

Introspective responses to cues and motivation to reduce cigarette smoking influence state and  
behavioral responses to cue exposure

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### **Abstract**

In the current study, we aimed to extend smoking cue-reactivity research by evaluating delay discounting as an outcome of cigarette cue exposure. We also separated introspection in response to cues (e.g., self-reporting craving and affect) from cue exposure alone, to determine if introspection changes behavioral responses to cigarette cues. Finally, we included measures of quit motivation and resistance to smoking to assess motivational influences on cue exposure. Smokers were invited to participate in an online cue-reactivity study. Participants were randomly assigned to view smoking images or neutral images, and were randomized to respond to cues with either craving and affect questions (e.g., introspection) or filler questions. Following cue exposure, participants completed a delay discounting task and then reported state affect, craving, and resistance to smoking, as well as an assessment of quit motivation. We found that after controlling for trait impulsivity, participants who introspected on craving and affect showed higher delay discounting, irrespective of cue type, but we found no effect of response condition on subsequent craving (e.g., craving reactivity). We also found that motivation to quit interacted with experimental conditions to predict state craving and state resistance to smoking. Although asking about craving during cue exposure did not increase later craving, it resulted in greater delaying of discounted rewards. Overall, our findings suggest the need to further assess the implications of introspection and motivation on behavioral outcomes of cue exposure.

**Keywords:** Cue exposure; Cue-reactivity; Craving; Delay Discounting; Quit motivation

## Craving questions and motivation to reduce smoking: Variables influencing outcomes of cue exposure

Commonly known as “cue-reactivity” or “cue-provoked craving,” significant research demonstrates the phenomena of cues increasing self-reported craving across drugs of abuse, including nicotine cigarettes (Carter & Tiffany, 1999). However, recent critiques of the cue-reactivity literature (Perkins, 2009, 2012; Veilleux & Skinner, 2015; Wray, Gass, & Tiffany, 2014) highlight three places where additional cue-reactivity research is warranted: (a) expanding the assessment of behaviors evaluated as potential outcomes of cue exposure beyond smoking-related outcomes, (b) understanding how craving responses to cues might differentially affect behavior compared to cue exposure alone, and (c) examination of motivational factors such as desire to quit smoking in the context of cue exposure paradigms.

### **Expanding Behavioral Outcomes**

Although studying the effects of cigarette cues on smoking-related behavior (e.g., latency to smoke, smoking topography, and lapse) is essential, it is also important to examine the effect of cigarette cues on other salient behaviors (Veilleux & Skinner, 2015). Behaviors indicative of self-control are useful targets, as managing the heightened emotion and craving associated with cue exposure may deplete subsequent self-control resources (Muraven & Baumeister, 2000), making impulsive responding more likely. Thus far several studies have found that compared to neutral cues, alcohol cues (Gauget al., 2010; Jones & Field, 2015; Muraven & Shmueli, 2006) and smoking cues (Hagger et al., 2013) are associated with behavior indicative of decreased self-control such as impaired inhibition of learned responses and decreased effort on a physical handgrip task. Expanding the behavioral outcomes assessed as a consequence of cue exposure to include other instances of impulsive responding would add credence to the idea that

cues can deplete self-control resources. In particular, one domain of self-control tasks that have yet to be evaluated as outcomes of cue exposure are delay of gratification tasks, which include delay discounting (Duckworth & Kern, 2011), an index of impulsive responding that is known to be associated with cigarette smoking and other drugs of abuse (Reynolds, 2006).

### **Cue Exposure Versus Response to Cue Exposure**

Cigarette smoking cue-reactivity paradigms typically involve comparing exposure to a smoking cue to some sort of neutral or control cue (e.g., a pencil). Simple cue exposure designs directly compare the cue conditions on behavior, such as studies that found people had impaired Stroop performance after a cigarette cue compared to a neutral cue (Field, Rush, Cole, & Goudie, 2007). Other designs add an assessment of response to cues following cue exposure (e.g., self-reported craving, physiological arousal, brain activity) prior to the central behavioral outcome (see Veilleux & Skinner, 2015 for review). For example, one study found that smoking urge measured after cigarette cue exposure predicted greater alcohol consumption (Palfai, Monti, Ostafin, & Hutchison, 2000).

