

Brief Report

The Association Between Implicit and Explicit Attitudes Toward Smoking and Support for Tobacco Control Measures

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Abstract

Introduction: This study examined the association between implicit and explicit attitudes toward smoking and support for tobacco control policies.

Methods: Participants were from an ongoing longitudinal study of the natural history of smoking who also completed a web-based assessment of implicit attitudes toward smoking ($N = 1,337$). Multiple regression was used to test the association between covariates (sex, age, educational attainment, parent status, and smoking status), implicit attitude toward smoking, and explicit attitude toward smoking and support for tobacco control policies. The moderating effect of the covariates on the relation between attitudes and support for policies was also tested.

Results: Females, those with higher educational attainment, parents, and nonsmokers expressed more support for tobacco control policy measures. For nonsmokers, only explicit attitude was significantly associated with support for policies. For smokers, both explicit and implicit attitudes were significantly associated with support. The effect of explicit attitude was stronger for those with lower educational attainment.

Conclusions: Both explicit and implicit smoking attitudes are important for building support for tobacco control policies, particularly among smokers. More research is needed on how to influence explicit and implicit attitudes to inform policy advocacy campaigns.

Introduction

Tobacco control policies have been shown to be effective in reducing smoking. There is significant evidence that laws that restrict smoking in public places and workplaces result in less smoking (Bauer, Hyland, Li, Steger, & Cummings, 2005; Fichtenberg & Glantz, 2002; Hahn et al., 2008; Moskowitz, Lin, &

Hudes, 2000), and policy-based approaches have been shown to reduce youth tobacco use (Forster, Widome, & Bernat, 2007). Despite these successes, there is not always widespread support for tobacco control policies. Poland et al. (2000) found that certain segments of both the smoking and nonsmoking populations were relatively unsupportive of smoking restrictions. Recent research found a lack of support for restrictions on point-of-sale tobacco product marketing (Schmitt, Elek, Duke, & Watson, 2010). Therefore, effective tobacco control policy campaigns must build grass roots support (Cummings et al., 1991) to convince policymakers to enact legislation and to succeed with ballot initiatives or referenda.

Thus, an understanding of the modifiable determinants of support for tobacco control policies is needed. Several studies have examined factors associated with support for policies. In terms of sociodemographic characteristics, support is more likely among females (Bernat, Klein, Fabian, & Forster, 2009; Doucet, Velicer, & Laforge, 2007; Hamilton, Biener, & Rodger, 2005; Osypuk & Acevedo-Garcia, 2010), racial/ethnic minorities (Doucet et al., 2007; Hamilton et al., 2005; Osypuk & Acevedo-Garcia, 2010), those with more education (Bernat et al., 2009; Doucet et al., 2007; Hamilton et al., 2005), and those with children (Hamilton et al., 2005). Findings regarding age have differed depending on the policy measure, with younger adults more likely to support a tobacco tax increase (Hamilton et al., 2005) and older adults more supportive of restrictions on advertising and promotion, increasing public education, and increasing environmental restrictions (Doucet et al., 2007).

Findings have consistently demonstrated that smokers are more likely to oppose tobacco control policies (Ashley, Bull, & Pederson, 1995; Bernat et al., 2009; Blake, Viswanath, Blendon, & Vallone, 2010; Clegg Smith et al., 2008; Hamilton et al., 2005; Osypuk & Acevedo-Garcia, 2010; Poland et al., 2000; Quick, Bates, & Romina, 2009; Schumann et al., 2006). Also, knowledge of the negative effects of tobacco was associated with positive attitudes toward tobacco control (Blake et al., 2010). Finally, a longitudinal study showed that more negative attitudes toward

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smoking, measured both in adolescence and adulthood, predicted support for tobacco control policies (Macy, Chassin, & Presson, 2011).

