



Short Communication

Cue-induced cigarette and food craving: A common effect?

Mindi A. Styn^{a,*}, Dana H. Bovbjerg^b, Samara Lipsky^c, Joel Erbllich^d^a University of Pittsburgh School of Nursing, Department of Health and Community Systems, 3500 Victoria Street, 415 Victoria Building, Pittsburgh, PA, USA^b Biobehavioral Medicine in Oncology Program, University of Pittsburgh Cancer Institute, Departments of Psychiatry, Psychology, Behavioral and Community Health Sciences, University of Pittsburgh, Pittsburgh, PA, USA^c Ferkauf Graduate School of Psychology, Bronx, NY, USA^d Department of Psychology, City University of New York, Hunter College, NY, USA

HIGHLIGHTS

- Self-reported craving for chocolate increases following exposure to chocolate.
- Cue-induced cigarette cravings correlate with elevated cue-induced chocolate cravings.
- This association can be seen without long deprivation periods.
- This relationship may extend to food craving in general.

ARTICLE INFO

Keywords:

Tobacco use disorder
Cigarette cravings
Food cravings
Self-reported cravings
Cue-reactivity
Cue-induced craving

ABSTRACT

Cue-induced cravings may hinder behavior change efforts such as smoking cessation. Correlation of cue-induced cravings across multiple stimuli would provide evidence for a cue-reactive phenotype that may have implications for behavior change therapies. The purpose of this study was to examine relationships between cue-induced cravings for cigarettes and cue-induced cravings for a highly preferred food (chocolate) in a sample of smokers not subjected to lengthy deprivation for either of these two appetitive outcomes. Adult smokers ($N = 164$) were assessed for chocolate cravings before and after exposure to chocolate cues and cigarette cravings before and after exposure to smoking cues. Consistent with previous reports, cigarette cravings increased significantly post-cue exposure and chocolate cravings increased significantly post-cue exposure ($p < .0001$). Consistent with study hypotheses, the magnitude of the increase in chocolate cravings after cue-exposure was significantly related to the increase in post-cue cigarette cravings ($r = 0.38$; $p < .0001$), and was significantly related to scores on a retrospective, self-report, measure of cue-induced food cravings in daily life. These findings are consistent with the idea of a general “cue-reactive” phenotype that varies across individuals, a conceptualization of risk that may point the way toward improved interventions for a variety of hedonically mediated behaviors with negative health outcomes.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

Strong cravings for cigarettes are a common problem for individuals attempting to quit smoking, and high craving intensity predicts low cessation success (Ferguson & Shiffman, 2009; Fidler, Shahab, & West, 2011; Fidler & West, 2011; Waters et al., 2004). In addition to cigarette cravings associated with reductions in circulating nicotine levels, it is increasingly recognized that exposure to cues associated with cigarette smoking can trigger intense cravings, as well as generate changes in physiologic parameters, and activation of reward pathways in the brain that mediate motivated behaviors (Balfour, 2009; Brody et al., 2002; Carter & Tiffany,

1999; Erbllich, Bovbjerg, & Sloan, 2011; Miranda, Rohsenow, Monti, Tidey, & Ray, 2008). Though not undisputed, cue-induced cravings for cigarettes are thought to be a key factor in relapse to smoking even after long periods of abstinence (Ferguson & Shiffman, 2009; Perkins, 2009; Shiffman, 2009). Yet to receive research attention is the possibility that smokers with higher levels of cue-induced craving for cigarettes may also be vulnerable to other cue-induced cravings, such as for highly palatable foods.

A growing body of empirical evidence and recent theorizing supports the view that cue-induced cravings for food and drugs of abuse, including cigarettes, may share the same neurobiological pathways (Blumenthal & Gold, 2010; Kenny, 2011; Pelchat, 2009). Similar to smoking-cue exposure, food-cue exposure elicits intense cravings, as well as generates changes in physiological responses, and activation of brain reward regions involved in motivated behaviors, even among individuals who have recently eaten (Alsene, Li, Chaverneff, & de Wit, 2003; Cornier,

* Corresponding author. Fax: +1 412 383 7293.

E-mail addresses: mimst31@pitt.edu (M.A. Styn), bovbjergdh@upmc.edu (D.H. Bovbjerg), samaralipsky@alum.emory.edu (S. Lipsky), joel.erbllich@hunter.cuny.edu (J. Erbllich).

2009; Ferriday & Brunstrom, 2008, 2011). To date however, only one small study has assessed cue-induced cravings for food and cigarettes in the same individuals, and this study found correlations between the two when participants were under 18 hour selective deprivation (Mahler & de Wit, 2010). Evidence of strong correlations between cue-induced cravings for preferred foods and cigarettes would not only provide behavioral support for shared brain mechanisms, it would also point the way toward an experimental protocol with which to explore common and unique aspects of these conditioned cravings. The results of such research would have implications for optimizing treatment interventions for individuals with a propensity for multiple cue-induced behaviors (a cue-reactive phenotype) that might have negative health implications.

The purpose of this study was to examine relationships between cue-induced cravings for cigarettes and cue-induced cravings for chocolate (one of the most highly craved food items (Polivy, Coleman, & Herman, 2005)) in a sample of smokers in the absence of lengthy concurrent deprivation.

2. Methods

A subgroup of 164 healthy smokers (all participants who completed the food craving assessment which was added to the protocol in mid-recruitment) from a larger study of cue-induced cigarette craving (Erblich & Bovbjerg, 2004) was included in this study. To be eligible for the parent study, participants had to report smoking at least 10 cigarettes per day for at least 5 years and qualify for a current diagnosis of nicotine dependence per the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994). Exclusion criteria were: (1) current treatment for smoking cessation, (2) current or past substance abuse (other than nicotine), (3) history of hospitalization for mental illness, (4) history of smoking-related illness, (5) below the age of 23, and (6) current pregnancy. To be eligible for this sub-study, participants had to complete the parent study and be willing to complete the food craving assessment.

