



Published in final edited form as:

*Addict Behav.* 2010 February ; 35(2): 175–178. doi:10.1016/j.addbeh.2009.09.016.

## Correlates of Smoking Cessation Self-efficacy in a Community Sample of Smokers<sup>1</sup>

Elisa Martinez, MPH<sup>2,\*</sup>, Kristina L. Tatum, M.S.<sup>\*\*</sup>, Marcella Glass, MPH<sup>\*\*</sup>, Albert Bernath, MD<sup>\*\*\*</sup>, Daron Ferris, MD<sup>\*\*\*\*</sup>, Patrick Reynolds, MD<sup>\*\*\*\*\*</sup>, and Robert A. Schnoll, Ph.D.<sup>2,\*</sup>

\* Department of Psychiatry, University of Pennsylvania, 3535 Market Street, 4<sup>th</sup> Floor, Philadelphia, PA, 19104

\*\* Fox Chase Cancer Center, 333 Cottman Avenue, Philadelphia, PA, 19111

\*\*\* Geisinger Medical Center, 100 North Academy Road, Danville, PA 17822

\*\*\*\* Medical College of Georgia, 1120 North 15<sup>th</sup> St, HH-105, Augusta GA 30912

\*\*\*\*\* Mt. Sinai Medical Center, 4306 Alton Road, Mt. Sinai CCC, Miami Beach, FL 33140

### Abstract

While numerous studies show that higher levels of smoking cessation self-efficacy predicts motivation to quit smoking and successful smoking cessation, few studies have evaluated factors related to smoking cessation self-efficacy that could be targets of behavioral interventions to promote greater confidence to quit smoking. This study, using a large community sample of smokers enrolled in a smoking cessation treatment program, evaluated potential associations between self-efficacy to quit smoking and demographic (e.g., age, race), smoking-related (e.g., rate, cessation history, past use of treatments), and psychosocial (e.g., stress, cue reactivity, self-medication smoking) variables. The results indicated that Hispanic-American smokers, relative to smokers of other racial/ethnic groups, report significantly lower self-efficacy to quit smoking when facing internal stimuli (e.g., feeling depressed), as do smokers who report that they have little confidence to control abstinence-induced symptoms ( $F(9,576) = 6.9, p < .001$ ). The results also indicated that smokers who reported that they have little confidence to control abstinence-induced symptoms and report high smoking urge reactivity to situations that illicit positive affect (e.g., at a bar, with coffee, at a party) report lower self-efficacy to quit smoking when facing external stimuli (e.g., during a celebration;  $F[7,600] = 9.05, p < .05$ ). These findings can be used to refine behavioral smoking cessation interventions to increase self-efficacy to quit smoking.

### Keywords

self-efficacy; smoking; tobacco; perceived control; cue reactivity

---

<sup>1</sup>This study was funded by grant RSGPB-05-240-01-CPPB to Dr. Schnoll from the American Cancer Society and National Institutes of Health grant U10 101178 to Dr. Paul Engstrom.

<sup>2</sup>Corresponding Authors: Elisa Martinez, MPH, Department of Psychiatry, University of Pennsylvania, 3535 Market Street, 4<sup>th</sup> Floor, Philadelphia, PA, 19104; Telephone: 215-746-3109; Fax: 215-746-7140; emart@mail.med.upenn.edu. Robert A. Schnoll, Ph.D., Department of Psychiatry, University of Pennsylvania, 3535 Market Street, 4<sup>th</sup> Floor, Philadelphia, PA, 19104; Telephone: 215-746-7143; Fax: 215-746-7140; schnoll@mail.med.upenn.edu.

**Publisher's Disclaimer:** This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## 1. Introduction

Many behavioral smoking cessation interventions help smokers strengthen their self-efficacy to quit smoking (Hyde, Hankins, Deal, & Marteau, 2008). Self-efficacy predicts motivation to quit smoking and post-treatment outcome (Baer, Holt, & Lichtenstein, 1986; Prochaska, Crimi, Lapsansky, Martel, & Reid, 1982; McIntyre, Lichtenstein, & Mermelstein, 1983; O'Hea et al., 2004). Guidelines to promote self-efficacy to quit smoking suggest discussing past successful quit attempts and a quit plan (Fiore et al., 2008). Additional recommendations are needed to improve interventions for self-efficacy to quit smoking.

