ORIGINAL INVESTIGATION

Classifying a Smoker Scale in Adult Daily and Nondaily Smokers

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ABSTRACT

Introduction: Smoker identity, or the strength of beliefs about oneself as a smoker, is a robust marker of smoking behavior. However, many nondaily smokers do not identify as smokers, underestimating their risk for tobacco-related disease and resulting in missed intervention opportunities. Assessing underlying beliefs about characteristics used to classify smokers may help explain the discrepancy between smoking behavior and smoker identity. This study examines the factor structure, reliability, and validity of the Classifying a Smoker scale among a racially diverse sample of adult smokers.

Methods: A cross-sectional survey was administered through an online panel survey service to 2,376 current smokers who were at least 25 years of age. The sample was stratified to obtain equal numbers of 3 racial/ethnic groups (African American, Latino, and White) across smoking level (nondaily and daily smoking).

Results: The Classifying a Smoker scale displayed a single factor structure and excellent internal consistency ($\alpha = .91$). Classifying a Smoker scores significantly increased at each level of smoking, $F(3,2375) = 23.68, p < .0001$. Those with higher scores had a stronger smoker identity, stronger dependence on cigarettes, greater health risk perceptions, more smoking friends, and were more likely to carry cigarettes. Classifying a Smoker scores explained unique variance in smoking variables above and beyond that explained by smoker identity.

Conclusions: The present study supports the use of the Classifying a Smoker scale among diverse, experienced smokers. Stronger endorsement of characteristics used to classify a smoker (i.e., stricter criteria) was positively associated with heavier smoking and related characteristics. Prospective studies are needed to inform prevention and treatment efforts.

INTRODUCTION

Smoker identity, or the strength of beliefs about oneself as a smoker, is a robust marker of smoking behavior (e.g., Harris, Schwartz, & Thompson, 2008; Hertel & Mermelstein, 2012; Tracy, Lombardo, & Bentley, 2012). Those with a stronger smoker identity are heavier smokers (e.g., Falomir & Invernizzi, 1999; Shadel, Mermelstein, & Borrelli, 1996), smoke on more days (Choi, Choi, & Rifon, 2010; Shiffman et al., 2012), have a longer smoking history (Vangeli, Stapleton, & West, 2010), and are more nicotine dependent (e.g., Hertel & Mermelstein, 2012; Tracy et al., 2012). Converted nondaily smokers, who are former daily smokers, endorse a stronger smoker identity than those who were always nondaily smokers (native; Shiffman et al., 2012). Furthermore, stronger identification as a smoker is prospectively linked with smoking escalation among

adolescents (Hertel & Mermelstein, 2012). This prospective finding establishes the importance of smoker identity as a precipitating factor in the progression of smoking behavior.

While heavier smokers have stronger smoker identities, many nondaily smokers do not identify themselves as smokers (Berg et al., 2009; Levinson et al., 2007; Ridner, Walker, Hart, & Myers, 2010; Thompson et al., 2007; Waters, Harris, Hall, Nazir, & Waigandt, 2006). When individuals who consume cigarettes fail to identify as smokers, smoking cessation messages may not be perceived as personally relevant and may result in missed opportunities to reach these smokers. This may have serious public health consequences as nondaily smokers, as do daily smokers, experience increased risk of tobacco-related morbidity and mortality (Luoto, Uutela, & Puska, 2000; Pope et al., 2009; Schane, Ling, & Glantz, 2010; U.S. Department of Health and Human Services, 2010). This is especially salient given that

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Classifying a Smoker scale

nondaily smokers represent a rapidly growing smoking population in the United States (Centers for Disease Control, 2012).

