Original Investigation

The Development and Validation of a Scale Assessing Individual Schemas Used in Classifying a Smoker: Implications for Research and Practice

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Abstract

Introduction: Half of college students who have smoked in the past month do not consider themselves smokers. Understanding one's schema of smokers is important, as it might relate to smoking behavior. Thus, we aimed to develop a scale assessing how young adults classify smokers and establish reliability and validity of the scale.

Methods: Of 24,055 students at six Southeast colleges recruited to complete an online survey, 4,840 (20.1%) responded, with complete smoking and scale development data from 3,863.

Results: The Classifying a Smoker Scale consisted of 10 items derived from prior research. Factor analysis extracted a single factor accounting for 40.00% of score variance (eigenvalue = 5.52). Higher scores (range 10–70) indicate stricter criteria in classifying a smoker. The scale yielded a Cronbach's alpha of .91. Current smoking (past 30-day) prevalence was 22.8%. Higher Classifying a Smoker Scale scores ($p = .001$) were significant predictors of current smoking, controlling for sociodemographics. Higher scores were related to being nondaily versus daily smokers ($p = .009$), readiness to quit in the next month ($p = .04$), greater perceived smoking prevalence ($p = .007$), not identifying as smokers ($p < .001$), less perceived harm of smoking ($p < .001$), greater concern about smoking health risks ($p = .01$), and less favorable attitudes toward smoking restrictions ($p < .001$). Among current smokers, higher scores were related to greater smoking frequency ($p = .02$), not identifying as smokers ($p < .001$), and less perceived harm of smoking ($p < .001$), controlling for sociodemographics.

Conclusion: This scale, demonstrating good psychometric properties, highlights potential intervention targets for prevention and cessation, as it relates to smoking, risk perception, and interest in quitting.

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Introduction

Nondaily smoking has dramatically increased, particularly among young adults (Schane, Glantz, & Ling, 2009). Young adulthood is a critical transition period for cigarette use (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997; Chen & Kandel, 1995; Everett, Husten, et al., 1999; Everett, Warren, et al., 1999; U.S. Department of Health and Human Services, 1994), often involving escalation in smoking (Orlando, Tucker, Ellickson, & Klein, 2004) or late-onset smoking (Chassin, Presson, Pitts, & Sherman, 2000). Roughly 30% of youth who initiate cigarette smoking will become daily smokers (Substance Abuse and Mental Health Services Administration, 2006). In 2006, the rate of current smoking (≥ 1 cigarette in the past 30 days) for those aged 18–25 years was 35.6%–40.2% (Doll, Peto, Boreham, & Sutherland, 2004), including a rate of 28.4% among college students (Doll et al., 2004). However, only half of current smokers in the young adult population smoke regularly (i.e., ≥ 25 of the past 30 days; Doll et al., 2004), and roughly half are “social smokers” (Moran, Wechsler, & Rigotti, 2004). Unfortunately, nondaily and social smokers may discount personal health consequences (Luoto, Uutela, & Puska, 2000; Moran et al., 2004; Rollins, Malmstadt Schumacher, & Ling, 2002; Woolcock, Peat, Leeder, & Blackburn, 1984), regardless of the fact that nondaily smoking is associated with increased adverse respiratory conditions and other health problems (An et al., 2009; Woolcock et al., 1984).

Over half of college students do not consider themselves to be smokers despite having smoked in the previous 30 days (Berg et al., 2009; Levinson et al., 2007). This highlights the fact that there is great variation in how current smokers self-identify as smokers. The way people categorize smoking behaviors may be conceptualized as a schema, a mental framework centering on a

specific theme that helps us to organize social information (Bartlett, 1932). People use schemas to organize current knowledge and provide a framework for future understanding. Schema can be applied to oneself, which are then called a “self-schema,” or to others, which are then called “person schemata.” In the case of smoking, while many people engage in the act of smoking, their schema of a smoker may not align with their behavior, and thus, they may be less likely to perceive harm in their behavior or be inclined to change it (Berg et al., 2009, 2010).

