



TRENDS AND APPLICATIONS

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Integrating Negative Social Cues in Tobacco Packaging: A Novel Approach to Discouraging Smokers

Smoking is an international health crisis. Tobacco packaging is an important vehicle to convey antismoking messages, which to date have been predominantly limited to fear-based health appeals. Using an experimental approach, we examine whether a novel alternative—using negative social cues on packaging—is effective at discouraging smoking. Our results support the notion that packaging which conveys to smokers that “others” view smoking negatively is sufficient to trigger feelings of self-consciousness, which in turn reduces smoking intentions. This approach is particularly effective in “isolated” smokers who do not see smoking as identity-relevant or congruent with their social self. These findings suggest that for a particular segment of the smoking population, the integration of negative social cues on packaging may be an effective complement to current fear-based appeals.

Although smoking has declined in developed countries, it remains a major cause of disease, contributing globally to over 7 million deaths annually (Burton et al. 2015; World Health Organization [WHO] 2017). This major public health concern warrants a multipronged strategy incorporating a range of tools and approaches. One such tool is tobacco packaging itself, given its ability to prominently and repeatedly warn smokers of tobacco’s dangers via text and images. The 2005 WHO-led tobacco treaty (“The Framework Convention on Tobacco Control”) recommends at least half of all cigarette packages be covered with graphic pictorial warnings and text (Article 11, Framework Convention Alliance 2017). This recommendation has been adopted by over 100 countries, including Canada, Australia, and much of Western Europe, though legal challenges led by the tobacco industry have thwarted adoption in the United States

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(Bayer, Johns, and Colgrove 2013). Many tobacco researchers advocate for greater use of graphic warning labels, arguing these are more effective than text-only labels (Hammond et al. 2006; Huang, Chaloupka, and Fong 2014; Noar et al. 2016). Given the importance of tobacco-package warnings, researchers continue to explore new opportunities for effective packaging within the frameworks and constraints of individual country law.

Broadly speaking, packaging-based research has at its foundation an assumption that images and text should disseminate health-based messages, generating fear as the main deterrent. Tobacco packages thus feature images related to, for example, rotting teeth, cancer, and sudden infant death. This approach makes sense, given that increasingly graphic photos evoke in smokers greater fear which, in turn, increases anti-smoking behaviors (Andrews et al. 2014; Hammond 2011; Kees et al. 2010). However, while anti-smoking campaigns more generally have used a wide variety of other arguments to supplement fear-appeals—its financial cost, negative impact on physical attractiveness, and so forth—incorporating messaging highlighting the social drawbacks to smoking onto tobacco packaging itself is rarely done outside of academic research, much of which has focused specifically on the youth smoking segment (e.g., Hoek, Hoek-Sims, and Gendall 2013; Michaelidou, Dibb, and Ali 2008). Given that diversifying tobacco packaging messages may help appeal to a broader range of smoker segments (Strahan et al. 2002), here we explore how using social cues of disapproval affect quitting intentions in an adult smoking population.

BACKGROUND AND HYPOTHESES

Smoking, Social Norms, and Cues

All societies possess social norms dictating what behaviors and activities are deemed acceptable (Schultz et al. 2007). Social norms are not necessarily consistent with laws (e.g., speeding); instead, people adhere to them given the perceived rewards associated with compliance and the perceived punishments associated with noncompliance (Cialdini, Reno, and Kallgren 1990). Public health campaigns warning against second-hand smoke exposure and public smoking bans have shifted societal perspectives toward nonsmoking as the normative behavior. As a result, smoking has become an increasingly unacceptable practice in much of the Western world (Bayer 2008; Kim and Shanahan 2003). This shift has been credited with helping reduce smoking prevalence (Alamar and Glantz 2006; Burton et al. 2015; Fichtenberg and Glantz 2002).

