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Smoke-free air laws and quit attempts: Evidence for a moderating role of spontaneous self-affirmation

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ABSTRACT

Background: In addition to their primary goal of protecting nonsmokers from secondhand smoke, smoke-free air laws may also encourage intentions to quit smoking, quit attempts, and cessation among smokers. However, laws may not encourage quitting if smokers feel threatened by them and react defensively.
Objective: This study examined whether spontaneous self-affirmation – the extent to which people think about their values or strengths when they feel threatened – may reduce smokers' reactance to smoke-free laws, enhancing the ability of the laws to encourage quitting.
Method: We linked state-level information on the comprehensiveness of U.S. smoke-free laws (compiled in January, 2013 by the American Lung Association) with data from a U.S. health survey (Health Information National Trends Survey) collected from September–December, 2013 ($N = 345$ current smokers; 587 former smokers).
Results: Smoke-free laws interacted with self-affirmation to predict quit attempts in the past year and intentions to quit in the next six months: Smokers higher in self-affirmation reported more quit attempts and quit intentions if they lived in states with more comprehensive smoke-free laws. There was some evidence of a "boomerang" effect (i.e., less likelihood of making a quit attempt) among smokers low in self-affirmation if living in states with more comprehensive smoke-free laws, but this effect was significant only among smokers extremely low in self-affirmation. For quit intentions, there was no evidence for a boomerang effect of smoke-free laws even among smokers extremely low in self-affirmation. More comprehensive smoke-free laws were not associated with smoking status (former vs. current smoker) or average amount smoked per day, nor did they interact with self-affirmation to predict these outcomes.
Conclusions: The impact of smoke-free policies on quit attempts and quit intentions may be moderated by psychological characteristics such as the tendency to spontaneously self-affirm. Follow-ups should experimentally manipulate self-affirmation and examine effects of smoke-free laws in controlled contexts.

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1. Introduction

Smoke-free air laws – which ban or restrict smoking in areas such as restaurants, hotels, public transportation, and workplaces – are effective in protecting nonsmokers from secondhand smoke (Callinan et al., 2010; U.S. Department of Health and Human Services, 2006). They may also reduce rates of smoking initiation among youth (Siegel et al., 2008). A secondary benefit of such laws

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is that they may influence the smoking-related attitudes, intentions, and behaviors of smokers. Specifically, smoke-free laws may reduce the social acceptability of smoking, make smoking less convenient, and reinforce the fact that tobacco smoke is harmful to health (Bernat et al., 2010; Rayens et al., 2007). Smoke-free laws thus have the potential to encourage quit attempts, quit intentions, and quit rates among smokers (Fowkes et al., 2008; Hackshaw et al., 2010; Nagelhout et al., 2012).

However, smoke-free laws may not necessarily increase rates of smoking cessation (Hahn et al., 2010). Indeed, a recent systematic review found that "the effect of smoking bans on smoking prevalence was inconclusive," with a trend toward a reduction in prevalence (Callinan et al., 2010, p. 11). The International Tobacco Control (ITC) Conceptual Model proposes that the behavioral effects of tobacco control policies will be moderated by a range of factors such as individuals' psychological characteristics (e.g., stress, time perspective) (Fong et al., 2006). Thus, there is a need for research on psychological factors that may moderate the ability of smoke-free legislation to promote cessation.

Smoke-free laws may not succeed in encouraging quitting if they evoke defensive responses or reactance among smokers. Psychological reactance is a phenomenon whereby externally imposed constraints on a particular behavior can increase people's motivation to engage in the behavior in an attempt to restore feelings of personal freedom (Brehm, 1966). For example, a law raising the legal drinking age may increase alcohol consumption among drinkers who are newly "underage" if they perceive a reduction in their freedom (Allen et al., 1994). Reactance has been documented in response to health warnings against risky behaviors such as alcohol use (Richards and Banas, 2014) and smoking (Freeman et al., 2001; Rhodes et al., 2008). People exhibit greater reactance when they perceive less ability to choose their own actions (Miller et al., 2007). Other defensive reactions such as derogating risk information and downplaying personal vulnerability can also occur in response to communications about health threats (Harris et al., 2007; Erceg-Hurn and Steed, 2011; McQueen et al., 2013; Schüz et al., 2013). It may benefit public health to understand and, if possible, to avoid such "boomerang" effects in the implementation of smoke-free laws.