To bridge the discrepancy between smoking behavior and self-identification as a smoker, it is important to better understand how and why individuals identify as a smoker. Methods for assessing smoking identity include single item questions, such as “Do you consider yourself a smoker?” (e.g., Berg et al., 2009; Maggi, Linn, & Marion, 2005; Okoli, Torchalla, Ratner, & Johnson, 2011; Ridner et al., 2010; Thompson et al., 2007) as well as multi-item questionnaires (e.g., Moan & Rise, 2006; Shadel & Mermelstein, 1996; van den Putte, Yzer, Willemsen, & de Bruijn, 2009). While valid, neither approach provides insight into internalized beliefs about what makes someone a smoker. Recently, a brief instrument for assessing the concept of being a smoker was developed in a population of college students (Berg et al., 2011). The Classifying a Smoker scale assesses underlying beliefs about characteristics that define smokers. Specifically, participants rate their agreement with statements describing behaviors (e.g., smoking frequency) or characteristics (e.g., nicotine addiction) that would classify a smoker. In Berg et al.’s (2011) study, higher smoker classification scores (i.e., more strict criteria for defining a smoker) were associated with lower smoker identity and lower smoking levels. Berg et al. theorized that stricter criteria for classifying a smoker may serve as a way for those who do not smoke frequently to rationalize their self-identification as non-smokers.

The Classifying a Smoker Scale displays strong psychometric properties among college students and shows promise for investigating how the concept of being a smoker is linked with a variety of important smoking behaviors (Berg et al., 2011). However, no other studies have examined this measure with other populations. Before utilizing this instrument with more diverse populations, research is needed to determine whether the underlying factor structure, reliability, and validity of the instrument is acceptable among a more experienced and racially diverse, non-college student population; which are the aims of the present study. Based on Berg et al.’s findings we hypothesized that Classifying a Smoker scores will (a) decrease by smoking level (nondaily, light daily, heavy daily); and be associated with the following: (b) smoker identity, (c) dependence on cigarettes, (d) cessation cognitions and behaviors (e.g., intention to quit, and number of previous quit attempts), (e) social aspects of smoking, and (f) behavioral aspects of smoking. Furthermore, we expect to differentiate classifying a smoker from smoker identity, by demonstrating that classifying a smoker explains unique variance in dependence, cognitive, social, and behavioral variables.

METHODS

Participants

Participants completed a cross-sectional survey administered through an online panel survey service, Survey Sampling International (SSI), between July 5, 2012 and August 15, 2012. SSI maintains access to an online panel of 1.5 million people in the United States, referred to as panelists, who have indicated that they are willing to participate in online surveys. Potential panelists are recruited through a variety of methods including websites, social media, and online communities. Participants eligible for this study self-identified as African American,

White, or Latino (of any race), were at least 25 years old, and were English-speaking. These participants were current smokers (i.e., smoked at least one cigarette in the past 30 days), had smoked at least 100 cigarettes in their lifetime, smoked for at least 1 year, smoked at their current rate (i.e., daily or nondaily) for at least 6 months, and had not participated in any smoking cessation treatment in the past 30 days. Women who were currently pregnant or breast-feeding were excluded from the study.

The sample was stratified to obtain equal samples of each of the three-race/ethnicity groups across smoking level (nondaily and daily smoking). Nondaily smokers smoked at least one cigarette on 4–24 days in the past 30 days; persons who smoked on fewer than four days in the past 30 days were ineligible (Shiffman et al., 2012). Daily smokers smoked 25–30 days in the past 30 days (Evans et al., 1992) and were further stratified into light daily smokers (≤ 10 cigarettes per day; CPD) and moderate to heavy daily smokers (> 10 CPD). Quotas by smoking level were 1,200 for nondaily smokers, 600 for light daily smokers, and 600 for moderate to heavy daily smokers.

Overall, 42,715 participants began the screener for this study, 13,775 did not meet the study criteria and were ineligible, 21,891 were ineligible because of full quotas (i.e., race/ethnicity, smoking level), and 4,581 discontinued before completing the survey (90% prior to starting the survey). The survey company completed a quality check that ensured no duplicate responses. The final study sample consisted of 2,376 participants.

Procedures

All procedures were approved by the University of Minnesota Institutional Review Board. SSI used preliminary questions (e.g., smoking frequency) and existing participant information (e.g., race/ethnicity, age) to direct smokers to this study. Potential participants directed to the study were presented with the informed consent page. Once they provided consent, they were asked screening questions to determine eligibility. Eligible participants were then presented with the survey questions. Participants who completed the survey received SSI’s standard incentives, which included entry into a quarterly drawing and points that could be redeemed for cash.