Social cues can be used to demonstrate a norms violation. Facial expressions and other nonverbal communications can help the receiver decode a situation and guide a response (Laplante and Ambady 2002). For example, simply adding either a smiley or frowning face emoticon when providing consumers with feedback on their energy usage rates—a technique adopted to convey social (dis)approval—significantly increases energy conservation (Schultz et al. 2007). It appears that both positive and negative social cues can motivate compliance with some desirable outcome.

Social Cues and Self-Conscious Emotions

Research by Schultz et al. (2007) demonstrates that negative social cues can motivate positive change in the recipient of that social cue. Although that research did not speculate on the mediating mechanism, we believe negative social cues are effective because they cause the target of this cue to feel negative self-conscious emotions (e.g., guilt, shame, embarrassment; Lewis 2008). People can report feeling guilty not only when they have committed a “wrong” against an individual, but also when they have violated societal norms and standards (Dahl, Honea, and Manchanda 2003). Experiencing a negative self-conscious emotion such as guilt, in turn, drives an individual to engage in reparative behaviors (Brennan and Binney 2010; Passyn and Sujun 2006). When people feel that they have done something wrong, most are motivated to make amends, often by ceasing to engage in the offending behavior, apologize for the wrongdoing, or avoid the situation entirely (Lewis 2008). Thus, violating a social norm and subsequently receiving negative feedback via social cues should generate negative self-consciousness, in turn motivating the individual to change his behavior to make amends.

Given the current “anti-smoking” climate that exists in many countries (e.g., United States), smokers are aware that their habit is stigmatized and considered a norms violation (Bell et al. 2010; Graham 2012). Communities where smoking is socially unacceptable report lower smoking rates, with resident smokers reporting higher motivation to quit (Alamar and Glantz 2006; Kim and Shanahan 2003). Environmental and social conditions that reinforce the social desirability of nonsmoking, such as being around nonsmoking friends and family, likewise deter smoking behaviors, and smokers may go as far as to hide ashtrays in their homes when nonsmoking friends are invited over (Burton et al. 2015). It appears then that smoking can generate a degree of self-consciousness, especially when in the presence of nonsmokers.

Although current packaging approaches do not overtly incorporate social cues, some subtly touch on negative social consequences of smoking (e.g., erectile dysfunction, dangers to nonsmoking bystanders). Given these packages indirectly speak to potential “other-related” suffering due to a smoker’s actions, they likely elicit some degree of self-consciousness (Agrawal and Duhachek 2010). Here, we adopt a more direct approach to conveying social disapproval, incorporating images of disapproving “others” intended to remind smokers that they are violating a social norm. Given that images highlighting a person’s disapproval of another’s behavior can evoke self-conscious emotions (Giner-Sorolla and Espinosa 2011), as can the awareness of a norms violation (Dahl, Honea, and Manchanda 2003), we predict that incorporating negative social cues should generate self-consciousness in smokers. Since individuals dislike experiencing negative self-conscious emotions such as shame, guilt, and embarrassment, smokers exposed to this packaging should thus actively work to avoid or undo this feeling, by abstaining from or reducing consumption:

H1: Negative social cues on tobacco packaging will increase smoking cessation intentions in smokers, mediated by an increase in negative self-conscious emotions.

Individuals behave in ways they anticipate will be well-received by their social circle (Leary and Kowalski 1990). For some smokers, self-presentational motives are an important driver (Leary, Tchividjian, and Kraxberger 1994), suggesting they choose to smoke in part because of perceived positive feedback from others. For example, they may feel that smoking makes them look cool or helps them stand out (Norman and Tedeschi 1989). These so-called others do not need to be members of someone’s actual reference group to impact behavior; in fact, perceiving that aspirational others smoke appears particularly effective at prompting youth to start smoking (Pezzuti, Pirouz, and Pechmann 2015).