Despite the importance of understanding individual schemas regarding what constitutes a smoker, very little research has been conducted on this cognitive aspect of smoking behavior or sociodemographic and smoking-related factors related to this phenomena. In prior research (Berg et al., 2009; Levinson et al., 2007), some factors have been identified as important in terms of whether college students identified themselves as smokers. For example, less frequent smoking (Berg et al., 2009; Levinson et al., 2007), being younger (Berg et al., 2009; Levinson et al., 2007), smoking socially (Berg et al., 2009; Levinson et al., 2007; Moran et al., 2004), and greater alcohol consumption (Berg et al., 2009) have been related to less likelihood of identifying as a smoker. Moreover, denying being a smoker is related to less likelihood of attempting to quit in the past 12 months, after controlling for demographic and smoking-related factors (Berg et al., 2009). Thus, understanding one’s schema may be helpful in predicting future smoking behavior, perceived harm of smoking, and intent to quit.

Despite the importance of understanding young adults’ schemas regarding what constitutes a smoker, little has been done to examine this phenomenon in detail. Recent qualitative research (Berg et al., 2010) among 73 college student smokers, 32.9% of which were regular smokers (smoked ≥ 25 of the last 30 days), examined what criteria college students use to determine who is considered a smoker. Participants described a “smoker” in terms of (a) smoking frequency, ranging from infrequently to daily; (b) contextual factors, such that smoking alone indicates being a smoker rather than smoking among others; (c) time since initiation; (d) whether one purchases cigarettes, such that “smokers” buy cigarettes while nonsmokers borrow them; (e) addiction and being able to easily quit; (f) whether smoking is habitual; and (g) personality and physical characteristics. These beliefs had implications for experiences in quitting smoking, motivation to quit (which may be influenced by perceived harm of smoking and attitudes regarding smoking [Sherman, Rose, & Koch, 2003; Shore, Tashchian, & Adams, 2000]), and perceived barriers. Many participants indicated confidence in being able to quit but believed that they were not smokers and, consequently, did not need to quit. These qualitative findings further argue for the need to more extensively understand how one classifies a smoker and how that might impact perceived harm and intent to quit smoking.

Because no measure has been developed to capture young adults’ individual schemas of a smoker, the present study builds on earlier, formative qualitative research (Berg et al., 2010) to develop a scale to assess the extent to which young adults use certain criteria in classifying a smoker. In this study, we describe the scale development and provide evidence of reliability and validity. Specifically, we examine its internal consistency, factor structure, and concurrent validity. Based on the aforementioned

prior research, we hypothesize that having more rigid, less inclusive schema of what constitutes a smoker may be associated with being a current smoker, perceived harm of smoking, less negative attitudes toward smoking, and more social exposure to smoking. We also hypothesize that, among current smokers, having more rigid, less inclusive schema of what constitutes a smoker may be associated with less frequent smoking, less readiness to quit smoking, less likelihood of recent quit attempts, not considering oneself to be a smoker, and less perceived harm of smoking.

Methods

Procedure

In October, 2010, students at six colleges in the Southeast were recruited to complete an online survey. A random sample of 5,000 students at each school (with the exclusion of two schools who had enrollment less than 5,000) were invited to complete the survey (total invited $N = 24,055$). Students received an E-mail containing a link to the consent form with the alternative of opting out. Students who consented to participate were directed to the online survey. To encourage participation, students received up to three E-mail invitations to participate. As an incentive for participation, all students who completed the survey received entry into a drawing for cash prizes of \$1,000 (one prize), \$500 (two prizes), and \$250 (four prizes) at each participating school.

Of students who received the invitation to participate, 4,840 (20.1%) returned a completed survey. Consistent with our focus on young adults who may be initiating or escalating their smoking, the present study focused on students aged 18–25 years ($N = 4,355$) who also had complete smoking data. Thus, the analyses were conducted on a final sample size of $N = 3,863$.

The Emory University Institutional Review Board approved this study, IRB# 00030631.

Measures

The newly developed instrument was administered as part of the online survey containing 230 questions assessing a variety of health topic areas, which took approximately 20–25 min to complete. For the current investigation, only questions related to demographic characteristics and smoking behavior and attitudes were included.