Measures

Demographics

Demographic questions assessed participants’ age, gender, race/ethnicity, highest level of education, monthly household income (dichotomized to $< \$1,800$ and $\geq \$1,800$), and employment status.

Cigarette Use

Participants reported the number of days they smoked in the past month and average number of cigarettes smoked per day (CPD) on the days smoked in the past 7 days. Participants were asked to indicate the length of time they had been smoking cigarettes and whether they had ever smoked daily for at least 6 months. Nondaily smokers who indicated that they had smoked daily for at least 6 months were categorized as converted nondaily smokers and those who had never smoked daily for a six month period were categorized as native nondaily smokers (Shiffman et al., 2012). Current daily smokers were also asked the length of time as a daily smoker and current nondaily smokers were asked the length of time as a nondaily smoker.

Identity as a Smoker

Identity as a smoker was assessed using two items: “I consider myself a smoker” and “If someone casually asked if I was a smoker, I would say yes” (Shiffman et al., 2012). Response options for these items ranged from 1 “strongly disagree” to 10 “strongly agree.”

Classifying a Smoker

The Classifying a Smoker scale (Berg et al., 2011) was used to assess criteria for classifying a smoker. The scale consists of ten items rated on 7-point Likert scale with anchors of 1 “strongly disagree” to 7 “strongly agree” (see Table 1). Items are summed to create a total score, with higher values indicating stricter criteria for classifying a smoker.

Nicotine Dependence

Nicotine dependence was assessed by the Brief Wisconsin Inventory of Smoking Dependence Motives (WISDM; Smith et al., 2010), which is a 37-item measure consisting of 11 subscales (Smith et al., 2010). The subscales can be used to calculate an overall smoking dependence score, primary dependence motives, and secondary dependence motives scales. The Primary Dependence Motives scale is derived from the mean of four subscales that assesses smoking that requires little conscious control and is marked by strong cravings. The Secondary Dependence Motives scale is derived from the mean of the other seven subscales and assesses instrument and contextual effects of smoking (e.g., weight control, social/environmental goals).

In addition, two single-items were used. Time to first cigarette (dichotomized as: smoking ≤ 30 min after waking, and smoking > 30 min), as smoking within 30 min of waking denotes nicotine dependence (Baker et al., 2007; Heatherington, Kozlowski, Frecker, & Fagerstrom, 1991). Derived from the Cigarette Dependence Scale, participants were asked to report their level of perceived addiction to cigarettes on a scale of 0 “I am not addicted to cigarettes at all” to 100 “I am extremely addicted to cigarettes” (Etter, Le Houezec, & Perneger, 2003).

Health Risk Perceptions

Perceptions of health risks from smoking were assessed with the following items, “If you continue to smoke, how likely do you think it is that you will develop...”: (a) “lung cancer,” (b) “other lung diseases,” and (c) “heart disease” (Borrelli, Hayes,

Dunsiger, & Fava, 2010). Response options ranged from 1 “no chance” to 7 “certain to happen.”

Readiness to Quit and Past Quit Attempts

Intention to quit was assessed using a single-item “What describes your intention to stop smoking completely, not even a puff? Would you say you...”: “Never expect to quit,” “may quit in the future, but not in the next 6 months,” “will quit in the next 6 months,” “will quit in the next 30 days” (Fava, Velicer, & Prochaska, 1995). Participants reported number of quit attempts in the past year that lasted at least 24 hr, and longest attempt in the past year.

Social Smoking and Number of Smoking Friends

Social smoking was assessed by asking “In the past 30 days, did you smoke...”: “mainly when you were with others,” “mainly when you were alone,” and “as often by yourself as with others” (Moran, Weschler, & Rigotti, 2004). Participants were also asked to indicate the number of smokers out of their five closest friends (Centers for Disease Control and Prevention, 2006).

Access to Cigarettes

Participants were asked whether they usually carry cigarettes (yes/no) and how often they buy versus borrow cigarettes from others (adapted from the California Tobacco Survey; California Department of Public Health, 2008).