While social cues should affect smoking intentions, they are unlikely to work equally across all segments. Instead, social cues should be particularly effective with those smokers already sensitive to tobacco denormalization but ineffective with smokers who are not. For example, some smokers view their habit as socially acceptable because many in their peer group are smokers too (Bell et al. 2010), creating a type of insulated bubble against a broad societal antismoking backlash. If a person’s friends, co-workers, and romantic partners are also smokers, negative social cues suggesting that some abstract “societal others” disapprove of the behavior is likely to seem irrelevant. Instead, in such people, smoking may even

help strengthen relationships, indicate conformity with in-group norms, and allow them to “fit” with a desired image. In this group, which we refer to as “immersive smokers,” tobacco use is an acceptable part of their social identity and social cues on packaging should do little to discourage smoking.¹

Conversely, negative social cues on tobacco packaging should be particularly effective in “isolated smokers” for whom smoking may represent merely a guilty pleasure or tobacco addiction. These smokers are acutely aware of the stigma associated with the behavior and are likely to dissociate their smoking behaviors with their overall social self-identity. They are unlikely to have a peer group comprised of smokers, instead smoking privately. These isolated smokers are embedded in communities with lower acceptance of smoking and may already be motivated to quit (Kim and Shanahan 2003). As a result, tobacco packaging communicating a parallel message should help strengthen their resolve:

H2: The effectiveness of negative social cues on self-conscious emotions will be moderated by the degree to which individuals associate smoking with their social self-identity; for individuals with a low (high) social self-identity tied to smoking, social cues will be relatively more (less) effective at encouraging smoking cessation.

STUDY DESIGN AND METHODOLOGY

Design

We conducted an online experiment with a paid Qualtrics panel of American adult smokers ($n = 156$; 53% male; $M_{\text{age}} = 49$ years, $SD = 11.39$; see Appendix A for summary statistics). Because the study’s moderator and dependent measures do not apply to nonsmokers, only participants who self-identified as smokers were included. Participants were randomly assigned to view one of two tobacco packages, which included the same tagline (“this is how people look at smokers”) but portrayed different images. Specifically, packages featured black and white photographs of

1. Smoking categories such as “social,” “moderate,” and “heavy” smokers do not neatly align with either “immersive” or “isolated” smokers, as the former categories relate to smoking *behavior* (the location and frequency of the act itself) whereas the latter speaks to the degree a smoker links the behavior with his social *identity*. Social smokers only smoke around others (Debevec and Diamond 2012), and though smoking may be linked with their social identities clear exceptions come to mind (i.e., adults who smoke with colleagues while on business travel, but otherwise identify as “non-smokers” when at home with family). Similarly, moderate and heavy smokers should vary on the degree to which smoking informs their overall social identity, depending on whether they are part of smoking communities, smoke publicly, and so forth (Bell et al. 2010).

the same three individuals either displaying neutral or disgusted expressions. These pretested images served as our social cue manipulation (see Appendix B for stimuli and Appendix C for pretest details). We selected the Benson & Hedges brand as it is sold in United States but allowed us to easily modify existing Canadian packaging containing the requisite space to display stimuli images and text. Prior to viewing the package, participants were told that they would be shown an image of a potential new tobacco package currently in development and encouraged to examine it carefully so as to answer follow-up questions. Next, participant responses were collected for study variables in the following order: dependent variable, mediator variable, moderator variable, demographics, and manipulation check. To begin, participants were asked to indicate the extent that the package (1) made them want to quit and (2) cut down on smoking (1 = "not at all" and 7 = "extremely"), which we averaged to form one composite dependent variable ($\alpha = .95$). Then we asked six questions assessing how guilty, ashamed, embarrassed, culpable, remorseful, and humiliated the packaging made them feel (1 = "not at all" and 7 = "extremely"), which we averaged into a composite of self-conscious emotions ($\alpha = .96$). Next, participants were asked nine questions assessing the degree to which they used smoking for impression management, again with a 7-point Likert scale (e.g., 1 = "smoking is not part of my style" vs. 7 = "smoking is part of my style" [$\alpha = .75$], see Appendix D). We assessed age, gender, average number of cigarettes smoked per day, and a single-item measure asking participants to indicate their current smoking cessation status (e.g., "I'm not thinking about quitting," "I'm thinking about quitting but not sure I'm ready," "I'm planning on quitting right now," "I'm actively quitting right now," and "I have already quit"; Owen et al. 1992). All four variables are included as covariates in the analyses. Finally, participants rated how disgusted, repulsed, and sickened the individuals on the packaging looked as a manipulation check (0 = not at all, 10 = completely; $\alpha = .89$). All participants were debriefed and provided a list of smoking-cessation resources upon study completion. The study had ethics approval.

