surveys to correct inconsistencies. We analyzed data using SPSS statistical software,<sup>33</sup> and we performed logistic regressions using SAS.<sup>34</sup>

## RESULTS

Overall, 70% of the college smokers in our sample reported social smoking (Table 1). The sample consisted primarily of freshmen (68.01%), those living in on-campus housing (67.6%), and those who reported their ethnicity as white (93.4%). Men represented 52.9% of the total sample, and ages ranged from 18–27 years old, with a mean age of 19.3 years. Chi-square analysis revealed that more social smokers (30.89%) than other smokers (6.8%) were members of either a social fraternity or sorority,  $\chi^2(1, N = 349) = 23.260, p < .0001$ . We found no other demographic differences between groups.

Table 1 indicates that the smoking characteristics of the groups differed. Social smokers reported greater confidence in quitting ( $M = 8.60, SD = 2.08$ ) than did other smokers ( $M = 6.71, SD = 3.10$ ),  $t(350) = -5.68, p < .0001$ , but no significant difference was found in motivation to quit between social ( $M = 4.38, SD = 3.24$ ) and other smokers ( $M = 4.49, SD = 3.06$ ),  $t(351) = .29, p = .77$ . Social smokers reported smoking on fewer days ( $M = 16.47, SD$

= 11.10) than did other smokers ( $M = 25.04$ ,  $SD = 8.89$ ),  $t(351) = 7.64$ ,  $p < .0001$ , and they smoked fewer cigarettes on those days ( $M = 5.18$ ,  $SD = 4.81$ ) than did the other smoking group ( $M = 9.48$ ,  $SD = 7.21$ ),  $t(351) = 5.58$ ,  $p < .0001$ . Furthermore, more social smokers than we expected (47.4%) did not consider themselves smokers  $\chi^2(1, N = 349) = 29.748$ ,  $p < .0001$ .

We constructed a logistic regression model to predict social smoking. We suggested 7 predictor variables (psychological dependence, physical dependence, global self-esteem, depression, social support, impulsive-sensation seeking, and neuroticism anxiety) be entered into the full model. Two variables, self-esteem and neuroticism-anxiety, had high correlations with other variables (from  $-.669$  to  $.63$ ). We removed these variables from the full model to reduce the likelihood of multicollinearity. A Wald test for the global utility of the full model (Table 1) was significant,  $\chi^2(5, N = 348) = 48.3110$ ,  $p < .0001$ , indicating that the predictors, as a set, reliably distinguished between the social smoking and other smoking group. The correct classification rate was 34.0% for the other smokers and 91.4% for social smokers, with an overall rate of 74.1 %.

A reduced model (Table 2) was proposed using the stepwise selection procedure ( $p > .05$ ). Using the Wald criterion, we retained only psychological dependence, physical dependence, and perceived social support scores in the final model,  $\chi^2(3, N = 348) = 46.1177$ ,  $p < .0001$ . The model correctly classified 73.3% of all participants into smoking groups, 35.9% of other smokers, and 91.0% of those who reported social smoking. As Table 2 indicates, a 1-unit increase in physical dependence results in a 28.2% decrease in the odds of social smoking. A 1-unit increase in the psychological dependence similarly results in a 15.1% decrease in the odds of social smoking, and each 1-unit increase in perceived social support is associated with an 8.1 % increase in the odds of social smoking. Bivariate scatterplots of the 3 significant predictors revealed that the social smoking group tended to cluster together whereas other smokers were scattered throughout the range of results. This may indicate that the social smoking group displays more similar characteristics than do other smokers and may help further explain the logistic regression results in which only 35.9% of other smokers were classified correctly.

## COMMENT

More than two-thirds of college smokers are social smokers, and many social smokers do not perceive themselves as being smokers. Although we found no differences between groups with regard to motivation to quit, both groups were only moderately motivated to quit. However, social smokers did report more confidence in quitting than did other smokers. Lower physical and psychological dependence and higher social support are important factors in predicting social smoking among college students. To our knowledge, this study is the first in the published literature to describe and predict social smoking among college students. Although researchers have established that the social environment is an important factor in predicting cigarette smoking,<sup>15,35,36</sup> they had not explored the importance of social environment for social smoking.