Relatively few studies have examined correlates of smoking cessation self-efficacy, especially among large diverse samples of smokers. Smoking cessation self-efficacy has been related to smoking-related (Scholte & Breteler, 1997; John, Meyer, Rumpf, & Hapke, 2004; Berg, Sanderson Cox, Mahnken, Greiner, & Ellerbeck, 2008) and demographic (Berg et al., 2008; Ma, Fang, Knauer, Tan, & Shive, 2006) variables. Fewer studies have associated psychosocial variables which could be targeted by an intervention to enhance self-efficacy. Studies have associated depression symptoms (John et al., 2004; Berg et al., 2008) and situational smoking cues (e.g., at a bar) with smoking cessation self-efficacy (Gwaltney et al., 2001; Gwaltney, Shiffman, & Sayette, 2005).

The Theory of Planned Behavior (Ajzen, 1991) argues that a greater sense of personal control is linked with greater adherence to health behaviors including smoking cessation (Taylor, 2002). The self-medication hypothesis of nicotine dependence argues that nicotine is used to alleviate emotional distress and augment cognitive function (Carmody, 1989; Hughes, 1988; Lerman et al., 1996). Lastly, internal (e.g., negative affect; Brandon, Wetter, & Baker, 1996; Tiffany & Drobes, 1990) and external (e.g., sight of others smoking; Niaura, Abrams, Pedraza, Monti, & Rohsenow, 1992; Sayette & Hufford, 1994; Tiffany & Hakenewerth, 1991) cues elicit smoking urges and reactivity to these cues precipitates relapse (Brandon, Piasecki, Quinn & Baker, 1995). Based on these models, we investigated the following potential correlates of smoking cessation self-efficacy: 1) smoking to augment cognitive function, 2) smoking to alleviate negative affect, 3) perceived stress, 4) perceived control over abstinence-induced symptoms, and 5) cue reactivity. Smoking-related and demographic correlates of cessation self-efficacy were also examined.

## 2. Methods

### 2.1. Subjects

Participants were enrolled in a randomized smoking cessation trial comparing 12 weeks of nicotine patch (Nicoderm CQ) to nicotine lozenge (COMMIT) implemented through the National Cancer Institute Community Clinical Oncology Program (CCOP) coordinated by Fox Chase Cancer Center. The CCOP conducts cancer treatment and prevention trials in community settings, bringing interventions under-served individuals.

To be eligible, participants had to be able to communicate in English, be  $\geq 18$  years of age, plan to reside in the area for 6 months, smoke  $\geq 10$  cigarettes on average/day, and be willing to defer other forms of smoking cessation treatments for 6 months.

1299 individuals were screened for this trial; 454 individuals were ineligible, 194 refused enrollment, and 651 were randomized. Nine individuals withdrew prior to treatment or were found to be ineligible after randomization and were removed from the intent-to-treat (ITT) sample. The final ITT sample was 642 (Table 1). For this study, only data from the baseline assessment were utilized.

## 2.2. Measures

**2.2.1. Demographics**—Demographic data were recorded for all participants.

**2.2.2. Smoking Variables**—Smoking history, such as age when they started smoking, was assessed. The Fagerström Test for Nicotine Dependence assessed nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). Participants indicated the types of smoking cessation treatments previously used, which were categorized as approved (i.e., NRT, bupropion, varenicline, behavioral counseling) or unapproved (i.e., hypnosis, acupuncture, cold-turkey, self-help; Fiore et al., 2008).

**2.2.3. Self-Medication**—The Reasons for Smoking Scale (Horn & Waingrow, 1966) assessed use of tobacco to alleviate negative affect or augment cognitive function (Lerman, et al., 1996). This scale has been associated with level of nicotine dependence and has been shown to be a mediator between depression and smoking (Lerman, et al., 1996; 1998).

**2.2.4. Perceived Control Over Abstinence-Induced Symptoms**—A 4-item survey designed for this study was used. Items were measured on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree (e.g., “I feel like I have control over my feelings of withdrawal from cigarettes”). A summed score was computed by adding the responses to the 4 items (Chronbach’s  $\alpha = .87$ ).