Results

The manipulation was successful. Participants shown the negative social cue package rated the faces as more disgusted ($M = 7.45$) than participants shown the neutral social cue package ($M = 4.92$; $F(1, 153) = 36.6$, $p < .001$). Further, compared to participants shown the neutral social cue packaging, those shown the negative social cue packaging reported higher

TABLE 1
MANCOVA Summary

| Condition | Self-Conscious Emotions | | | Quit/Cutdown Composite | | |
|-----------|-------------------------|------|------------|------------------------|------|------------|
| | M | F | <i>p</i> < | M | F | <i>p</i> < |
| Neutral | 1.92 | 7.08 | .01 | 2.32 | 1.71 | .19 |
| Disgusted | 2.54 | | | 2.66 | | |

Note: Covariates include age, gender, smoking cessation readiness, and number of cigarettes smoked per day.

TABLE 2
Mediation Analysis Results

| | Indirect Effect (CI) | Direct Effect (CI) |
|------------------------|-----------------------|--------------------|
| DV: Desire to quit | .23 (.06, .41) | -.04 (-.23, .15) |
| DV: Desire to cut down | .26 (.07, .44) | -.10 (-.32, .11) |
| DV: Composite* | .24 (.07, .42) | -.07 (-.26, .12) |

Note: Process Model 4 with 5,000 draws (mediator = self-conscious emotions); *mean of Quit, Cut Down ($\alpha = .95$); covariates include age, gender, smoking cessation readiness and number of cigarettes smoked per day; a path (**bold**) is significant if CI does not straddle zero.

levels of felt self-consciousness ($M_{\text{neutral}} = 1.92$ vs. $M_{\text{negative}} = 2.54$, $F(1, 153)$, $p = .01$; Table 1). There was no difference between the two groups on overall quit intentions ($M_{\text{neutral}} = 2.32$ vs. $M_{\text{negative}} = 2.66$, $F(1, 153)$, $p = .19$.) suggesting the potential for an indirect effect (Zhao, Lynch Jr, and Chen 2010). To test the hypotheses, we used the PROCESS macro for SPSS (5,000 bootstrapped samples; Hayes 2013).

Our first hypothesis predicted feelings of self-consciousness mediate the effects of social cues (IV) on smoking cessation intentions (DV), which we tested using PROCESS model 4 (i.e., a mediation model; Table 2). The results supported our first hypothesis, demonstrating an indirect effect of social cue on quit intentions mediated by feelings of self-consciousness ($\beta = .24$, 95% CI = 0.07, 0.42), but no direct effect of social cue on intentions ($\beta = -.07$, 95% CI = -0.26, 0.12). As predicted, negative social cues on tobacco packaging increases feelings of self-consciousness in smokers, leading to higher intentions to quit.

We also predicted that certain smokers would be especially sensitive to social cues, namely those isolated smokers who do not use smoking as part of their social identity construction. This hypothesis reflects moderated-mediation, which we tested using PROCESS model 7 (Hayes 2013). The indirect effect of the highest-order interaction through self-conscious emotions was significant (i.e., index of