Moran et al<sup>7,11</sup> found a lower prevalence of social smoking compared with the current study (51% vs 70.4%). Although the definition we used was consistent with other definitions of social smoking, it was not identical to the one used by Moran et al<sup>7,11</sup> (ie, those who smoke more commonly with others than alone). Therefore, the current study may have captured a slightly different group of college social smokers. For both definitions of social smoking, the students' sense of their own disposition (eg, shy, social) may influence their perception of when they smoke, which may or may not reflect their actual behavior. A fine analysis of the activities students engage in while smoking, using tools such as Ecological Momentary Analysis (EMA),<sup>37,38</sup> would further researchers' understanding of social smoking. We also found that more

social smokers than other smokers were members of either a social fraternity or sorority. This may be because students who are interested in joining fraternities and sororities may already be more social and thus self-select into them.

Although Moran et al<sup>7,11</sup> reported that social smokers were less motivated to quit, we found no significant differences among the smoking groups. This inconsistency may be explained by the way we assessed motivation to quit. In the Moran study, the authors assessed motivation to quit by Prochaska and DiClemente's 5-item Stages of Change scale,<sup>39</sup> whereas in this study, we assessed motivation to quit by asking the participants to rate their motivation on a scale of 0–10. Of concern in this study is that both groups were only moderately motivated to quit. This lack of motivation may be related to the perceived low health risk associated with smoking. Consistent with this hypothesis is that 1 predictor of social smoking among adolescents was their viewing smoking as “not very risky.”<sup>17</sup> Light smokers also have reported being less likely to perceive increased personal risk of cancer and heart disease.<sup>40</sup> Perhaps because young adult smokers are unlikely to experience severe health effects, such as emphysema, lung cancer, or cardiovascular disease,<sup>41</sup> they are less concerned with the health effects of smoking and therefore are less interested in quitting.

We found that social smokers smoked on fewer days than did other smokers, which was similar to the findings of Moran et al<sup>7,11</sup> that social smokers were more likely to be nondaily smokers. We also found that social smokers smoked fewer cigarettes on those days than did other smokers. However, researchers<sup>42–44</sup> have consistently shown that even low levels of cigarette smoking can have adverse health effects.<sup>42–44</sup> These lower levels of smoking may partly explain social smokers' high confidence that they could quit smoking.

Our data corroborate findings from qualitative studies in which researchers<sup>8,12</sup> found that many social smokers do not perceive themselves as smokers. Those who report social smoking may be using social situations as a means of support to make the behavior more socially acceptable. In addition, they may feel that smoker is a term for someone who smokes heavily, daily, or for longer periods of time. The finding that social smokers do not consider themselves smokers raises a number of practical concerns regarding treatment and prevention practices. Traditional smoking prevention and cessation messages may not be reaching this group of smokers. In addition, when healthcare providers ask smoking status questions (typically, “Do you smoke?”), those who smoke socially may not identify themselves as smokers and therefore miss the opportunity to be given advice to quit.<sup>13</sup>

Logistic regression results revealed that social smokers are a unique group. They were reliably classified by psychological dependence, physical dependence, and perceived social support scores. These results may facilitate understanding about what interventions may be effective for social smokers. Social support in this study measured the resources provided by other persons rather than the mere existence of social networks. However, potential effective interventions may exist within the social networks of college social smokers. Students who are more likely to progress from experimenting to established smoking in college think their peers approve of smoking.<sup>45</sup> Promoting the social unacceptability of social smoking may result in increased support for social smokers to quit. Restricting smoking in places where students socialize (eg, bars, restaurants, house parties) may be particularly important to reducing social smoking in college.

Social smokers tended to score lower on the psychological and physical dependence scales. This is consistent with our results that indicate social smokers smoke fewer cigarettes than do other smokers. Individuals who smoke socially may rely on thinking that they can quit easily at any time because they are less dependent. The literature supports this idea in that the fewer cigarettes that are smoked by adolescents, the more likely they are to believe that they probably

or definitely will not be smoking in 5 years.<sup>46</sup> Social smokers may also intentionally lower their smoking rate to decrease the health risks associated with higher rates of smoking.<sup>8,47</sup>

It is estimated that fewer than 10% of smokers are able to smoke occasionally on a nondaily basis.<sup>48</sup> Thus, given that nearly 70% of this college sample exhibited social smoking behavior, and that social smokers exhibited lower dependence, it is possible that social smoking may be a transition period to regular smoking behavior. Between 33% and 50% of people who try smoking cigarettes escalate to regular patterns of use.<sup>46</sup> Among college students, 90% of daily smokers and 50% of nondaily smokers continue to smoke over 4 years.<sup>49</sup> In addition, tobacco industry marketers focus on key transition periods to move smoking from a social means of connecting with peers to becoming a habitual response to stress or boredom.<sup>16</sup> Therefore, it is essential that targeted cessation interventions be directed toward members of this group before they progress to regular smoking.