Basic demographic information (age, gender, education, income, ethnicity, marital status) and smoking history data (age at initiation, cigarettes per day, years having smoked) were obtained via self-administered questionnaires. The 6-item Fagerstrom Test of Nicotine Dependence (FTND) was used to measure the severity of participants' dependence on nicotine (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). Finally, participants completed the Situational Appetite Measures—Urges scale (SAM-U) and Efficacy scale (SAM-E). These instruments assess “trait” level of food cue-induced craving in daily life. Each scale has 5 factors with 6 items each related to food cravings in response to specific internal and/or external stimuli: relaxation, presence of food, hunger, reward and negative feelings. Questions asked on the SAM-U and SAM-E are identical and both use a 5-point response scale; however, the SAM-U assesses urge to eat, whereas the SAM-E assesses confidence in resisting the urge to eat. Reliability coefficients for the two factors range from .74 to .95 (Stanton, Garcia, & Green, 1990).

Self-reported craving in response to the experimental cue exposures was assessed via a brief, five-item, 0–100 instrument designed specifically to make rapid assessments of craving during experimental manipulations that has been used in multiple studies (Erblich & Bovbjerg, 2004; Erblich, Boyarsky, Spring, Niaura, & Bovbjerg, 2003; Hutchison, Niaura, & Swift, 1999). Pre- and post-cue versions of the instrument separately assessed cravings for cigarettes and chocolate “right now” and “during the scene,” respectively.

2.1. Procedures

To avoid ceiling effects in cigarette craving, participants were instructed to smoke one cigarette immediately before beginning the study procedures. Participants then turned in their package of cigarettes (used for in vivo exposure; see below) and were given a carbon

monoxide (CO) breath test using a MicroCO monitor (MicroDirect, Lewiston, ME). To be conservative, we explored CO levels as a potential covariate in the analyses (see below).

Following a classic cue-reactivity paradigm, participants were exposed to neutral, food-related, and smoking-related cues. The neutral cue was a stapler, the food cue was a bar of the participant's preferred brand of chocolate, and the smoking cue was a cigarette from the participant's own pack. To avoid possible carryover effects (Sayette, Griffin, & Sayers, 2010), the neutral cue was always presented first, followed by the chocolate cue and then the smoking cue. Self-reported chocolate and cigarette cravings were assessed immediately before and after each cue exposure using the face-valid craving questionnaire. To reduce the possibility of carryover, participants viewed a brief nature video (Hannan, 1999) between each of the three cue exposures. During each exposure, participants held and sniffed the stimulus for 90 s.

2.2. Data analysis

To measure reactivity, we calculated raw pre- and post-change scores on the craving scale for each of the three exposures (neutral, chocolate, cigarette). To control for initial levels, we always analyzed change scores with pre-exposure craving entered as a covariate, yielding indices of baseline-adjusted change (theoretical range = −100 to 100). This approach resolves the frequently discussed problem of poor change score reliability (Pedhazur, 1997). To address the study hypotheses, we conducted partial correlation analyses between: 1) smoking-cue-induced cigarette craving and chocolate-cue-induced chocolate cravings, and 2) specific cue-induced cravings and SAM scores. These analyses controlled for demographics, time since last cigarette, CO levels, BMI, FTND, and craving responses to the neutral stimulus. It should be noted that results were comparable with or without partialling out these factors. Finally, we explored the possibility that gender and ethnicity would moderate the relationships between cigarette and food cravings by comparing subgroup correlations with a Fisher's r to Z transformation.

3. Results

Participants had a mean age of 37.3 ± 10.9 years of age. The sample was 49% female, 37% African American, 29% Caucasian, and 25% Hispanic and smoked an average of 18.0 cigarettes per day (FTND = 5.4). Mean BMI was 27.6 ± 7.0 . Mean time since last cigarette was 32.1 ± 4.2 min. Annual household incomes were less than \$20,000 per year for 40% of the participants, and 70% had completed at least some college.

Mean craving scores are shown in Table 1. As shown in Fig 1, the participants' cigarette cravings increased significantly post-smoking cue exposure ($p < .0001$). Similarly, participants' chocolate cravings increased significantly post-chocolate cue exposure ($p < .0001$). Consistent with the study hypothesis, there was a significant correlation between smoking-cue-induced cigarette craving and chocolate-cue-induced chocolate craving; ($r = 0.38$; $p < .0001$). To better illustrate this relationship, we performed a two-group median split on cigarette craving scores and compared chocolate craving scores between the two groups. As depicted in Fig. 2, smokers with above-median scores in smoking cue-induced cigarette cravings had significantly higher chocolate cue-induced chocolate cravings under laboratory conditions.

We also examined the relationship between laboratory cue-induced cravings and SAM scores (i.e., measures of “real world” cue-induced food urges). Findings revealed that laboratory cigarette craving responses were significantly correlated with both the SAM-E and SAM-U ($r_s = 0.22$, $p_s < .005$). As expected, experimentally-induced cue-induced chocolate cravings were also associated with elevated SAM-E ($r = 0.20$, $p < .01$) and SAM-U ($r = 0.22$, $p < .005$) scores. Separate analyses by gender and ethnicity yielded statistically comparable correlations using Fisher's r to Z transformation ($p_s > .3$), suggesting that effects were not moderated by gender or ethnicity. Finally, demographic factors, BMI, FTND, time

Download English Version:

<https://daneshyari.com/en/article/10443367>

Download Persian Version:

<https://daneshyari.com/article/10443367>

[Daneshyari.com](https://daneshyari.com)