Data Analysis

Participant characteristics were summarized using descriptive statistics. Factor analysis using principal components with varimax rotation was applied to the 10 items of the Classifying a Smoker Scale. Internal reliability of the scale was assessed by performing Cronbach’s alpha and split half using an odd/even split.

For tests of validity, the hypothesis that classifying a smoker would vary by smoker type was tested using one-way ANOVA with smoker type (native nondaily, converted nondaily, light daily, and heavy daily) as the independent variable and classifying a smoker as the dependent variable, using Tukey’s HSD for post-hoc comparisons. Bivariate correlations were calculated for Classifying a Smoker scores with the following variables: (a) smoker identity, (b) smoking dependence (time to first cigarette, WISDM Total, and self-rated addiction), (c)

Table 1. Factor Analysis of the Classifying a Smoker Scale

Item loading	Mean (SD)	Factor
“In order for me to consider someone a smoker ...”		
A person has to smoke almost every day.	4.72 (2.06)	0.74
A person has to have smoked for quite a while, maybe over a year.	4.49 (2.03)	0.77
A person has to smoke even when they are alone.	4.82 (1.95)	0.81
A person must smoke when he/she is not drinking alcohol.	4.79 (1.97)	0.80
A person must buy cigarettes, rather than “bumming” them.	4.89 (2.00)	0.69
A person has to have certain personality characteristics, such as being more stressed or depressed than other people.	3.58 (2.05)	0.62
A person must have certain physical characteristics, such as smelling like cigarettes or having yellow teeth or fingers.	3.71 (2.13)	0.66
A person has to be addicted to nicotine.	4.71 (1.97)	0.77
A person must have a hard time quitting smoking when they try to quit.	4.82 (1.95)	0.79
A person has to smoke habitually or as part of their daily routine.	5.12 (1.89)	0.81

Classifying a Smoker scale

cessation cognitions and behaviors (health risk perceptions, intention to quit, and number of past year quit attempts), (d) social aspects of smoking (smoking with others and number of smoking friends), and (e) behavioral aspects of smoking (carrying cigarettes and buying vs. borrowing cigarettes).

Incremental validity of the Classifying a Smoker scale was tested using hierarchical regression analyses, entering demographic variables gender, age, and ethnicity on Step 1, smoker type (nondaily, daily light, daily heavy) on Step 2, smoker identity on Step 3, and classifying a smoker on Step 4 to predict outcome variables.

We assessed whether gender, ethnicity, race, years of smoking, and smoker type moderated the association between smoker identity and classifying a smoker. For each studied potential effect moderator, interaction analysis was conducted by fitting a linear regression model with smoker identity as the dependent variable and Classifying a Smoker scale, the studied variable, and their interaction as covariates. A significant interaction would indicate the existence of a moderating effect, in which case we would conduct stratified analysis by calculating Pearson correlation (r) between smoker identity and Classifying a Smoker scale for each subgroup. Partial correlation coefficients adjusting for gender, ethnicity, and age could also be calculated (however, if ethnicity is the studied factor, only gender and age adjusted; and vice versa).

RESULTS

Sample Characteristics

Slightly more than half of the sample were female (58.2%) with an average age of 42.97 ($SD = 12.44$). Very few (3.4%) had less than a high school education and 35.4% reported a household monthly income of less than \$1,800 (see [Supplemental Table 1](#)). On average, they smoked for 19.41 ($SD = 16.0$) years, smoked 9.71 ($SD = 8.62$) cigarettes per day, and smoked 21.99 ($SD = 8.68$) days per month. Approximately half (56.8%)

smoked within 30 min of waking. The majority (87.5%) reported ever smoking daily for 6 months or more.

Factor Structure

Principal components factor analysis of the 10 items of the Classifying a Smoker scale revealed that the first component accounted for 55.8% of the variance. By following analytic guidelines (Tabachnick & Fidell, 1989) and the interpretability in Berg et al.'s (2011) work, we extracted one factor. As indicated in [Table 1](#), all items had strong loadings (all ≥ 0.62), supporting the homogeneity of the scale. In addition, values of Kaiser's measure of sampling adequacy (KSA) for every item were all greater than .80 and the overall KSA was .90, indicating that the data are appropriate for the one-factor model.