**2.2.5. Perceived Stress**—Stress was evaluated using the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), which has been used in smoking cessation trials and possesses good psychometric qualities (Abrams et al., 2003).

**2.2.6. Cue Reactivity**—The temptations scale (Velicer, Diclemente, Rossi, & Prochaska, 1990) assessed reactivity to smoking cues. This scale has three sub-scales, representing cues related to positive affect and social situations, negative affect, and habit. This scale predicts relapse to smoking following treatment (Velicer et al., 1990).

**2.2.7. Self-efficacy**—The Smoking Self-efficacy Questionnaire assessed self-efficacy (SSQ; Etter, Bergman, Humair, & Perneger, 2000); both subscales (internal vs. external stimuli) have good reliability and validity in smoking cessation trials (Etter et al., 2000).

## 2.3. Data Analysis

Descriptive statistics characterized the sample. We conducted bivariate analyses using Pearson correlation and ANOVA to identify correlates of self-efficacy (internal and external separately). Variables that were associated with self-efficacy at  $p < .10$  were included in subsequent multivariate analyses. Multivariate linear regression analyses were conducted to identify correlates of internal and external smoking cessation self-efficacy, separately. Site was entered for each model to control for any variability in measures across site.

## 3. Results

### 3.1. Description of Sample

Table 1 displays the characteristics of the study participants.

### 3.2 Bivariate Correlations with Self-efficacy

Sex, marital status, education level, and income were not related to internal self-efficacy ( $p > .05$ ). Race/ethnicity was associated with internal self-efficacy ( $F[3,627] = 5.45, p < .01$ ). None of the smoking-related variables were associated with internal self-efficacy ( $p > .05$ ) except

for level of nicotine dependence. Participants with higher levels of nicotine dependence reported lower levels of internal smoking cessation self-efficacy ( $r = -.11, p < .01$ ). In contrast, higher internal self-efficacy was associated with lower smoking for negative affect reduction ( $r = -.20, p < .001$ ), lower perceived stress ( $r = -.20, p < .001$ ), lower positive affect and social situations cues ( $r = -.15, p < .001$ ), lower negative affect cues ( $r = -.23, p < .001$ ), and lower habit cues ( $r = -.18, p < .001$ ), as well as higher levels of perceived control over abstinence-induced symptoms ( $r = .20, p < .001$ ).

Sex, marital status, and income were not related to external self-efficacy ( $p > .05$ ). Education was associated with external self-efficacy ( $F[4,628] = 2.05, p < .10$ ) as was race/ethnicity ( $F[3,633] = 2.7, p < .05$ ). None of the smoking-related variables were associated with external self-efficacy ( $p > .05$ ). In contrast, higher external self-efficacy was associated with higher levels of perceived control over abstinence-induced symptoms ( $r = .17, p < .001$ ), and lower levels of positive affect and social situations cues ( $r = -.28, p < .01$ ), lower negative affect cues ( $r = -.12, p < .001$ ), and lower habit cues ( $r = -.15, p < .001$ ).

### 3.3. Multivariate Correlations with Self-efficacy

Table 2 shows the results of the multivariate linear regression for internal smoking cessation self-efficacy, which included variables identified in the bivariate analyses as correlates of internal self-efficacy ( $p < .10$ ) and recruitment site. The model significantly predicted internal self-efficacy ( $F[9,576] = 6.9, p < .001$ ). Higher levels of internal self-efficacy were predicted by race/ethnicity and higher levels of perceived control over abstinence-induced symptoms (Table 2). Tukey HSD tests for race/ethnicity indicates that Hispanic participants in this trial reported significantly lower mean internal self-efficacy ( $M = 8.2$ ) vs. African American ( $M = 11.3$ ), Caucasian ( $M = 11.3$ ), and those with other race/ethnicity backgrounds ( $M = 11.9$ ).

Table 2 shows the results of the multivariate linear regression for external smoking cessation self-efficacy, which included variables identified in the bivariate analyses as correlates of external self-efficacy ( $p < .10$ ) and recruitment site. The model significantly predicted external self-efficacy ( $F[7,600] = 9.05, p < .001$ ). Higher levels of external self-efficacy was predicted by higher levels of perceived control over abstinence-induced symptoms and higher levels of reactivity to positive affect and social cues (Table 2).