Importantly, however, Macy et al. (2011) used an explicit measure of attitudes, in which participants were directly asked to report their attitude. Although explicit attitudes have been shown to be important predictors of behavior in general (Ajzen & Fishbein, 1977), they may not be sufficient for predicting support of tobacco control. Explicit measures capture only attitudes that are in conscious awareness (and which individuals are willing to disclose). However, dual process models and supporting data have shown that both conscious, reflective processes and automatic associations are important predictors of behavior (Wiers & Stacy, 2006). Implicit measures reflect more automatic evaluative associations with the target object that are not under conscious control and are also less susceptible to social desirability concerns. Dual process models predict that both explicit and implicit measures of attitudes should be important predictors of support for tobacco control. Indeed, research suggests that implicit attitudes are related to multiple aspects of smoking behavior (see Waters & Sayette, 2006 for a review). Prior studies have found that smokers are less negative than nonsmokers in both implicit and explicit attitudes (Huijding, de Jong, Wiers, & Verkooijen, 2005; Sherman, Rose, Koch, Presson, & Chassin, 2003; Swanson, Rudman, & Greenwald, 2001). Data from our laboratory have shown that implicit attitudes toward smoking prospectively predicted both smoking initiation among adolescents (Sherman, Chassin, Presson, Seo & Macy, 2009) and smoking cessation among adults (Chassin, Presson, Sherman, Seo, & Macy, 2010). These studies and the current study measured implicit attitudes toward smoking with the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The IAT is a computer-based task that indirectly measures the strengths of associations among concepts by requiring participants to sort stimuli (Nosek, Greenwald, & Banaji, 2006). In the case of the smoking IAT, the task assesses the association strengths between images of smoking and shapes (the contrast category) and positive and negative words. To the extent that individuals have faster reaction times when matching smoking images with positive words than with negative words, they have positive implicit attitudes toward smoking.

In summary, support from both smokers and nonsmokers is needed to enact strong tobacco control policies. Building such support requires more refined knowledge about predictors of support. The current study extends previous work by testing the hypothesis that both explicit and implicit attitudes toward smoking will significantly predict support for tobacco control measures.

Methods

Sample

Participants were from an ongoing cohort sequential study of the natural history of smoking (Chassin, Presson, Sherman, & Pitts, 2000). Between 1980 and 1983, all consenting 6th to 12th graders in a Midwestern U.S. school system completed annual surveys. The total sample size of those assessed at least once was 8,487. Follow-up surveys were conducted in 1987, 1993, 1999, and 2005. Additional information about the sample, including

data collection procedures, representativeness, and attrition bias, has been published elsewhere (Chassin et al., 2000, 2008, 2010; Rose, Chassin, Presson, & Sherman, 1996). Although the sample is representative of the community from which it is drawn, it is 96% non-Hispanic Caucasian, so that it is not feasible to include race and ethnicity as predictor variables in the current study.

In 2005, smoking and nonsmoking participants who had adolescent children, participants who smoked but were not parents of an adolescent, and a random sample of participants who were neither smokers nor parents were recruited to a web-based study. The primary objective of the study was to test the role of implicit attitudes in smoking cessation, adolescent smoking onset, and parents' antismoking messages. For the current study, we selected participants who completed both the longitudinal study follow-up, in which support for tobacco control measures were reported and the web-based assessment of implicit attitude toward smoking. This yielded a sample of 1,337 adults.

Measures

Demographics

Participants reported their sex (60% female), age (mean = 38.1, range 33–44), the number of children they had, and the highest level of education completed using 11 categorical educational response options. For analyses, educational attainment was dichotomized into less than a bachelor's degree (62%) versus bachelor's degree or higher (38%), and parent status was dichotomized into nonparents (those with zero children [18%]) versus parents (those with one or more children [82%]).