TABLE 3
Moderated-Mediation Analysis Results

| Moderator | Estimated at: | DV: Desire to Quit | | | DV: Desire to Cut Down | | | DV: Composite | | |
|----------------------------|---------------|-----------------------------|---------------------------------------|---------------------|-----------------------------|---------------------------------------|---------------------|-----------------------------|---------------------------------------|---------------------|
| | | IMM (CI) | Indirect Effect Through Mediator (CI) | Direct Effect (CI) | IMM (CI) | Indirect Effect Through Mediator (CI) | Direct Effect (CI) | IMM (CI) | Indirect Effect Through Mediator (CI) | Direct Effect (CI) |
| Smoking as Social Identity | - 1 SD | -0.25 (-0.44, -0.07) | .47 (0.21, 0.72) | -0.04 (-0.23, 0.15) | -0.28 (-0.49, -0.07) | .51 (0.23, 0.80) | -0.10 (-0.32, 0.11) | -0.27 (-0.47, -0.07) | .49 (0.23, 0.77) | -0.07 (-0.26, 0.12) |
| | + 1 SD | | -0.01 (-0.24, 0.21) | | | -0.01 (-0.26, 0.41) | | | -0.01 (-0.25, 0.22) | |

Note: Process Model 7 with 5,000 draws (mediator = self-conscious emotions); covariates include age, gender smoking cessation readiness, and number of cigarettes smoked per day; a path (**bold**) is significant if CI does not straddle zero; IMM = Index of Moderated Mediation (must not straddle 0 for an interpretation of moderation to be supported). At the request of a reviewer, we also ran three amended moderated-mediation analyses. In two, one item was removed from the moderator. With the item "smoking makes me feel younger" removed, the results were substantively the same: (DV: Composite) IMM = -.27 (CI = -.46, -.08) (-1SD = .50, CI = 0.23, 0.77; +1SD = -0.02, CI = -0.26, 0.20). Similarly, with the item "I smoke publicly" removed, the results were substantively the same: (DV: Composite) IMM = -.22 (-0.42, -0.03) (-1SD = .49, CI = 0.21, 0.78; +1SD = .05, CI = -0.18, 0.27). Finally, we ran a model where both items were removed from the moderator jointly and the results were similar: (DV: Composite) IMM = -.22 (-0.42, -0.03) (-1SD = .48, CI = 0.19, 0.77; +1SD = .04, CI = -0.21, 0.26).

moderated-mediation $\beta = -.27$, 95% CI = $-0.47, -0.07$, Table 3), which indicates significant moderation of the mediated path. When a person's social identity is strongly tied to smoking (+1 SD), there is no indirect effect of using negative social cues ($\beta = -.01$, 95% CI = $-0.25, 0.22$). However, when social identity is weakly tied to smoking (-1 SD), the indirect effect of using negative social cues is positive and significant ($\beta = .49$, 95% CI = $0.23, 0.77$). These results provide support for H₂, demonstrating that whereas immersive smokers are relatively impervious to negative social cues on packaging, isolated smokers are apt to feel self-conscious and adjust smoking intentions accordingly. For this particular smoking segment, negative social cues appear effective at deterring smoking. This analysis also found a nonsignificant direct effect ($\beta = -.07$, 95% CI = $-0.26, 0.12$) and that women were less likely than men to want to quit/cut down ($\beta = -.58$, 95% CI = $-0.95, -0.21$).

DISCUSSION

These results suggest that incorporating negative social cues into tobacco packaging may hold promise as a means of encouraging smokers to quit, and that additional research into techniques outside of the traditional fear-based packaging is warranted. In particular, it seems that social cues resonate with isolated smokers, those already well-aware of the stigma and social liability associated with smoking who likely smoke for nonsocial reasons such as addiction. In contrast, immersive smokers who view the act as an enjoyable, central part of their lifestyle and social network seem relatively unaffected by negative social cues on packaging, much in the same way other denormalization strategies based on social pressure have proved ineffective in this segment (Bell et al. 2010).