Demographic characteristics assessed included students’ age, gender, ethnicity, highest parental educational attainment, and relationship status. Ethnicity was categorized as non-Hispanic White, Black, or Other due to the small numbers of participants who reported other race/ethnicities. Highest parental educational attainment was categorized as high school graduate or General Education Development, some college, or greater than or equal to Bachelor’s degree based on the distribution of parental educational attainment. Relationship status was categorized as single/never married versus other. For ease of interpretation, these categorizations were chosen.

Classifying a Smoker Scale

This scale was developed using results from focus groups with young adults (Berg et al., 2010) and were theoretically based on schema theory (Bartlett, 1932). The items were created by the

research team and were screened for clarity and face validity by four experts in tobacco research. The scale consists of 10 items. Participants were instructed to, “on a scale of 1–7, indicate the extent to which you agree with the following statements” with anchors of 1 = *strongly disagree*, 4 = *neutral*, and 7 = *strongly agree*. The stem leading into each statement was “In order for me to consider someone a smoker . . .” Each item is listed in Table 2. The scale is scored by summing the Likert responses to each item resulting in a total score. The minimum possible score was 10 with a maximum score of 70. Higher scores indicated stricter criteria for defining a smoker. That is, a score of 70 suggests that only those who smoke most frequently, who have smoked for longer periods of time, who buy their own cigarettes, and so on are considered smokers. On the other hand, a score of 10 suggests that even infrequent smokers, with a more recent initiation of smoking, who may borrow the cigarettes they smoke, and so on may be considered smokers.

Smoking Behaviors

To assess smoking status, students were asked “In the past 30 days, on how many days did you smoke a cigarette (even a puff)?” This question has been used to assess tobacco use in the American College Health Association (ACHA) surveys, National College Health Risk Behavior Survey, and Youth Risk Behavior Survey, and their reliability and validity have been documented by previous research (ACHA, 2008; Centers for Disease Control and Prevention, 1997). Students who reported smoking on at least 1 day in the past 30 days were considered current smokers, and students who reported smoking on all 30 days of the past month were considered daily smokers versus nondaily smokers (i.e., those who smoked from 1 to 29 days of the past 30 days). This is consistent with how ACHA, Substance Abuse and Mental Health Association, and others have defined “daily smokers” (ACHA, 2009; Substance Abuse and Mental Health Services Administration, 2006). Nicotine dependence was assessed using a single question regarding time to first cigarette (i.e., within 30 min of waking vs. after) from the Fagerström Nicotine Dependence Scale (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991).

Quitting Smoking

Readiness to quit was assessed by asking “What best describes your intentions regarding quitting smoking: never expect to quit; may quit in the future, but not in the next 6 months; will quit in the next 6 months; and will quit in the next month” (Prochaska & DiClemente, 1984). For the present study, this variable was dichotomized as intending to quit in the next 30 days versus all other responses. Participants were also asked “During the past 12 months, how many times have you stopped smoking for one day or longer because you were trying to quit smoking?” (California Department of Health and Human Services. Tobacco Control Section, 1999). This variable was dichotomized as having made at least one quit attempt in the past year versus not having made an attempt to quit.

Identification of a Smoker

Participants were asked “Do you consider yourself a smoker?” (Berg et al., 2009).

Social Smoking

To assess social smoking, participants were also asked “In the past 30 days, did you smoke: mainly when you were with other

people; mainly when you were alone, as often by yourself as with others, or not at all” (Moran et al., 2004). This variable was dichotomized as “social smoking” (i.e., smoking mainly when with others) versus other responses.

Social Aspects of Smoking

Participants were asked “Did either of your parents smoke when you lived with them?” (Berg et al., 2011) and “Out of your five closest friends, how many of them smoke cigarettes?” (Mai-bach, Maxfield, Ladin, & Slater, 1996) to determine their social experiences with smoking. To assess perceived smoking prevalence, we asked “What percent of students at your school do you think have smoked at least one cigarette in the past 30 days? (State your best estimate.)” (Choi, Ahluwalia, Harris, & Okuyemi, 2002).

Perceived Harm

Participants were asked “Do you believe there is any harm in having an occasional cigarette?” with response options of “yes” or “no” (Minnesota Department of Health, 2008) and “At what point does smoking become harmful to one’s health? Smoking 1 day per week; smoking 3 days per week; smoking 1 cigarette per day; smoking 3 cigarettes per day; smoking 5 cigarettes per day; smoking 10 cigarettes per day; smoking 20 cigarettes per day.”