### Limitations

One of the limitations of this study lies in the definition of social smoking. To date, there is no standard way of defining social smoking, which may lead to inconsistent research findings. Consensus on the definition of social smoking will help advance future research endeavors. We intentionally over-sampled freshmen and sophomores, and our sample was not selected at random. Therefore, it is unclear whether having a more diverse population with regard to class or a completely random sample would have resulted in different findings. Also, because smoking rates are generally higher among young adults who are not attending college,<sup>50</sup> generalizations to the noncollege population should be made with caution. Finally, data were not collected prospectively and the cross-sectional design does not allow us to draw conclusions regarding causality.

### Recommendations for Future Research

Longitudinal studies that include qualitative and quantitative measures are needed to identify behavioral and psychosocial differences between social smoking and nonsocial smoking groups. Furthermore, longitudinal studies are needed to find out whether social smoking is a stage of progression that results in regular smoking among young adults.

Studies are needed in which researchers assess motivation to quit among college students who smoke. Beyond just assessing their motivation to quit, it is imperative that strategies and interventions to increase motivation to quit be studied.

We further recommend the study of effective marketing strategies for the prevention of social smoking. It is clear that social smoking represents a unique population; however, it is unknown what marketing messages with regard to quitting reach this population.

Furthermore, we recommend studying the way smoking status questions are asked during healthcare provider visits. If a smoking status question is asked in the same manner as in this study, it is clear that many of those who smoke socially will say “no” when asked if they are a smoker. However, it is unclear if the way the question is asked will result in a different answer. Finally, we recommend that the literature provide a standard way of assessing and defining social smoking. This can result in more consistent research findings and a greater understanding of this group of smokers.

A substantial amount of information is known about the addictive qualities of tobacco, yet little is known about smoking among young adults or how to help them quit.<sup>51</sup> Social support and psychological and physical dependence were significant predictors in this study and are likely to play an important role in social smoking. As more becomes known about social smoking

among college students and young adults, healthcare providers can continue to develop or modify programs that are directed toward helping young adult smokers quit.

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**TABLE 1**  
 Characteristics of Sample of College Students Who Reported Smoking 1 or More Days of the Past 30 Days

Characteristic	Social smokers			Other smokers			P*
	M	SD	n %	M	SD	n %	
All current smokers			247 70.4			104 29.6	
Gender							.73
Male			131 53.5			53 51.5	
Female			114 46.5			50 48.5	
Age	19.3	1.2		19.5	1.5		.13
Racial/ethnic identity							.92
White			230 93.5			96 93.2	
Non-white			16 6.5			7 6.8	
Class							.61
Freshman			170 69.7			66 64.1	
Sophomore			47 19.2			26 25.2	
Junior			17 7.0			6 5.8	
Senior			10 4.1			5 4.9	
Housing Location							.15
On-Campus			172 69.9			64 62.1	
Off-Campus			74 30.1			39 37.9	
Member of social fraternity or sorority							<.0001
Yes			76 30.9			7 6.8	
No			170 69.1			96 93.2	
Motivation to quit	4.4	3.2		4.5	3.1		.77
Confidence to quit	8.6	2.1		6.7	3.1		<.0001
Days smoked in past 30 days	16.5	11.1		25.04	8.9		<.0001
Cigarettes smoked on days	5.2	4.8		9.5	7.2		<.0001
Do you consider yourself a "smoker"?							<.0001
Yes			129 52.7			87 83.7	
No			116 47.3			17 16.3	
Psychological dependence	2.7	2.3		4.2	2.7		<.0001
Physical dependence	0.7	1.4		2.0	2.2		<.0001

Characteristic	Social smokers			Other smokers			p*
	M	SD	n	M	SD	n	
Self-esteem	23.1	4.8		22.0	6		.11
Depression	10.7	8.5		14.2	10.6		.003
Social-support	36.7	3.4		35.4	4.8		.01
Impulsive sensation-seeking	8.2	2.9		7.8	2.9		.21
Neuroticism-anxiety	6.2	4.2		7.3	5.1		.04

\* Difference between social smokers and other smokers, calculated from chi-square tests for categorical variables and *t* tests for continuous variables.

TABLE 2

Final Model Predicting Social Smoking Among Sample of College Students

Predictor	$\beta$	SE $\beta$	p	OR	95% CI
Constant	-0.968	1.122	.388	—	—
Psychological dependence	-0.164	0.053	.001	0.849	0.766-0.941
Physical dependence	-0.332	0.073	<.001	0.718	0.622-0.829
Social support	0.078	0.031	.012	1.081	1.018-1.148

Note. SE = standard error; OR = odds ratio; CI = confidence interval.