Reliability

Cronbach's alpha for the Classifying a Smoker scale was .91. Split half reliability was evaluated using an odd-even split of items, which indicated Cronbach's alphas of .81 and .83 within each half of the test, a correlation of .91 between halves, and a final Spearman-Brown split-half coefficient of .95.

Criterion Validity

Classifying a Smoker score varied by smoking level (native nondaily, converted nondaily, light daily, heavy daily), providing evidence of criterion validity. Higher Classifying a Smoker scores significantly increased at each smoking level, $F(3,2375) = 23.68$, $p < .0001$, all significantly different $p < .05$ using Tukey HSD for post-hoc comparisons. Those with higher Classifying a Smoker scores had stronger smoker identity; greater smoking dependence; stronger health risk perceptions, lower intention to quit, fewer previous quit attempts; and were more likely to carry and buy versus borrow cigarettes (see [Table 2](#)). In terms of social characteristics, higher Classifying a Smoker scores was related to having more close friends who

Table 2. Association of the Classifying a Smoker Scale With Smoking Characteristics

Variable	<i>N</i> (%) or <i>M</i> (<i>SD</i>)	<i>r</i>
Classifying a smoker	45.66 (14.87)	—
Shiffman identity as a smoker ^a	15.54 (5.03)	.23**
Dependence motives total	3.93 (1.53)	.45**
Primary dependence motives	3.94 (1.78)	.41**
Secondary dependence motives	3.92 (1.49)	.44**
Time to first cigarette ≤ 30 min	1,349 (56.8%)	-.25*
Addiction rating	57.43 (32.96)	.24**
Perception of developing lung cancer	4.48 (1.33)	.15**
Perception of developing other lung disease	4.57 (1.37)	.15**
Perception of developing heart disease	4.55 (1.36)	.16**
Intention to quit ^b	2.31 (0.77)	-.07**
Number of quit attempts in past year	5.69 (10.60)	-.08**
No. of close friends who smoke	3.52 (1.49)	.09**
Mainly smoke with others	588 (24.7%)	.03
Usually carry cigarettes	1,756 (73.9%)	.17**
Buy own cigarettes ^c	2,111 (88.8%)	.10**

Note. ^aSum of: I consider myself a smoker ($M = 7.74$, $SD = 2.62$) and If someone casually asked if I was a smoker, I would say yes ($M = 7.80$, $SD = 2.68$), $\alpha = .89$.

^b0, never expect to quit to 3, will quit in the next 30 days.

^cCombined "buy all own cigarettes," "buy most own cigarettes," and "buy as many own cigarettes as borrow."

** $p < .001$.

smoke. However, smoking alone vs. with others was unrelated to classifying a smoker.

Hierarchical regression models were used to determine the unique contribution of classifying a smoker and the related construct, smoker identity, to the aforementioned smoking variables. Smoker identity was a stronger predictor than classifying a smoker in all of the models (see Tables 3, 4, and 5). However, classifying a smoker explained unique variance in smoking outcome variables above and beyond that explained by smoker identity (see Tables 3, 4, and 5). Notably, multivariate models did not predict intention to quit or number of quit attempts in the previous year.

Diverging from Berg et al.'s (2011) findings, higher Classifying a Smoker score was associated with greater smoking identity. Therefore we conducted interaction/stratified analyses to identify moderators of this relationship. Age was not a significant effect moderator, but age was positively associated with the smoker identity score ($p < .0001$)—older age was significantly associated with higher smoker identity. Gender, ethnicity, duration of smoking, and smoker type were found to significantly moderate the relationship between classifying a smoker and smoker identity. Specifically, males showed a significantly stronger association between smoker identity and classifying a smoker ($r = .30, p < .0001$) than females ($r = .20, p < .0001$; interaction effect $p = .02$). By ethnicity, the strongest association was observed among African Americans ($r = .31, p < .0001$), followed by Latinos ($r = .25, p < .0001$), then

Whites ($r = .13, p < .001$; interaction effect $p < .01$). Short-time smokers (<10 years) showed a significantly stronger association between smoker identity and classifying a smoker ($r = .39, p < .0001$) than long-time smokers (≥ 10 years; $r = .19, p < .0001$; interaction effect $p < .0001$). The regression model with the continuous years of smoking gave a consistent result as that with the dichotomized variable—the longer one smoked, the weaker the association between smoker identity and Classifying a Smoker scale.