Limitations and Extensions

We hope these results encourage others to explore packaging approaches outside traditional fear-appeals. Prior to implementing this technique in practice, follow-up research should contrast the effectiveness of this approach against current packaging. Specifically, studies should determine whether our proposed social cue packaging works as well as the fear-based packaging currently in use, and if so, what combinations of packaging types and smoker segments are maximally effective at discouraging smoking. In addition, this study was conducted online, with behavioral intentions as a proxy for behavior. While this enabled us to tightly control other factors and establish support for our theoretical model, researchers should

replicate our findings in a longitudinal field study to gauge the impact of repeated exposure to social cues on smoking rates, beliefs about smoking, and smoking rates in public or social situations (Burton et al. 2015; Hoek, Hoek-Sims, and Gendall 2013). Additional empirical support in favor of this approach will benefit decision makers, especially given that in some countries (e.g., United States), there is already strong opposition to using graphic images on cigarette packaging (Bayer, Johns, and Colgrove 2013). Indeed, while implementation of any nonhealth messages in packaging may be problematic in America, it may hold promise in countries such as Canada and Australia where graphic packaging is already the norm.

Additionally, it would be worth exploring extensions and additional consequences to social cueing. For example, researchers should investigate whether social cues can act as initial smoking deterrents, especially within the youth population. Many adolescents start out as social or casual smokers who only smoke around their peers (Debevec and Diamond 2012), thus reinforcing the social undesirability of smoking may be particularly promising in this segment as a way of preventing onset. Additionally, graphic pictorial warnings have acted as conversation-starters, causing smokers to reflect with others on the dangers of smoking (Hall et al. 2015). It would be interesting to examine whether negative social cues on packaging also stimulate discussion, and if so, whether peer-to-peer conversations about tobacco stigma amplifies or lessens the effectiveness of this technique, especially in the challenging college student segment (Wolburg 2006).

A final limitation concerns the philosophical debate as to the appropriateness of using negative social cues as a deterrent. While packaging in many countries features rather shocking and disgusting images, the approach espoused by our research question is different. As discussed earlier, the increasing stigmatization of smoking behavior has been credited with reducing overall smoking rates (Bayer 2008; Kim and Shanahan 2003). The effectiveness of using stigma as a deterrent to smoking has thus been argued as a potentially justifiable means (Bayer 2008), and our results suggest that negative social cues could indeed be effective with some smokers. Other researchers, however, have voiced concerns that smoking stigma has disproportionately affected the poor, increasing the barriers they face in accessing necessary health-related treatments and services (Bell et al. 2010). Just because stigmatization works then does not necessarily mean that it is ethically justifiable, and the same could be argued regarding the adoption of negative social cues on packaging. In particular, if negative social cues work via the generation of

self-consciousness in smokers, care must be taken to ensure that those emotions do not simply lead, longer term, to enhanced stress and feelings of dejection in smokers unable to quit. It is important that whatever social cues are incorporated fit with acceptable norms and subject to the same scrutiny and debate as other tobacco denormalization strategies. One alternative approach to that adopted in this research, and perhaps a less controversial one, is to use positive social reinforcement as a means of encouraging smoking cessation (e.g., highlight how happy quitting would make friends and family, an approach advocated for by Strahan et al. 2002 but as yet untested). A study contrasting the effectiveness of positive and negative social cues could help determine whether the approaches are equally effective, and if so, positive social cues may be a more universally acceptable one.

Conclusion

Our research contributes in two meaningful ways. To begin, we extend the existing research on social cueing, demonstrating that its effectiveness is mediated by the generation of self-conscious emotions. We find that negative social cues in the context of a social norms violation trigger feelings of guilt, shame, and embarrassment in the recipient. Thus social cues appear to be effective specifically because they communicate to the target how others feel about them or their actions, and this awareness causes the target to feel self-conscious. It is this self-consciousness that motivates some type of action in the target, as opposed to the social cue directly.

In addition, our research suggests that alternatives to the traditional fear-based packaging techniques are worth considering in the fight against tobacco. In particular, smokers who do not see their smoking behaviors as consistent with their overall social identity appear particularly sensitive to social cues reminding them of the stigma associated with their behavior. Given the devastating effects of smoking, it is important to identify a variety of approaches to discourage smoking. Incorporating negative social cues on tobacco packaging may just be one such tool.