Smoking Attitudes

The Smoking Attitudes Scale (Shore et al., 2000) is a 17-item questionnaire assessing attitudes toward smoking. The Smoking Attitudes Scale asked participants to rate on a 7-point scale how strongly they agree (1 = *strongly disagree*, 7 = *strongly agree*) with 17 smoking-related statements across four dimensions—interpersonal relationships with smokers, laws and societal restrictions on smoking in public places, health concerns, and the marketing and sale of cigarettes (Shore et al., 2000). Sample questions include “second-hand smoke is a legitimate health risk” and “nonsmokers should be more tolerant of smokers.” Higher scores indicate more negative attitudes regarding smoking (i.e., more negative thoughts regarding relationships with smokers, more positive attitudes toward smoking restrictions, more negative attitudes regarding smoking-related health risks, and more negative attitudes regarding the marketing and sale of cigarettes). The scale produces significantly different scores for smokers and nonsmokers, with smokers possessing consistently more favorable attitudes toward smoking-related topics (Shore et al., 2000). The scale has good construct validity and subscale alphas ranging from .69 to .88 (Shore et al., 2000).

Data Analysis

Participant characteristics were summarized using descriptive statistics. In order to obtain internal consistency reliabilities for the Classifying a Smoker Scale, we calculated Cronbach’s alpha. Factor analyses were conducted to determine the underlying factor structure of the scale. Scale scores were examined in relation to sociodemographic and smoking-related characteristics using *t* tests for categorical variables and correlations for continuous variables. Binary logistic regression and ordinary least squares regression were used to examine scale scores as a predictor of smoking status and smoking-related characteristics as appropriate. To control for the potential influence of demographic characteristics on the primary outcomes of interest (smoking status, number of days of smoking, perceived harm, and considering

oneself a smoker), age, gender, and ethnicity were entered into each model, and then scale scores were entered to determine if it was a significant predictor. SPSS 18.0 was used for all data analyses. Statistical significance was set at $\alpha = .05$ for all tests.

Results

Construct Validity: Factor Analysis

Factor analysis using principal components extraction with varimax rotation was applied to the 10 items of the Classifying a Smoker Scale. Following conservative guidelines for factor analysis detailed by [Tabachnick and Fidell \(1989\)](#), after the matrix was rotated, factors were retained whose eigenvalues were greater than 1.0 and on which there were greater than three items, each of which had to have loadings greater than .50. Items included in the final scale, the factor loadings for each, and item means and standard deviations are presented in Table 1. Factor analysis of the items extracted a single factor that accounted for 40.00% of the variance in scores (eigenvalue = 5.52). We explored the possibility of a two-factor solution; however, the additional factor produced trivial factors that had item loadings that were not interpretable and content relevant. Thus, given that 40.00% of the variance was explained by the single factor, we concluded that this was the most parsimonious and theoretically coherent solution.

All items had strong factor loadings, with the exception of physical characteristics (i.e., “A person has to have certain personality characteristics, such as being more stressed or depressed than other people”), whose factor loading was slightly weaker than the others (.56 vs. $\geq .69$ among others). Nonetheless, all items were retained for use in this scale (Table 1). Scale scores range from 10 to 70, with higher scores indicating more strict

criteria for considering someone a smoker (i.e., less inclusive of various patterns of smoking and types of people), whereas lower scores suggested less strict criteria in their classification (i.e., more inclusive of various patterns of smoking and types of people). Also of note are the average item scores. Participants had a higher level of agreement, on average, with several factors in their classification of a smoker (e.g., “A person has to smoke habitually or as part of their daily routine” and “A person has to smoke almost every day”) and a lower level of agreement with other statements in their criteria of a smoker (e.g., “A person must have certain physical characteristics . . .” and “A person has to have certain personality characteristics . . .”). In summary, on the basis of these factor analyses and the item content, the Classifying a Smoker Scale appears to be a homogenous scale that taps its intended construct.