The distinction between these two types of designs is particularly relevant when using self-report (e.g., craving, emotion) responses to cues, a process that involves introspection or “looking inward” (Sedikides, Horton, & Gregg, 2007, pp. 785). Introspection requires conscious self-reflection in response to the cue, as a person must ask themselves “How much am I craving a cigarette right now?” or “How bad do I feel when looking at this cigarette?” This is likely qualitatively different than experiencing the cue (e.g., viewing a visual cue, holding an unlit cigarette) without an introspective prompt. Simple cue exposure *may* involve introspection, such as a person seeing a visual cigarette cue and thinking to themselves, “I’d really like a cigarette right now!” but may also exert a less conscious effect, consistent with the automatic processing

side of dual process models of craving (Baker, Brandon, & Chassin, 2004; Tiffany, 1990) and self-regulation (Hofmann & Van Dillen, 2012). Theoretically, prominent models of affective adaptation (Wilson & Gilbert, 2008) and the feelings-as-information effect (Schwarz & Clore, 2003, 1983) indirectly support the idea that introspection on craving could decrease or mitigate any effect of cues on self-control failure or impulsive behavior. Attention to feelings may help people “explain” their current state, such that mood (or craving, in this case) would then exert less influence on risk taking, consistent with research indicating that labeling or reporting on current emotions lowers emotional reactivity (Kassam & Berry-Mendes, 2013; Lieberman et al., 2007). Alternately, introspection may involve self-focused attention on craving (and/or associated emotional states) which could enhance craving and disrupt cognitive processes, resulting in worse self-control (Kavanagh, Andrade, & May, 2005). Thusfar, extant evidence comparing simple cue exposure to introspection response to cues is limited; we were unable to find any studies that included a cue exposure paradigm where some people were asked to report on their craving experience (e.g., craving introspection) and where other people were not (e.g., cue exposure alone).

### **Motivation and Resistance**

People motivated to quit smoking report less craving (Wertz & Sayette, 2001) and in some studies show different responses to cues compared to people who do not indicate quit interest (Dempsey, Cohen, Hobson, & Randall, 2007; McDermut & Haaga, 1998), though quit interest is rarely included in studies with behavioral outcomes (for one exception, see Conklin, Parzynski, Salkeld, Perkins, & Fonte, 2012). Motivation matters because it is one mechanism by which mental goal conflict emerges; the conflict between approaching a temptation and avoiding a temptation in service of a long term health goal (Breiner, Stritske, & Lang, 1999; Hofmann,

Baumeister, Förster, & Vohs, 2012). Per the ambivalence model of craving (Breiner et al., 1999), cues may elicit craving *and* avoidance motivation or resistance to smoking, and people more interested in quitting are likely to experience greater resistance to cues (Schlauch, Rice, Connors, & Lang, 2015). Inclusion of quit interest and self-reported resistance to cues in cue-reactivity research is likely important to understand the motivations that influence smokers' decisions in cued contexts.

### **The Current Study**

The current study was designed to extend cue-reactivity research in the three areas described above. We hoped to extend prior work (Hagger et al., 2013) showing that smoking cues deplete subsequent self-control, but using different cues and a different index of impulsive behavior indicative of impaired self-control (e.g., delay discounting). Second, we predicted that introspection in response to smoking cues would decrease the effect of cue on subsequent behavior compared to cue exposure alone. Third, we expected that higher motivation to quit would be associated with decreased craving and increased resistance to smoking in response to cues. We likewise wanted to examine whether quit motivation influenced reactions to cues by way of changes in self-control; we had no clear *a priori* predictions about how quit motivation would moderate the other results.

## **Method**

### **Participants**

Participants were recruited from a pool of 1128 adults who completed an hour long battery of measures assessing emotion, personality (e.g., impulsivity) and risk behaviors (smoking, alcohol, eating pathology, suicide/self-injury history) for \$3 via Amazon Mechanical Turk. Mechanical Turk (mTurk) is a crowdsourced online labor market (Chandler & Shapiro,

2016) frequently used for behavioral research (Gosling & Mason, 2015) including research focused on clinical samples (Shapiro, Chandler, & Mueller, 2013). MTurk participants are roughly comparable to convenience samples obtained from more traditional sources (Bartneck, Duenser, Moltchanova, & Zawieska, 2015; Chandler & Shapiro, 2016; Gosling & Mason, 2015). For the screening battery, participants were restricted to residing in the United States and were required to have a 90% “quality” rating through the mTurk service (i.e., successfully completed 90% of previous “work” on the website).