## 4. Discussion

This study evaluated factors related to internal and external self-efficacy to quit smoking in a large, diverse sample of community smokers. The results could be used to design behavioral interventions to promote self-efficacy to quit smoking, a critical predictor of success among smokers trying to quit. The findings indicate that behavioral approaches to enhancing smoking cessation self-efficacy may be effective if techniques are included to help smokers develop a sense of perceived control over abstinence-induced symptoms and help smokers to manage cravings stimulated by positive affect/social situation smoking cues. In addition, techniques to enhance smoking cessation self-efficacy need to be targeted, in particular, to Hispanic smokers.

Participants who reported higher levels of perceived control over symptoms that arise following abstinence (i.e., withdrawal, irritability, depressed mood) reported higher internal and external self-efficacy. This finding suggests that participants with low perceived control over withdrawal symptoms may benefit from an initial counseling session that focuses on ways to enhance control over, and mitigate the effects of, withdrawal symptoms. This result converges well with the Theory of Planned Behavior (Ajzen, 1991), which emphasizes the role played by a greater sense of personal control in determining adherence to health behaviors including achieving abstinence from tobacco use (Taylor, 2002).

Likewise, participants who reported lower reactivity to positive affect/social situation smoking cues also exhibited higher levels of smoking cessation self-efficacy, although this relationship was confined to external self-efficacy. This certainly makes sense given that the cues indicated on the positive affect/social cue subscale are generally external situations related to smoking and the items from the external self-efficacy subscale concern confidence to resist smoking in environmental situations. There was some indication of the converse of this relationship; that is, the relationship between the internal self-efficacy subscale and reactivity to negative affect cues approached significance ( $p = .07$ ; Table 2). Thus, the link between cue reactivity and smoking cessation self-efficacy may be segmented into domains based on internal states vs. external events or situations. Consistent with studies that emphasize the role of cue reactivity in the treatment of nicotine dependence and other drug addictions (Carter & Tiffany, 1999), interventions to promote smoking cessation self-efficacy should address cue reactivity as well but in a manner that focuses on developing competency and confidence in dealing with both internal and external smoking-related states and situations.

Lastly, the results indicated that Hispanic/Latino American smokers have significantly lower levels of internal smoking cessation self-efficacy vs. smokers in other ethnic/racial groups. This converges with data showing that Hispanic/Latino smokers show a poorer response to pharmacotherapies for nicotine dependence (Covey, et al., 2008). Significantly lower levels of smoking cessation self-efficacy among Hispanic/Latino smokers may increase their vulnerability to smoking relapse while attempting to quit smoking using treatments for nicotine dependence. Thus, this sub-group of smokers may need targeted counseling to promote smoking cessation self-efficacy to enhance their chances for successful smoking cessation. This may require the development of tailored smoking cessation counseling content in Spanish and the development of culturally-specific counseling that would help Hispanic-Americans develop smoking cessation self-confidence, particularly with regard to internal stimuli related to smoking behavior.

This study is limited by the cross-sectional nature of the data. Additionally, a small number of correlates of self-efficacy was examined. Further, all measures were self-report and subject to biases. Lastly, participants were treatment-seeking smokers. Nevertheless, this study used a large and demographically diverse sample to address an under-studied construct predictive of smoking behavior and response to treatments for nicotine dependence. This study also focused on internal and external smoking cessation self-efficacy. Thus, these findings may be relatively more generalizable to the population of US treatment-seeking smokers and provide useful data for the development of behavioral treatments for nicotine dependence that focus on enhancing smoker self-efficacy to quit smoking. The development and evaluation of future behavioral treatments to enhance self-efficacy to quit smoking may contribute to the ongoing decrease in smoking prevalence rates in the US.