An important psychological construct that has been shown to reduce defensive reactions to threatening information is self-affirmation. Self-Affirmation Theory (Steele, 1988) holds that individuals seek to maintain perceptions of self-integrity — that is, views of themselves as competent, consistent, and moral individuals. When self-integrity is threatened — e.g., by the suggestion that one's behavior is unhealthy, or by a policy prohibiting the expression of some aspect of one's identity (such as smoking) — people may process the information defensively to protect their self-integrity. For example, in one study, smokers who viewed smoking as an important part of their identity responded more defensively to antismoking videos (Freeman et al., 2001). *Self-affirmation* is a process by which people can bolster their self-integrity by reflecting on their values or strengths, which can allow them to face threats to self-integrity without reacting defensively (Cohen and Sherman, 2014). Self-affirmation has been shown to enhance people's attention to health messages, perceptions of risk, intentions to engage in protective behaviors, and behavior change (Cohen and Sherman, 2014). In the domain of smoking, self-affirmation can reduce defensive responding to warning labels, increase acceptance of anti-smoking messages, and promote quit intentions (Armitage et al., 2008; Harris et al., 2007). Given these effects, it may also mitigate the potential self-threat associated with smoke-free laws.

Self-affirmation can be induced by asking people to reflect on an important value and how they adhere to it in everyday life (McQueen and Klein, 2006). However, people may also spontaneously engage in activities to self-affirm, particularly when experiencing psychological threats (e.g., by writing about life events, viewing social media, or consuming certain goods; Creswell et al., 2007; Sivanathan and Pettit, 2010; Toma and Hancock, 2013; Townsend and Sood, 2012). Indeed, recent studies have assessed individual differences in the tendency to self-affirm when under threat (Harris et al., 2015; Pietersma and Dijkstra, 2012; Taber et al., 2015c), and research shows that self-affirming can offset defensiveness even after a threat has been encountered (Briñol et al., 2007). Spontaneous self-affirmation thus holds promise for reducing defensiveness to potential self-threats from smoke-free policies.

Although no studies to our knowledge have directly tested whether self-affirmation can reduce psychological reactance to policies that restrict certain behaviors, it should be noted that the perception that one is free to make choices is central to self-integrity (Steele, 1988). Self-affirmation may thus reduce the motivation to assert one's freedom in response to restrictions on behavior. Accordingly, self-affirmation may moderate the behavioral effects of smoke-free laws, which directly limit smoking in certain places (Bernat et al., 2010) in addition to implicitly conveying information about the harms and undesirability of smoking (Rayens et al., 2007). The current study assessed this possibility by exploring whether spontaneous self-affirmation moderated the association between smoke-free laws and smoking-related behaviors and intentions (current smoking, quit attempts, quit intentions, and amount smoked). This study will add to the current literature by examining the role of self-affirmation with respect to policy (an association rarely examined previously) using data from a national survey. If self-affirmation moderates the effects of smoke-free laws on smoking behavior, then it may have intervention implications; for example, it may be possible to design affirmation-based interventions to accompany the implementation of smoke-free laws.

2. Methods

2.1. Data sources

Data on smoking behavior, spontaneous self-affirmation, and demographic variables were gathered from the National Cancer Institute's Health Information National Trends Survey (HINTS) 4 Cycle 3. This nationally representative, cross-sectional mail survey assessed cancer information seeking and health behaviors such as smoking, diet, and exercise. HINTS data were collected between September and December of 2013. U.S. households were selected using a random sample of U.S. addresses; within each household, one adult was selected based on proximity of birth date to survey date. A complex sampling design was employed and high minority areas were oversampled. Sample weights were employed to account for the complex sampling design, as well as for household nonresponse, and are used to calculate appropriate standard errors for statistical procedures and to generate nationally representative estimates.

The overall weighted response rate for HINTS 4 Cycle 3 was 35.2%, which is consistent with other mailed surveys (Dillman, 2000). Of the 12,010 households selected to receive a mailing, there were 79 refusals, 7134 nonresponses, and 1612 mailings returned as undeliverable (Westat, 2014). In total, 3185 individuals returned surveys that were either "complete" ($n = 3124$), meaning that at least 80% of required questions had been answered in the first two sections of the survey, or "partially complete" ($n = 61$), meaning that between 50 and 79% of the required questions were answered (Westat, 2014, p. 14). On the variables assessed here, the