By smoker type, the association between smoker identity and classifying a smoker was strongest among nondaily smokers ($r = .21, p < .0001$), followed by daily light ($r = .19, p < .0001$); and was non-significant among daily heavy ($r = .06, p = .12$; interaction effect $p < .001$). When we further distinguished between native and converted nondaily smokers in a four category model, converted nondaily ($r = .23, p < .0001$) and daily light smokers ($r = .19, p < .0001$) had a stronger association between smoker identity and Classifying a Smoker scale than native nondaily smokers ($r = .07, p = .21$) or heavy daily smokers ($r = .06, p = .12$).

Partial Pearson correlations adjusted for age, ethnicity, and gender were consistent with Pearson correlations without adjustment and hence were not shown. A multivariate regression model was conducted for smoker identity with the main effect and interaction effect of ethnicity (African American, Latino, and White), gender (male and female), smoking duration (<10 and ≥ 10 years), and smoker type (native nondaily,

Table 3. Incremental Validity of the Classifying a Smoker Scale

Predictor	Dependence outcome variables ($N = 2,376$)					
	WISDM Total		WISDM PDM ^a		WISDM SDM ^b	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.02***		.01***		.03***	
Control variables ^c						
Step 2	.18***		.24***		.12***	
Smoker type ^d		.43***		.50***		.35***
Step 3	.17***		.17***		.15***	
Smoker identity ^e		.48***		.48***		.44***
Step 4	.10***		.07***		.10***	
Classifying a smoker		.32***		.26***		.33***
Total R^2	.46***		.49***		.40***	
Predictor	Time to first cigarette		Addiction rating (0–100)			
	ΔR^2	β	ΔR^2	β		
Step 1	.02***		.004*			
Control variables ^c						
Step 2	.21***		.29***			
Smoker type ^d		-.46***		.55***		
Step 3	.08***		.16***			
Smoker identity ^e		-.33***		.46***		
Step 4	.02***		.01***			
Classifying a smoker		-.13***		.09***		
Total R^2	.32***		.47***			

Note. ^aPrimary Dependence Motives.

^bSecondary Dependence Motives.

^cControl variables included age, gender, and ethnicity.

^dSmoker type included nondaily, daily light, and daily heavy.

^eSum of Shiffman identity questions.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

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Table 4. Incremental Validity of the Classifying a Smoker Scale

Predictor	Cognitive, perceptual, and social variables (<i>N</i> = 2,376)					
	Risk Percep1 ^a		Risk Percep2 ^b		Risk Percep3 ^c	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1 Control variables ^d	.003*		.00		.00	
Step 2 Smoker type ^e	.02***	.13***	.02***	.13***	.01***	.11***
Step 3 Smoker identity ^f	.03***	.21***	.04***	.23***	.03***	.19***
Step 4 Classifying a smoker	.01***	.10***	.01***	.10***	.01***	.12***
Total <i>R</i> ²	.06***		.06***		.06***	

Predictor	Intention to quit		No. of quit attempts past year		No. of smoking close friends	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1 Control variables ^d	.02**		.004		.01***	
Step 2 Smoker type ^e	.02**	-.12**	.03**	-.17***	.02***	.13***
Step 3 Smoker identity ^f	.02**	-.14**	.02**	-.10**	.01***	.10***
Step 4 Classifying a smoker	.002	-.04	.00	-.02	.002*	.05*
Total <i>R</i> ²	.05		.05		.19***	

Note. ^aIf continue smoking, risk of developing lung cancer.

^bIf continue smoking, risk of developing other lung disease.