## Acknowledgments

The authors thank the following principal investigators and staff at participating sites of the Community Clinical Oncology Program (CCOP): Dr. Jeffrey Kirshner at Hematology Oncology Associates of Central New York; Dr. Carla Williams at Howard University Cancer Center; Dr. Glen Mills at Louisiana State University; Dr. Paul Gilman at Main Line Health; Dr. Steven Wolf at Meharry Medical College; Dr. Vincent Vinciguerra at North Shore University; Dr. Karen Benker at SUNY Downstate; and Dr. Alan Weinstein at Virtua Health. We also thank Jeanne Pomenti for technical assistance throughout the trial and the FCCC Population Studies Facility for data management. The participating CCOP sites were: FCCC (Philadelphia, PA), Geisinger Medical Center (Danville, PA), Hematology Oncology Associates of Central New York (Syracuse, NY), Howard University (Washington, DC), Louisiana State University (Shreveport, LA), Main Line Health System (Wynnewood, PA), Medical College of Georgia (Augusta, GA), Meharry Medical College (Nashville, TN), Mount Sinai Medical Center (Miami, FL), North Shore University Hospital (Lake Success, NY), SUNY Downstate Medical Center (Brooklyn, NY), and Virtua Health (Mt. Holly, NJ).



## References

- Abrams, DB.; Niaura, R.; Brown, RA.; Emmons, KM.; Goldstein, MG.; Monti, PM. The Tobacco Dependence Treatment Handbook: A Guide to Best Practices. New York: The Guilford Press; 2003.
- Ajzen I. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes* 1991;50:179–211.
- Baer JS, Holt CS, Lichtenstein E. Self-efficacy and smoking reexamined: construct validity and clinical utility. *Journal of Consulting and Clinical Psychology* 1986;54(6):846–852. [PubMed: 3794032]
- Berg CJ, Sanderson Cox L, Mahnken JD, Greiner KA, Ellerbeck EF. Correlates of self-efficacy among rural smokers. *Journal of Health Psychology* 2008;13(3):416–421. [PubMed: 18420774]
- Brandon, TH.; Piasecki, TM.; Quinn, E.; Baker, TB. Cue exposure treatment in nicotine dependency. In: Drummond, DC.; Remington, B.; Tiffany, S., editors. *Addictive behaviour: Cue exposure theory and practice*. New York: Wiley; 1995.
- Brandon TH, Wetter DW, Baker TB. Affect, expectancies, urges, and smoking: Do they conform to models of drug motivation and relapse? *Experimental and Clinical Psychopharmacology* 1996;4:29–36.
- Carmody TP. Affect regulation, nicotine addiction, and smoking cessation. *Journal of Psychoactive Drugs* 1989;21(3):331–342. [PubMed: 2681631]
- Carter BL, Tiffany ST. Meta-analysis of cue-reactivity in addiction research. *Addiction* 1999;94(3):327–340. [PubMed: 10605857]
- Cohen J, Kamarck T, Mermelstein RJ. A global measure of perceived stress. *Journal of Health and Social Behavior* 1983;24:385–396. [PubMed: 6668417]
- Covey LS, Botello-Harbaum M, Glassman AH, Masmela J, LoDuca C, Salzman V, et al. Smokers' response to combination bupropion, nicotine patch, and counseling treatment by race/ethnicity. *Ethnicity and Disease* 2008;18(1):59–64. [PubMed: 18447101]
- Etter JF, Bergman MM, Humair JP, Perneger TV. Development and validation of a scale measuring self-efficacy of current and former smokers. *Addiction* 2000;95(6):901–913. [PubMed: 10946439]
- Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. *Treating tobacco use and dependence:2008 update*. 2008
- Gwaltney CJ, Shiffman S, Norman GJ, Paty JA, Kassel JD, Gnys M, et al. Does smoking abstinence self-efficacy vary across situations? Identifying context-specificity within the Relapse Situation Efficacy Questionnaire. *Journal of Consulting and Clinical Psychology* 2001;69(3):516–527. [PubMed: 11495181]
- Gwaltney CJ, Shiffman S, Sayette MA. Situational correlates of abstinence self-efficacy. *Journal of Abnormal Psychology* 2005;114(4):649–660. [PubMed: 16351386]
- Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addiction* 1991;86(9):1119–1127. [PubMed: 1932883]
- Horn D, Waingrow S. Some dimensions of a model for smoking behavior change. *American Journal of Public Health* 1966;56(12):21–56. [PubMed: 5951587]Supplement
- Hughes JR. Clonidine, depression, and smoking cessation. *Journal of the American Medical Association* 1988;259(19):901–2902.
- Hyde J, Hankins M, Deale A, Marteau TM. Interventions to increase self-efficacy in the context of addiction behaviours: a systematic literature review. *Journal of Health Psychology* 2008;13(5):607–623. [PubMed: 18519435]
- John U, Meyer C, Rumpf HJ, Hapke U. Self-efficacy to refrain from smoking predicted by major depression and nicotine dependence. *Addictive Behaviors* 2004;29(5):857–866. [PubMed: 15219330]
- Lerman C, Audrain J, Orleans CT, Boyd R, Gold K, Main D, et al. Investigation of mechanisms linking depressed mood to nicotine dependence. *Addictive Behaviors* 1996;21(1):9–19. [PubMed: 8729703]
- Lerman C, Caporaso N, Main D, Audrain J, Boyd NR, Bowman ED, et al. Depression and self-medication with nicotine: the modifying influence of the dopamine D4 receptor gene. *Health Psychology* 1998;17(1):56–62. [PubMed: 9459071]