Smoking Status

Participants self-reported their smoking status. Those who smoked at least monthly (35%) were classified as current smokers. Of the current smokers, 70% were regular daily smokers who smoked at least 10 cigarettes/day, and 30% were nondaily smokers or those who smoked less than 10 cigarettes/day. The regular smokers did not significantly differ from the light smokers in sex, age, parent status, explicit attitude toward smoking, and implicit attitude toward smoking (χ^2 and t tests, all $p > .06$). However, the light smokers had higher educational attainment, $\chi^2(1) = 55.23, p < .001$.

Explicit Attitude Toward Smoking

Participants reported their global attitude toward smoking using a semantic differential measure of smoking as "nice versus awful," "pleasant versus unpleasant," and "fun versus not fun" (Ajzen & Fishbein, 1970). This measure has been used at each wave of the Indiana University Smoking Survey and has successfully prospectively predicted smoking transitions (Chassin, Presson, Sherman, Corty, & Olshavsky, 1984), thus demonstrating its predictive validity. Responses to the three items were averaged ($\alpha = .90$). The overall mean was 4.13 ($SD = 0.93$, range 1–5). A higher value indicated a more negative attitude toward smoking.

Implicit Attitude Toward Smoking

Participants completed an implicit measure of attitude toward smoking using an IAT (Greenwald et al., 1998), which was administered online through Project Implicit's Virtual Laboratory (Nosek, Greenwald, & Banaji, 2005). A complete description of this implicit attitude measure has been published elsewhere (Chassin et al., 2010). We calculated an IAT D score for each

participant using a standard scoring algorithm (Greenwald, Nosek, & Banaji, 2003). The overall mean IAT score in this sample was .014 ($SD = 0.97$, range -3.52 to 2.45). A higher value indicated a more negative attitude toward smoking.

Support for Tobacco Control Measures

Participants reported support for six tobacco control policy interventions (regulating smoking in public places, requiring public schools to discuss dangers of smoking, prohibiting smoking in bars, eliminating smoking on television and in movies, prohibiting smoking in restaurants, and increasing taxes on cigarettes) on a 5-point scale from *strongly disagree* to *strongly agree*. Exploratory factor analysis revealed a one-factor solution (first eigenvalue = 3.35) explaining 55.8% of the total variance with factor loadings ranging from .52 to .86. Therefore, responses to the six items were averaged ($\alpha = .84$) to create a composite measure of support. The overall mean was 3.66 ($SD = .89$, range 1–5). A higher value indicated more support for tobacco control measures.

Analysis

Multiple regression was used to test the association between the predictor variables and support for tobacco control policies. We included known correlates of support (sex, age, educational attainment, parent status, and smoking status) as covariates in the model and tested the unique effects of implicit and explicit attitudes, the predictor variables of interest for the current study. All two-way covariate by attitude interactions were tested. Interaction terms were computed with mean-centered variables. Non-significant interactions were trimmed from the final model.

Results

Table 1 displays the results for the multiple regression model ($r^2 = .44$). Females, those with higher educational attainment, parents, and nonsmokers, reported more support for tobacco control measures. In terms of attitudes, there was a significant main effect of explicit attitude toward smoking such that those with a more negative explicit attitude toward smoking reported more support.

In addition, there were significant smoking by implicit attitude and smoking by explicit attitude interactions. To probe these interactions, we split the sample by smoking status to test the association between implicit and explicit attitudes and support for policies, separately for smokers and nonsmokers. Explicit attitude toward smoking was significantly associated with support for tobacco control measures for both smokers ($\beta = .271$, $SE = 0.046$, $p < .001$) and nonsmokers ($\beta = .481$, $SE = 0.036$, $p < .001$). However, the magnitude of the effect was greater among nonsmokers. Implicit attitude toward smoking was significantly associated with support for tobacco control measures among smokers ($\beta = .074$, $SE = 0.033$, $p = .026$) but not among nonsmokers ($\beta = .004$, $SE = 0.024$, $p = .866$). We also tested whether the correlation between implicit and explicit attitudes differed for smokers ($r = .061$, $p = .069$) versus nonsmokers ($r = .116$, $p = .013$). The difference between these correlation coefficients was not statistically significant ($z = .096$, $p = .17$).