Reliability and Descriptive Statistics

The Classifying a Smoker Scale yielded a Cronbach's alpha of .91. We tested the reliability of the scale using split-half reliability analysis, which indicated Cronbach's alphas of .88 and .86, with a correlation between forms of .70. The Spearman-Brown split-half coefficient was .82. Average score on the Classifying a Smoker Scale was 39.38 ($SD = 16.58$).

Concurrent Validity: Smoking Status and Smoking-Related Characteristics

Table 2 presents participant sociodemographic characteristics and bivariate analyses examining differences in Classifying a Smoker Scale scores. In regard to smoking, 22.8% were current smokers (13.8% were nondaily and 9.0% were daily). Higher Classifying a Smoker Scale scores were related to being younger ($p < .001$) and not being White ($p < .001$), but not to smoking status. Table 3 presents the binary logistic model identifying factors related to current smoking status, which indicated that older age ($p < .001$), being male ($p < .001$), being White ($p < .001$), and higher Classifying a Smoker Scale scores ($p = .001$) were significant correlates of current smoking status.

Table 1. Factor and Items Retained for the Classifying a Smoker Scale

Item	Factor loading	<i>M</i> (<i>SD</i>)
A person has to smoke almost every day	.74	4.51 (2.32)
A person has to have smoked for quite a while, maybe over a year	.75	3.80 (2.34)
A person has to smoke even when they are alone	.81	4.52 (2.26)
A person must smoke when he/she is not drinking alcohol	.78	4.21 (2.28)
A person must buy cigarettes, rather than “bumming” them	.72	3.78 (2.28)
A person has to have certain personality characteristics, such as being more stressed or depressed than other people	.56	2.38 (1.84)
A person must have certain physical characteristics, such as smelling like cigarettes or having yellow teeth or fingers	.69	3.05 (2.20)
A person has to be addicted to nicotine	.78	4.07 (2.28)
A person must have a hard time quitting smoking when they try to quit	.77	4.23 (2.29)
A person has to smoke habitually or as part of their daily routine	.81	4.83 (2.22)
Total score	–	39.38 (16.58)

Table 2. Sociodemographic Characteristics and Bivariate Analyses Examining the Classifying a Smoker Scale, *N* = 3,863

Variable	<i>N</i> (%) or <i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>) or <i>r</i>	<i>p</i> Value
Age (<i>SD</i>)	21.55 (3.14)	–0.14	<.001
Gender (%)			.06
Male	1,092 (28.3)	38.59 (15.93)	
Female	2,771 (71.7)	39.69 (16.83)	
Ethnicity (%)			<.001
Non-Hispanic White	1,759 (45.5)	38.10 (16.03)	
Black	1,475 (38.2)	40.88 (17.08)	
Other	629 (16.3)	39.45 (16.66)	
Parental education (%)			.44
≤High school diploma/GED	903 (23.4)	39.99 (17.29)	
Some college	1,429 (37.0)	39.24 (16.67)	
≥Bachelors	1,531 (39.6)	39.15 (16.08)	
Smoking status (%)			.45
Nonsmoker	2,982 (77.2)	39.27 (17.22)	
Current smoker	881 (22.8)	39.75 (14.22)	

Table 3. Binary Logistic Regression Predicting Current Smoking Status

Variable	OR	95% CI	p Value
Age	1.09	1.04–1.10	<.001
Gender			
Male	Ref	–	–
Female	0.66	0.54–0.75	<.001
Ethnicity			
White	Ref	–	–
Black	0.20	0.17–0.26	<.001
Other	0.46	0.38–0.59	<.001
Classifying a Smoker Scale	1.01	1.01–1.02	.001

Note. OR = odds ratio.

Table 4 presents participant smoking-related characteristics in relation to Classifying a Smoker Scale scores. Higher scores were found to be related to being a nondaily versus a daily smoker ($p = .009$), and among smokers, fewer days of smoking in the past 30 days ($p = .002$) and being ready to quit in the next 30 days ($p = .04$). In terms of social factors, higher scores on the Classifying a Smoker Scale were related to not having parents that smoked ($p = .02$) and greater perceived proportion of college students who smoke ($p = .007$). In addition, higher Classifying a Smoker Scale scores were associated with not considering oneself to be a smoker ($p < .001$) and being a social smoker ($p < .001$) among current smokers. Higher scores on Classifying a Smoker Scale were associated with less perceived harm of smoking among current smokers and nonsmokers ($p < .001$, respectively) and a higher level of smoking perceived to be harmful ($p < .001$). Finally, higher scores on the Classifying a Smoker Scale were related to less favorable attitudes toward laws and restrictions around smoking ($p < .001$) but greater health concerns about smoking ($p = .01$).