- Ma GX, Fang CY, Knauer CA, Tan Y, Shive SE. Tobacco dependence, risk perceptions and self-efficacy among Korean American smokers. *Addictive Behaviors* 2006;31(10):1776–1784. [PubMed: 16457961]
- McIntyre KO, Lichtenstein E, Mermelstein RJ. Self-efficacy and relapse in smoking cessation: a replication and extension. *Journal of Consulting and Clinical Psychology* 1983;51(4):632–633. [PubMed: 6619375]
- Niaura R, Abrams DB, Pedraza M, Monti PM, Rohsenow DJ. Smokers' reactions to interpersonal interaction and presentation of smoking cues. *Addictive Behaviors* 1992;17(6):557–566. [PubMed: 1488936]
- O'Hea EL, Boudreaux ED, Jeffries SK, Carmack Taylor CL, Scarinci IC, Brantley PJ. Stage of change movement across three health behaviors: the role of self-efficacy. *American Journal of Health Promotion* 2004;19(2):94–102. [PubMed: 15559709]
- Prochaska JO, Crimi P, Lapsanski D, Martel L, Reid P. Self-change processes, self-efficacy and self-concept in relapse and maintenance of cessation of smoking. *Psychological Reports* 1982;51(3 Pt 1): 983–990. [PubMed: 7163454]
- Sayette MA, Hufford MR. Effects of cue exposure and deprivation on cognitive resources in smokers. *Journal of Abnormal Psychology* 1994;103(4):812–818. [PubMed: 7822584]
- Scholte RH, Breteler MH. Withdrawal symptoms and previous attempts to quit smoking: associations with self-efficacy. *Substance Use and Misuse* 1997;32(2):133–148. [PubMed: 9044543]
- Taylor, SE. *Health psychology*. Vol. 5. New York: McGraw-Hill; 2002.
- Tiffany ST, Drobes DJ. Imagery and smoking urges: the manipulation of affective content. *Addictive Behaviors* 1990;15(6):531–539. [PubMed: 2075850]
- Tiffany ST, Hakenewerth DM. The production of smoking urges through an imagery manipulation: psychophysiological and verbal manifestations. *Addictive Behaviors* 1991;16(6):389–400. [PubMed: 1801563]
- Velicer WF, Diclemente CC, Rossi JS, Prochaska JO. Relapse situations and self-efficacy: an integrative model. *Addictive Behaviors* 1990;15(3):271–283. [PubMed: 2378287]

**Table 1**

Characteristics of Study Participants (N = 642)