The interaction of educational attainment and explicit attitude was the only interaction between a demographic characteristic

Table 1. Results for Regression Model Predicting Support for Tobacco Control Measures

Predictor	β (SE)
Sex (0 = male, 1 = female)	.150 (0.038)***
Age	-.005 (0.007)
Education (0 = less than BA, 1 = BA or higher)	.246 (0.039)***
Parent status (0 = no, 1 = yes)	.117 (0.051)*
Smoking status (0 = no, 1 = yes)	-.452 (0.058)***
Implicit attitude toward smoking ^a	.031 (0.019)
Explicit attitude toward smoking ^a	.409 (0.028)***
Smoking by implicit attitude toward smoking	.084 (0.040)*
Smoking by explicit attitude toward smoking	-.279 (0.056)***
Education by explicit attitude toward smoking	-.176 (0.043)***

Note. ^aHigher value indicates more negative attitude toward smoking.

* $p < .05$. *** $p < .001$.

and an attitudinal variable to reach statistical significance. To probe this interaction, we split the sample by education level to test the association between explicit attitude and support for policies, separately for those with low and high educational attainment. Explicit attitude toward smoking was significantly associated with support for tobacco control measures for those with less than a bachelor's degree ($\beta = .413$, $SE = 0.036$, $p < .001$) and those with a bachelor's degree or higher ($\beta = .342$, $SE = 0.045$, $p < .001$). However, the magnitude of the effect was greater among those with less than a bachelor's degree.

Discussion

Our findings concerning the relation between demographic factors and smoking behavior and support for tobacco control policies are consistent with prior research (Ashley et al., 1995; Bernat et al., 2009; Blake et al., 2010; Clegg Smith et al., 2008; Doucet et al., 2007; Hamilton et al., 2005; Osypuk & Acevedo-Garcia, 2010; Poland et al., 2000; Quick et al., 2009; Schumann et al., 2006). Females, those with higher educational attainment, parents, and nonsmokers expressed more support for tobacco control policy measures. The primary objective of the current study, however, was to test the role of explicit and implicit attitudes toward smoking in predicting support for tobacco control policies. There was a significant main effect of explicit attitude on support, and a magnitude interaction with educational attainment suggested that the effect of explicit attitude was stronger for those with lower educational attainment.

We found that smoking status moderated the roles of both explicit and implicit attitudes in predicting support for tobacco control measures. Explicit attitudes were more important for nonsmokers than for smokers but were significant predictors for both groups. In contrast, implicit attitudes were more important for smokers than for nonsmokers and did not significantly predict support for tobacco control measures among nonsmokers. These findings are consistent with dual process models (Wiers & Stacy, 2006) that propose an important role of automatic processes, which are more impulsive and based on automatically

activated associations that may be outside of conscious control, as well as controlled processes, which are reflective and under conscious control, in addictive behaviors. Implicit measures of attitudes rely on automatic evaluative associations that are more likely to tap into automatic processes, whereas explicit measures, in which individuals directly report their evaluations of a target behavior, rely more on conscious, reflective, and controlled processes.