APPENDIX 1: STUDY 1 SAMPLE DESCRIPTION AND SUMMARY STATISTICS

TABLE A1

Sample Characteristics (n = 156; American Qualtrics Panel, Smokers):

| | | |
|-----------|------------------------|-------|
| | M | 49 |
| | SD | 11.39 |
| Age | Min | 22 |
| | Max | 70 |
| Gender | Male | 52.6% |
| | Female | 47.4% |
| Ethnicity | European Descent/White | 80.8% |
| | African-American/Black | 9.6% |
| | Hispanic | 3.8% |
| | Asian | 1.9% |
| | Other | 3.8% |

Note: Respondents reported smoking an average of 15.16 (SD = 8.97) cigarettes/day.

TABLE A2

Summary Statistics

| Variable | M | SD | Min | Max | α | (1) | (2) | (3) | (4) | (5) |
|-------------------------------------|------|------|-----|------|----------|------|------|------|------|-----|
| (1) Self-conscious emotions | 2.26 | 1.57 | 1 | 7 | .96 | — | | | | |
| (2) Desire to quit | 2.40 | 1.78 | 1 | 7 | — | .73 | — | | | |
| (3) Desire to cut down | 2.71 | 1.91 | 1 | 7 | — | .73 | .90 | — | | |
| (4) DV Composite | 2.56 | 1.80 | 1 | 7 | .95 | .75 | .97 | .98 | — | |
| (5) Smoking as social self-identity | 3.78 | .94 | 1 | 5.89 | .75 | -.32 | -.20 | -.24 | -.23 | — |

Note: *all $p < .01$

APPENDIX 2

FIGURE B1

Tobacco package stimuli. Neutral Social Cue and Negative Social Cue

Neutral Social Cue



Negative Social Cue



Note: There were 76 respondents in the neutral condition and 80 in the disgust condition. There were no significant differences in age, gender, smoking cessation readiness, and number of cigarettes smoked per day as a function of these conditions.

APPENDIX 3. PRETEST

Prior to testing our hypotheses, we wanted to ensure that our experimental stimuli conveyed the intended social cues. We selected photographs from a pretested, standardized image bank (Beaupré, Cheung, and Hess 2000) that has successfully been used in other social cueing studies (e.g., Giner-Sorolla and Espinosa 2011). We selected three pictures of different people with a “neutral face,” corresponding to a neutral social cue condition, and three pictures of the same people with a “disgusted face,” corresponding to a negative social cue. We chose disgust because it has been previously demonstrated as effective in generating self-conscious emotions (Giner-Sorolla and Espinosa 2011) and is a common reaction to smoking among nonsmokers (Lader 2009).

We conducted a small pretest with a sample drawn from the same population as our main study. We tested all the images, which contained

a mix of ethnicities and gender. The images were all black and white photographs featuring the same individual with either a neutral or disgusted facial expression against a neutral backdrop. We recruited American adults who self-identified as smokers ($N = 39$, 48.7% male, $M_{\text{age}} = 47$ years) using Qualtrics. Participants were randomly selected to evaluate either all the neutral or negative images and asked to indicate how disgusted each of the three individuals in the photographs seemed (1 = “not at all” and 10 = “extremely”; responses averaged to create a single score for each image set, $\alpha = .77$). We also asked participants to indicate any thoughts or comments they had to ensure the stimuli were not conveying any unintended associations. Participants shown the “disgusted” images rated them as significantly more disgusted ($M = 6.35$) than those shown the “neutral” images ($M = 3.32$; $F(1, 37) = 17.35$, $p < .001$). In addition, no participants provided feedback to suggest the images contained unintended social cues. Thus we carried these images forward to the main study.

Appendix D. Smoking Identity Measures

-
- | | |
|--|---|
| • I smoke publicly | • Most of my friends are smokers |
| • Smoking is part of my style | • Smoking makes me feel good about myself |
| • Smoking reflects who I am | • Smoking makes me look good in front of others |
| • Smoking is an important part of my social life | • Smoking makes me popular |
| • Smoking makes me feel younger | |
-

(adapted from Levinson et al. 2007; Moan and Rise 2006; van den Putte et al. 2009)

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