Table 5 presents three multivariate models examining smoking-related characteristics among current smokers. In terms of factors associated with number of days smoked in the past 30 days, older age ($p < .001$), being White ($p < .001$), and lower Classifying a Smoker Scale scores ($p = .02$) were significant factors related to greater frequency of smoking. After controlling for age, ethnicity, and number of days smoked, lower Classifying a Smoker Scale scores were significantly associated with identifying oneself as a smoker ($p < .001$). After controlling for these sociodemographic characteristics and number of days smoked in the past 30 days, a lower score on the Classifying a Smoker Scale was associated with greater perceived harm of occasional smoking ($p < .001$).

Discussion

Prior research has examined sociodemographic and behavioral factors (e.g., being male, frequency of smoking, alcohol consumption; Berg et al., 2009; Levinson et al., 2007) associated with whether one identifies as a smoker and has qualitatively examined what criteria college students use to define the term “smoker.” This study is novel, as it extends this line of research, creating a tool that quantitatively assesses one’s schema regarding a smoker within the young adult population. This is critical,

as how one defines a smoker may have significant implications for uptake of smoking, smoking and quitting behavior, motivation to quit, barriers to cessation, and thus the development of cessation interventions (Berg et al., 2009, 2010; Levinson et al., 2007). This research provides a foundation for future research to explore these important issues.

The present study established the reliability and validity of the Classifying a Smoker Scale. First, we found a single factor underlying the items included in this scale, which seemed to capture the extent to which an individual must demonstrate a pattern of cigarette use and a reliance on smoking in order to be considered a smoker. Given that a schema is defined as a mental framework for organizing social information centered on a specific theme (Bartlett, 1932), this single-factor solution is reasonable. Moreover, the scale demonstrated acceptable internal consistency and split-half consistency. However, the items retained were not all equally important in the participants’ schemas of what a smoker is. For example, mean responses on items such as a person demonstrating a habit of smoking, smoking every day, or smoking alone indicated that students were more likely to agree that these statements needed to be true in order for them to consider someone a smoker. On the other hand, they agreed less often, on average, that the statements regarding physical characteristics (e.g., yellowing teeth, smell) or personality characteristics (e.g., being stressed out or anxious) needed to be true in order for them to consider someone a smoker. One explanation of this might be the age of the individuals, such that younger people may not be manifesting some of the physical or personality characteristics that those who have smoked longer or are older may show. Another explanation is that these characteristics are more subjective and less behaviorally related to the schema of what constitutes a smoker.

Second, we verified that young adults’ schemas regarding a smoker (per the Classifying a Smoker Scale) has important implications for smoking behavior, specifically whether or not one is a current smoker (after controlling for important sociodemographics) and, if one is a smoker, the frequency of smoking. Importantly, higher scale scores were associated with being a nondaily versus a daily smoker and fewer days of smoking in the past month among smokers. This is consistent with prior research indicating that low-level smokers are less likely to perceive themselves as smokers (Berg et al., 2009; Levinson et al., 2007). Perhaps, this reflects an individual’s inclination to reduce cognitive dissonance—that is, they maintain that they are not smokers despite smoking, by having a more restrictive definition of a smoker, which they themselves do not meet.

This explanation might also contextualize the findings regarding perceived harm and intention to quit smoking. If an individual smokes but does not consider him- or herself a smoker, they may not perceive their behavior as harmful and thus may not be inclined to quit—or even see quitting as relevant (Berg et al., 2009, 2010). Moreover, having more favorable attitudes toward smoking restrictions were related to having less restrictive criteria for defining a smoker. This might reflect an overall stronger negative reaction to smoking, even very infrequently.