These findings have implications for campaigns aimed at building public support for tobacco control policy initiatives. Our data suggest that to build support among nonsmokers, changing explicit attitudes, which are relatively easy to measure and understand, may be sufficient. Prior research has shown that tobacco-related media exposure influences explicit attitudes toward tobacco control policies (Blake et al., 2010; Clegg Smith et al., 2008; Evans et al., 2006). Increasing antitobacco media coverage may be a useful strategy for both nonsmokers and smokers but especially for nonsmokers. For smokers, establishing support may involve a more complicated process of changing both implicit and explicit attitudes. Social psychological research has found that different methods are required to change the two types of attitudes (Bohner & Dickel, 2011). One dilemma is that methods to change implicit attitudes are often time intensive and individually delivered (e.g., retraining automatic associations), so that they may have limited practicality for large-scale public health interventions. Although past public service announcements have not been effective in changing explicit smoking attitudes (Flay 1987; Wakefield, Flay, Nichter, & Giovino, 2003), one possibility is that media messages could be better constructed using strong message-based rhetorical persuasion, which can change implicit attitudes (Briñol, Petty, & McCaslin, 2009). It may also be useful to choose messages on the basis of their effects on implicit attitudes. Experimental studies conducted in the laboratory or online could test the impact of different media messages aimed at building support for a tobacco control policy on smokers' implicit attitudes.

This study's findings suggest that both explicit and implicit smoking attitudes are important for building support for tobacco control policies, particularly among smokers. More research is needed on how to influence explicit and implicit attitudes toward smoking to inform policy advocacy campaigns looking to create widespread support. For example, there is a need for studies to explore what types of content would be most effective to include in media messages advocating for tobacco control policy change. With increasingly limited resources available for media spending to accompany policy campaigns, it is important to deliver messages with the highest likelihood of motivating individuals to support critical tobacco control policy initiatives.

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Declaration of Interests

None.

References

- Ajzen, I., & Fishbein, M. (1970). The predictions of behavior from attitudinal and normative variables. *Journal of Experimental Social Psychology, 6*, 466–487. doi:10.1016/0022-1031(70)90057-0
- Ajzen, I., & Fishbein, M. (1977). Attitude–behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*, 888–918. doi:10.1037/0033-2909.84.5.888
- Ashley, M. J., Bull, S. B., & Pederson, L. L. (1995). Support among smokers and nonsmokers for restrictions on smoking. *American Journal of Preventive Medicine, 11*, 283–287.
- Bauer, J. E., Hyland, A., Li, Q., Steger, C., & Cummings, M. K. (2005). A longitudinal assessment of the impact of smoke-free worksite policies on tobacco use. *American Journal of Public Health, 95*, 1024–1029. doi:10.2105/AJPH.2004.048678
- Bernat, D. H., Klein, E. G., Fabian, L. E. A., & Forster, J. L. (2009). Young adult support for clean indoor air laws in restaurants and bars. *Journal of Adolescent Health, 45*, 102–104. doi:10.1016/j.jadohealth.2008.12.023
- Blake, K. D., Viswanath, K., Blendon, R. J., & Vallone, D. (2010). The role of tobacco-specific media exposure, knowledge, and smoking status on selected attitudes toward tobacco control. *Nicotine & Tobacco Research, 12*, 117–126. doi:10.1093/ntr/ntp184
- Bohner, G., & Dickel, N. (2011). Attitudes and attitude change. *Annual Review of Psychology, 62*, 391–417. doi:10.1146/annurev.psych.121208.131609
- Briñol, P., Petty, R. E., & McCaslin, M. J. (2009). Changing attitudes on implicit versus explicit measures: What is the difference?. In R. E. Petty, R. H. Fazio, & P. Briñol (Eds.), *Attitudes: Insights from the new implicit measures*. (pp. 285–326). New York: Psychology Press.
- Chassin, L., Presson, C., Seo, D.-C., Sherman, S. J., Macy, J., Wirth, R. J., et al. (2008). Multiple trajectories of cigarette smoking and the intergenerational transmission of smoking: A multigenerational, longitudinal study of a Midwestern community sample. *Health Psychology, 27*, 819–828. doi:10.1037/0278-6133.27.6.819
- Chassin, L., Presson, C. C., Sherman, S. J., Corty, E., & Olshavsky, R. (1984). Predicting the onset of cigarette smoking in adolescents: A longitudinal study. *Journal of Applied Social Psychology, 14*, 224–243. doi:10.1111/j.1559-1816.1984.tb02233.x
- Chassin, L., Presson, C. C., Sherman, S. J., & Pitts, S. (2000). The natural history of cigarette smoking from adolescence to adulthood in a midwestern community sample: Multiple trajectories and their psychosocial correlates. *Health Psychology, 19*, 223–231. doi:10.1037//0278-6133.19.3.223
- Chassin, L., Presson, C. C., Sherman, S. J., Seo, D.-C., & Macy, J. T. (2010). Implicit and explicit attitudes predict smoking cessation: Moderating effects of experienced failure to control smoking and plans to quit. *Psychology of Addictive Behaviors, 24*, 670–679. doi:10.1037/a0021722