^cIf continue smoking, risk of developing heart disease.

^dControl variables included age, gender, and ethnicity.

^eSmoker type included nondaily, daily light, and daily heavy.

^fSum of Shiffman identity questions.

p* < .05. *p* < .01. ****p* < .0001.

Table 5. Incremental Validity of the Classifying a Smoker Scale

Predictor	Social and behavioral variables (<i>N</i> = 2,376)					
	Smoke alone ^a		Carry cigarettes ^b		Buy cigarettes ^c	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1 Control variables ^d	.08***		.004*		.01***	
Step 2 Smoker type ^e	.03***	-.16***	.15***	.21***	.05***	.07**
Step 3 Smoker identity ^f	.01**	-.11***	.11***	.37***	.07***	.31***
Step 4 Classifying a smoker	.01**	.07**	.002*	.04*	.00	.01
Total <i>R</i> ²	.13**		.27*		.13	

Note. ^aSmoke mainly alone (*N* = 867) was reference group compared to mainly smoke with others (*N* = 588); those who smoked equally alone and with others (*N* = 921) were excluded from analysis.

^bUsually carry cigarettes (no) was reference group compared to yes.

^cCombined “borrow all” and “borrow most” cigarettes to form reference group compared to combined group “buy all own cigarettes,” “buy most own cigarettes,” and “buy as many own cigarettes as borrow” for buy cigarettes.

^dControl variables included age, gender, and ethnicity.

^eSmoker type included nondaily, daily light, and daily heavy.

^fSum of Shiffman identity questions.

p* < .05. *p* < .01. ****p* < .0001.

converted nondaily, daily light, and daily heavy smokers), and the main effect of age without interaction. The interactions were all significant and the directions of the slope differences across different subgroups were consistent with the separate interaction analyses. The main effect of age was still significant even after adjusting all the other main and interaction effects.

DISCUSSION

In this study, the Classifying a Smoker scale displayed a single factor structure and demonstrated strong internal consistency in a racially diverse sample of experienced smokers, consistent with findings from a previous study with college students (Berg et al., 2011). Interestingly, the direction of many relationships was opposite as that found with a college sample in the work by Berg et al. (2011). Among college students, those with higher Classifying a Smoker scores (i.e., more restrictive criteria for what it means to be a smoker, such as smokes every day, buys cigarettes, etc.) had weaker smoker identities (Berg et al., 2011). However, in the present study sample of more diverse, experienced smokers, the association between smoker identity and classifying a smoker was positive—those with higher Classifying a Smoker scores had stronger smoker identities.

Consistent with having stronger smoker identities, those with higher Classifying a Smoker scores also had higher nicotine dependence on multiple measures. Furthermore, those with higher Classifying a Smoker scores had higher perceived health risks from smoking, more close friends who smoke, and were more likely to carry cigarettes. In correlational analysis, higher Classifying a Smoker scores was associated with buying as opposed to borrowing cigarettes, less intention to quit smoking, and fewer quit attempts in the past year. Finally, in multivariable analysis, higher Classifying a Smoker score was associated with smoking with others, as opposed to smoking alone.

In terms of distinguishing classifying a smoker from smoker identity, smoker identity was a stronger predictor overall of a variety of smoking and behavioral outcomes. However, classifying a smoker improved the prediction models for these same outcomes beyond smoker identity, demonstrating that classifying a smoker is a unique and useful construct. The differential association between classifying a smoker and smoker identity and related characteristics observed in the Berg et al. (2011) study and the present study leads to further questions about how these variables operate. Exploratory analysis demonstrated that the relationship between classifying a smoker and smoker identity varies based on population characteristics, including gender, ethnicity, smoker type, and years of experience as a smoker, but not age. These population differences may account for the differences in the direction of the association between classifying a smoker and smoker identity and related characteristics observed in the Berg et al. study and the present study. Stronger smoker identity has been linked with longer smoking history in previous work (Vangeli et al., 2010). Smoker identity in the present study sample is in fact higher than that in Berg et al.'s study. Using a median split for identity as a smoker scores, 14.1% of the present study sample had low smoker identity compared to 38.3% in the Berg et al. who did not identify as a smoker.