Variable	N or Mean and Range	% or SD
<i>Sex</i>		
Male	277	43.1
Female	365	56.9
<i>Race-Ethnicity</i>		
Black	127	19.8
White	407	63.4
Hispanic**	79	12.3
Other	29	4.5
<i>Marital Status</i> *		
Single	148	23.1
Married	305	47.5
Divorced	127	19.8
Separated	33	5.1
Widowed	28	4.4
<i>Income</i>		
< \$15,000	85	13.2
\$15,001–\$30,000	98	15.3
\$30,001–\$45,000	146	22.7
\$45,001–\$60,000	95	14.8
\$60,001–\$75,000	70	10.9
> \$75,000	135	21.0
<i>Education</i> *		
< 11 Years	49	13
High School Grad	139	36
Some College or Vocational/Technical	291	5
College Grad	126	23
Graduate Degree	33	12
<i>Age</i>	44.7(18–80)	12.3
<i>FTND</i> *		
Very Low	79	12.3
Low	167	26.0
Medium	120	18.7
High	172	26.8
Very High	86	13.4
<i>Number of Cigarettes/Day Past 30 Days</i>	20.3 (10–80)	9.1
<i>Age Started Smoking</i>	16.9 (6–49)	4.9
<i>Number of Years Smoked</i>	26.7 (2–71)	12.9
<i>Number of Previous 24-hour Quit Attempts</i>	5.47 (0–100)	10.6
<i>Longest Duration of Previous Quit Attempt (Days)</i>	350.8 (0–5000)	810.6
<i>Number of Smokers in Household</i>	.47 (0–6)	.76
<i>Use of Past Approved Treatments for Nicotine Dependence</i>		
Yes	308	48.0
No	334	52.0
<i>Use of Past Unapproved Treatments for Nicotine Dependence</i>		
Yes	463	72.1
No	179	27.9
<i>Smoking for Cognitive Enhancement</i>	9.6 (4–16)	3.3
<i>Smoking for Negative Affect Reduction</i>	9.7 (3–12)	2.3
<i>Perceived Control over Abstinence-Induced Symptoms</i>	12.3 (4–20)	3.8
<i>Perceived Stress</i>	6.3 (0–16)	3.5
<i>Reactivity to Positive Affect/Social Cues</i>	20.4 (6–30)	5.3
<i>Reactivity to Negative Affect Cues</i>	22.7 (6–30)	5.7
<i>Reactivity to Habit Cues</i>	16.1 (5–25)	4.5
<i>Internal Self-efficacy</i>	10.9 (0–24)	6.5
<i>External Self-efficacy</i>	10.6 (0–24)	7.1

\* Note. Indicates missing data (< 3)

\*\* Asian American, American Indian or Alaskan Native, Hawaiian or Pacific Islander, More than one race, or Other.



**Table 2**

Multivariate Linear Regression Analysis Predicting Smoking Internal Self-efficacy (Top) and External Self-efficacy (Bottom)

Predictor Variable	B	t	p	95% CI
Site	-.017	-0.415	.68	-0.21 to 0.13
Race/Ethnicity	-.128	-3.17	.002	-1.57 to -0.37
FTND	-.03	-0.66	.51	-0.61 to 0.31
Smoking for Negative Affect Reduction	-.07	-1.25	.21	-0.5 to 0.11
Perceived Control over Abstinence-Induced Symptoms	.15	3.46	.001	0.11 to 0.4
Perceived Stress	-.031	-0.69	.49	-0.24 to 0.11
Reactivity to Positive Affect/Social Cues	.036	0.66	.51	-0.09 to 0.18
Reactivity to Negative Affect Cues	-.125	-1.84	.07	-0.29 to 0.01
Reactivity to Habit Cues	-.02	-0.32	.75	-0.21 to 0.15
Site	-.042	-1.04	.30	-0.28 to 0.97
Race/Ethnicity	-.044	-1.12	.27	-1.01 to 0.28
Education	-.078	-1.95	.052	-1.15 to 0.004
Perceived Control over Abstinence-Induced Symptoms	.10	2.29	.023	0.03 to 0.33
Reactivity to Positive Affect/Social Cues	-.27	-5.06	.0001	-0.51 to -0.23
Reactivity to Negative Affect Cues	.01	0.23	.82	-0.11 to 0.14
Reactivity to Habit Cues	.05	-0.78	.43	-0.11 to 0.25

Note. Model for Internal Self-efficacy:  $F(9,576) = 6.9$ ,  $p < .001$ ; model for External Self-efficacy:  $F(7,600) = 9.05$ ,  $p < .001$ ; FTND = Fagerstrom Test for Nicotine Dependence.