The relationships of scale scores to social factors are difficult to explain. Higher Classifying a Smoker Scale scores

Table 4. Smoking-Related Characteristics and Bivariate Analyses Examining the Classifying a Smoker Scale

Variable	<i>N</i> (%) or <i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>) or <i>r</i>	<i>p</i> Value
Smoking variables			
Nondaily vs. daily smoking (%) ^a			.009
Nondaily	533 (60.5)	40.43 (14.30)	
Daily	348 (39.5)	38.03 (14.47)	
Number of days of smoking in past 30 days (<i>SD</i>) ^a	18.40 (12.30)	−0.10	.002
First cigarette within 30 min of waking (%) ^a			.08
No	664 (71.9)	39.88 (14.51)	
Yes	260 (28.1)	38.00 (15.25)	
Readiness to quit (%) ^a			.04
No	672 (72.7)	38.74 (14.33)	
Yes	252 (27.3)	40.99 (14.79)	
Any quit attempts in past 12 months (%) ^a			.39
No	54 (5.8)	41.00 (14.84)	
Yes	870 (94.2)	39.25 (14.46)	
Social aspects of smoking			
Parents smoked (%)			.02
No	2,402 (62.2)	39.87 (16.86)	
Yes	1,461 (37.8)	38.58 (16.09)	
Number of friends who smoke (<i>SD</i>)	1.46 (1.56)	−0.02	.27
Perceived % of college students who smoke (<i>SD</i>)	59.87 (31.14)	0.05	.007
Identification of a smoker			
Do you consider yourself a smoker (%) ^a			<.001
No	403 (38.3)	42.89 (14.35)	
Yes	648 (61.7)	37.23 (14.04)	
Social smoker (%) ^a			<.001
No	529 (57.3)	37.84 (14.40)	
Yes	395 (42.7)	41.38 (14.37)	
Perceived harm and attitudinal factors			
Perceive harm in occasional smoking (%)			<.001
No	932 (24.1)	41.69 (14.27)	
Yes	2,931 (75.9)	38.65 (17.19)	
Perceive harm in occasional smoking (%) ^a			<.001
No	432 (41.1)	41.94 (12.36)	
Yes	619 (58.9)	37.61 (15.45)	
Frequency of smoking that is harmful (<i>SD</i>)	1.51 (1.81)	0.23	<.001
Attitudes toward Smoking Scale scores (<i>SD</i>)			
Interpersonal	22.00 (8.02)	0.02	.24
Health concerns	17.84 (4.16)	0.04	.01
Laws and restrictions	35.83 (7.54)	−0.08	<.001
Tobacco marketing	12.57 (4.97)	0.02	.22

Note. ^aIndicates among current smokers.

were related to having nonsmoking parents, which may reflect less exposure to some of the factors involved in the scale (e.g., difficulty quitting, personality characteristics, etc.). Higher scores were also associated with greater perceived prevalence of smoking. This may be related to low-level or nondaily smokers perceiving prevalence of smoking to be greater but having more strict criteria about what a “real” smoker is. Perhaps, both these findings reflect protective mechanisms that help the smoker to avoid confronting their own smoking behavior. These relationships deserve further examination.

Implications for Research and Practice

This study highlights the importance of how assessments are conducted, particularly given concerns that traditional surveillance systems may underestimate smoking (Substance Abuse and Mental Health Services Administration, 2006; West, W., Przewozniak, & Jarvis, 2007). In research, this scale could be investigated to determine if young adults’ schemas of what constitutes a smoker may be related to smoking initiation, maintenance of a low level of smoking over time, and lack of intent to quit smoking (Berg et al., 2009). This might provide further validation of this scale, specifically predictive validity. Doing so

Table 5. Binary Logistic Regression Predicting Number of Days of Smoking, Considering Oneself a Smoker, and Perceived Harm of Occasional Smoking Among Current Smokers