Perhaps with more years of smoking, the need to use strict criteria in classifying a smoker decreases because there is more

acceptance of being a smoker. Therefore, classifying a smoker and smoker identity become more independent (less correlated) among more experienced smokers. This idea is supported by our finding that number of years smoking moderated the association between classifying a smoker and smoker identity in the present study. Specifically, the longer one smoked, the weaker the association between classifying a smoker and smoker identity. Replication studies with samples of smokers with various years of experience would be valuable to confirm the direction of associations between classifying a smoker and smoker identity and related characteristics seen in the two studies to date. Based on the present available data, higher Classifying a Smoker scores among mature, diverse smokers are associated with higher smoking frequency, stronger dependence, etc., which is opposite to that observed among college students.

Building from the idea that as years of smoking experience accumulate and acceptance of smoking/smoker identity grows, another explanation for the discrepant results derives from social identity theory (Hogg, 2006). College smokers, who tend to have lower smoker identities, may classify smokers stringently to distance themselves from “out-group” members unlike themselves. In contrast, experienced smokers with greater acceptance of smoker identity may classify smokers stringently to set a high bar for who belongs to their “in-group.” For experienced smokers, if their stricter view of who constitutes a smoker is driven by the “in-group” phenomenon, this could have important implications for smoking cessation. Specifically, “in-group” membership could convey active smoking rather than quitting as the norm and thereby thwart quit attempts. If this is the case, future research aimed at identifying moderators of the relationship between classifying a smoker and quitting behavior among established smokers would be informative.

A chief limitation of this study was the use of a cross-sectional design that does not allow a temporal relationship to be established between classifying a smoker and smoker identity. In addition, even though recruitment from an online panel provided a sample drawn from geographic regions throughout the United States, this limited participation to individuals who had access to the internet and were willing to complete online surveys. Additionally, although our sample is racially and ethnically diverse, it is not representative of the U.S. population and future research should include other racial groups.

Given the cross-sectional nature of the present study, prospective studies are needed to determine how to target classifying a smoker in interventions. Three possible implications for intervention are offered speculatively given the limitations inherent in the cross-sectional design. First, present data suggest that higher Classifying a Smoker score is indicative of a variety of risk factors, and it is possible that cognitive approaches to directly modify Classifying a Smoker would be useful. In practice, decreasing Classifying a Smoker score would involve broadening cognitions about what makes someone a smoker. For example, lower Classifying a Smoker scores would reflect the belief that individuals do not have to smoke daily, carry cigarettes, etc. to classify as smokers. Second, targeting smoker identity directly, such as increasing negative perceptions of smoking and building an identity as a non-smoker may weaken smoker identity (Falomir & Invernizzi, 1999; Freeman, Hennessy, & Marzullo, 2001; Hertel & Mermelstein, 2012) and decrease in-group bias (Hogg, 2006), and produce a

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corresponding change in classifying a smoker (i.e., broaden the parameters of classifying a smoker) and related risk behaviors.

Third, it is possible that smoking characteristics, such as cigarette dependence and number of smoking friends, are the variables that drive classifying a smoker. For example, those who are more dependent on cigarettes and have more smoking friends may be more likely to classify smokers more stringently. However, stronger identification as a smoker has been prospectively linked with smoking escalation among adolescents (Hertel & Mermelstein, 2012), suggesting that smoker identity and/or classifying a smoker would be appropriate targets of intervention for decreasing smoking behavior and related characteristics.

Prospective studies are needed to understand at what point in time the association between smoker identity and classifying a smoker, and their correlation with smoking characteristics, shifts from negative (i.e., college students) to positive (experienced smokers). Furthermore, disentangling the temporal relationship between classifying a smoker and smoker identity is essential to informing prevention and treatment efforts. The present study supports the use of the Classifying a Smoker scale in such work.

SUPPLEMENTARY MATERIAL

Supplementary Table 1 can be found online at <http://www.ntr.oxfordjournals.org>.

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DECLARATION OF INTERESTS

None declared.

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