- Clegg Smith, K., Siebel, C., Pham, L., Cho, J., Friedman Singer, R., Chaloupka, F. J., et al. (2008). News on tobacco and public attitudes toward smokefree air policies in the United States. *Health Policy*, 86, 42–52. doi:10.1016/j.healthpol.2007.09.015
- Cummings, K. M., Sciandra, R., Carol, J., Burgess, S., Tye, J. B., & Flewelling, R. (1991). Approaches directed to the social environment. In D. R. Shopland, D. M. Burns, J. M. Samet, & E. R. Gritz (Eds.), *Strategies to Control Tobacco Use in the United States: A Blueprint for Public Health in the 1990's. Tobacco Control Monograph No. 1* (pp. 203–265), Washington, DC: U.S. Department of Health and Human Services.
- Doucet, J. M., Velicer, W. F., & Laforge, R. G. (2007). Demographic differences in support for smoking policy restrictions. *Addictive Behaviors*, 32, 148–157. doi:10.1016/j.addbeh.2006.04.003
- Evans, W. D., Crankshaw, E., Nimsch, C., Morgan-Lopez, A., Farrelly, M. C., & Allen, J. (2006). Media and secondhand smoke exposure: Results from a national survey. *American Journal of Health Behavior*, 30, 62–71. doi:10.5993/AJHB.30.1.6
- Fichtenberg, C. M., & Glantz, S. A. (2002). Effect of smoke-free workplaces on smoking behaviour: Systematic review. *British Medical Journal*, 325, 188–194. doi:10.1136/bmj.325.7357.188
- Flay, B. R. (1987). Mass media and smoking cessation: A critical review. *American Journal of Public Health*, 77, 153–160. doi:10.2105/AJPH.77.2.153
- Forster, J. L., Widome, R., & Bernat, D. H. (2007). Policy interventions and surveillance as strategies to prevent tobacco use in adolescents and young adults. *American Journal of Preventive Medicine*, 33, S335–S339. doi:10.1016/j.amepre.2007.09.014
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, 74, 1464–1480. doi:10.1037/0022-3514.74.6.1464
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85, 197–216. doi:10.1037/0022-3514.85.2.197
- Hahn, E. J., Rayens, M. K., Butler, K. M., Zhang, M., Durbin, E., & Steinke, D. (2008). Smoke-free air laws and adult smoking prevalence. *Preventive Medicine*, 47, 206–209. doi:10.1016/j.ypmed.2008.04.009
- Hamilton, W. L., Biener, L., & Rodger, C. N. (2005). Who supports tobacco excise taxes? Factors associated with towns' and individuals' support in Massachusetts. *Journal of Public Health Management and Practice*, 11, 333–340.
- Huijding, J., de Jong, P. J., Wiers, R. W., & Verkooyen, K. (2005). Implicit and explicit attitudes toward smoking in a smoking and a nonsmoking setting. *Addictive Behaviors*, 30, 949–961. doi:10.1016/j.addbeh.2004.09.014
- Macy, J. T., Chassin, L., & Presson, C. C. (2011). Smoking behaviors and attitudes during adolescence prospectively predict support for tobacco control policies in adulthood. *Nicotine & Tobacco Research*. Advance online publication. doi:10.1093/ntr/nt301
- Moskowitz, J. M., Lin, Z., & Hudes, E. S. (2000). The impact of workplace smoking ordinances in California on smoking cessation. *American Journal of Public Health*, 90, 757–761. doi:10.2105/AJPH.90.5.757
- Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2005). Understanding and using the Implicit Association Test: II. Method variables and construct validity. *Personality and Social Psychology Bulletin*, 31, 166–180. doi:10.1177/0146167204271418
- Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2006). The Implicit Association Test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Social psychology and the unconscious: The automaticity of higher mental processes* (pp. 265–292), New York: Psychology Press.
- Osypuk, T. L., & Acevedo-Garcia, D. (2010). Support for smoke-free policies: A nationwide analysis of immigrants, US-born, and other demographic groups, 1995–2002. *American Journal of Public Health*, 100, 171–181. doi:10.2105/AJPH.2009.160218
- Poland, B. D., Cohen, J. E., Ashley, M. J., Adlaf, E., Ferrence, R., Pederson, L. L., et al. (2000). Heterogeneity among smokers and non-smokers in attitudes and behaviour regarding smoking and smoking restrictions. *Tobacco Control*, 9, 364–371. doi:10.1136/tc.9.4.364
- Quick, B. L., Bates, B. R., & Romina, S. (2009). Examining antecedents of clean indoor air policy support: Implications for campaigns promoting clean indoor air. *Health Communication*, 24, 50–59. doi:10.1080/10410230802606992
- Rose, J. S., Chassin, L., Presson, C. C., & Sherman, S. J. (1996). Demographic factors in adult smoking status: Mediating and moderating influences. *Psychology of Addictive Behaviors*, 10, 28–37. doi:10.1037//0893-164X.10.1.28
- Schmitt, C., Elek, E., Duke, J., & Watson, K. (2010). *Is the public ready for policy change at the POS? Attitudes toward advertising at the POS and policies to regulate it*. Paper presented at the American Public Health Association Annual Conference, Denver, CO.
- Schumann, A., John, U., Thyrian, J. R., Ulbricht, S., Hapke, U., & Meyer, C. (2006). Attitudes toward smoking policies and tobacco control measures in relation to smoking status and smoking behaviour. *European Journal of Public Health*, 16, 513–519. doi:10.1093/eurpub/ck1048
- Sherman, S. J., Chassin, L., Presson, C., Seo, D.-C., & Macy, J. T. (2009). The intergenerational transmission of implicit and explicit attitudes toward smoking: Predicting adolescent smoking initiation. *Journal of Experimental Social Psychology*, 45, 313–319. doi:10.1016/j.jesp.2008.09.012
- Sherman, S. J., Rose, J. S., Koch, K., Presson, C. C., & Chassin, L. (2003). Implicit and explicit attitudes toward cigarette smoking: The effects of context and motivation. *Journal of Social and Clinical Psychology*, 22, 13–39. doi:10.1521/jsocp.22.1.13.22766
- Swanson, J. E., Rudman, L. A., & Greenwald, A. G. (2001). Using the Implicit Association Test to investigate attitude-behavior

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consistency for stigmatised behaviour. *Cognition and Emotion*, 15, 207–230. doi:10.1080/0269993004200060

Wakefield, M., Flay, B., Nichter, M., & Giovino, G. (2003). Effects of anti-smoking advertising on youth smoking: A review. *Journal of Health Communication*, 8, 229–247. doi:10.1080/10810730305686

Waters, A. J., & Sayette, M. A. (2006). Implicit cognition and tobacco addiction. In R. W. Wiers, & A. W. Stacy (Eds.), *The handbook of implicit cognition and addiction* (pp. 309–338). Thousand Oaks, CA: Sage.

Wiers, R., & Stacy, A. (2006). *Handbook of implicit cognition and addiction*. Thousand Oaks, CA: Sage.