Variable	Coefficient	95% CI	p Value
Number of days smoked in the past month			
Age	0.44	0.35 to 0.54	<.001
Gender	−0.49	−1.99 to 1.02	.53
Ethnicity	−2.20	−3.23 to −1.18	<.001
Classifying a Smoker Scale	−0.06	−0.11 to −0.01	.02
Variable	OR	95% CI	p Value
Consider self a smoker			
Age	1.07	1.02 to 1.11	.002
Gender			
Male	Ref	–	–
Female	0.89	0.55 to 1.44	.63
Ethnicity			
White	Ref	–	–
Black	2.85	1.71 to 5.74	.001
Other	0.78	0.40 to 1.53	.47
Number of days smoked, past 30 days	1.24	1.21 to 1.28	<.001
Classifying a Smoker Scale	0.95	0.94 to 0.97	<.001
Perceived harm of occasional smoking			
Age	1.04	1.02 to 1.06	<.001
Gender			
Male	Ref	–	–
Female	1.14	0.87 to 1.49	.33
Ethnicity			
White	Ref	–	–
Black	1.39	0.98 to 1.97	.07
Other	1.30	0.88 to 1.93	.19
Number of days smoked, past 30 days	0.99	0.99 to 1.01	.64
Classifying a Smoker Scale	0.98	0.97 to 0.99	<.001

Note. OR = odds ratio.

may highlight specific intervention strategies for prevention of smoking uptake and cessation. In practice, we must determine how to develop messages that are receptive to the young adult population and how to make interventions applicable to this group. Useful intervention messages might include the negative health consequences of smoking (particularly light or occasional smoking) and the negative stigma of smoking. In the clinical setting, identifying smokers and intervening for cessation, which is standard of care (Fiore, Jaen, & Baker, 2008), may be extended to identification of individuals, particularly youth, at risk for smoking initiation. Given that they may not perceive that health risks are personally relevant (Levinson et al., 2007), this is an important intervention opportunity.

Limitations

This study has some limitations. First, the survey sample was largely female and drawn from Southeast colleges. Despite the fact that this sample reflects the characteristics of these school populations and has good representation of White and Black ethnic backgrounds, it may not generalize to other college

populations. Second, the survey response rate was 20.1%, which may seem low and might suggest responder bias. However, previous online research has yielded similar response rates (29%–32%) among the general population (Kaplowitz, Hadlock, & Levine, 2004) and a wide range of response rates (17%–52%) among college students (Crawford, McCabe, & Kurotsuchi Inkelas, 2008). We are also unable to ascertain how many participants did not open the E-mail or had inactive E-mail accounts, which impacts what the true “denominator” for this response rate may have been. In addition, prior work has demonstrated that, despite lower response rates, internet surveys yield similar statistics regarding health behaviors compared with mail and phone surveys (An et al., 2007). Also, we did not include additional items beyond the 10 items reported here. Thus, it is possible that other dimensions exist, but were not explored in this study. Perhaps, more items were needed to yield multiple factors. Future research might explore other dimensions of how young adults conceptualize the schema of a smoker, both qualitatively and quantitatively. In addition, there may be issues of differential item functioning such that the scale might operate differently across sub-groups (e.g., race, gender). Thus, there might be bias or interaction “within the scale.” This should be examined in future research. Another limitation is that while a large sample size is desirable for adequate power to detect differences, some of the statistically significant differences in our analyses may be reflect subtle ones whose application may be unclear. In particular, our small odds ratios of the Classifying a Smoker Scale in relation to current smoking status warrants further examination to determine the clinical significance of this finding. Finally, the cross-sectional nature of this study limits the extent to which we can make causal attributions. Future research should examine the predictive validity of this finding in longitudinal studies examining smoking initiation and potentially smoking cessation.

Conclusions

The present findings indicate a broad range of criteria used to establish what constitutes being a smoker and how this definition interplays with smoking-related characteristics. This measure is an important development in being able to adequately assess how college students conceptualize the schema of a smoker. In so doing, we will improve our ability to identify the motivators, barriers, and other psychosocial sequelae that must be addressed in interventions or campaigns targeting cessation. Furthermore, future research should examine perceived health threats of occasional smoking and attitudes about cessation among those who do not consider themselves to be smokers. This could inform the development of messages and interventions targeting cessation among college students. Finally, the variability in how being a smoker is defined may highlight an opportunity for identifying individuals at risk for smoking uptake, continued smoking, or lacking intent or motivation to quit smoking.

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Declaration of Interests

None declared.

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