From the initial pool, participants who reported smoking 10 or more cigarettes per day ( $n = 195$ ; 17% of initial pool) were emailed an invitation to the current study (Shapiro et al., 2013). A total of 90 participants (8% of the initial pool, 46% of those invited) completed the current study, on average 153.1 days ( $SD = 58.65$ ) after the initial measures, but only 3.84 days ( $SD = 4.08$ ) after study invitation. We excluded participants who no longer smoked at least 10 cigarettes a day ( $n = 9$ ). We also excluded participants who reported smoking during the study ( $n = 8$ ), because we could not rule out the possibility that these participants may have smoked partially in response to the study stimuli. Our final sample included 73 people, 56.9% female, 86.3% Caucasian, 37.0% married, mean age 39.71 (range 21 to 67). On average, the sample reported smoking 16.45 cigarettes per day ( $SD = 5.64$ ). We can assume these are primarily non-deprived smokers, as 65.7% indicated smoking within the half an hour prior to the study, and 93% indicated smoking within 2 hours of beginning the study.

## Measures

*Difficulties with Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) is a 36-item measure that assess problems successfully regulating emotions, given on a 5-point Likert scale from 1 (*Almost Never*) to 5 (*Almost Always*). There are six subscales of the DERS: non-

acceptance of emotions, problems with emotional clarity, problems achieving goal-directed behavior, limited strategies for emotion regulation, lack of emotional awareness, and problems with impulsivity. The DERS was given during the initial set of measures, and only the Impulsivity subscale ( $\alpha = .91$ ) was included in the current analysis due to prior work showing a relationship between trait impulsivity, delay discounting and smoking (De Wit, 2009).

*Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonigan, 1996)* is a 19-item scale assessing motivation to change, adapted from the original drinking measure to focus on smoking (Park et al., 2012). Items are rated on a 5-point Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The SOCRATES has three subscales which assess (1) recognition of a problem, (2) ambivalence, and (3) taking steps. For the current study, we used only the Taking Steps subscale ( $\alpha = .94$ ), as questions address active efforts toward behavior change (e.g., “I have already started making some changes in my smoking”) and thus serves as the best indicator of quit motivation.

*Kirby Monetary Choice Task* (Kirby, Petry, & Bickel, 1999) is a 27-item measure of hypothetical delay discounting, where participants are asked to choose between smaller, immediate monetary rewards and larger, delayed rewards (e.g., “Would you prefer \$53 today or \$85 in 7 days?”) Scores are tabulated according to published convention (Kirby et al., 1999), where larger values are associated with greater discounting of delayed rewards, indicative of lower self-control. Prior research has found no differences between hypothetical or real reward discounting ratings (Johnson & Bickel, 2002; Madden et al., 2004), suggesting that the task is an adequate indicator of discounting processes.

## **Procedure**



After consenting to participate in the study, participants were randomized to a 2 (cue condition: neutral or cigarette) x 2 (introspection condition: craving/affect or control) between subjects factorial design. All presentation of materials took place online via Qualtrics, which also allowed for randomization of participants to conditions. Participants in the neutral cue condition viewed 30 pictures from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008). Participants in the smoking cue condition viewed 10 of the neutral IAPS pictures seen by the neutral condition and 20 smoking-related images taken from the Geneva Smoking Pictures set (Khazaal, Zullino, & Billieux, 2012). Smoking cue participants were shown neutral cues to provide a more conservative cue exposure experience. Participants in the neutral cue condition saw *only* neutral images and no smoking images, whereas participants in the smoking cue condition saw primarily smoking images with some neutral pictures. All images were presented in random order.

In addition to the cue manipulation, participants were also randomized to response condition. In the introspection condition, participants were asked to rate each picture on “How positive does this image make you feel?”; “How negative does this image make you feel?”; “After viewing this image, how strong is your craving to smoke?” and “After viewing this image, how much do you want to resist smoking?” on 0 (*not at all*) to 100 (*extremely*) visual analogue scales. In the control (artistry) condition, participants were asked to rate each picture on four sham “art” questions, all given on the same 0 to 100 scale: “How artistic is this image?”; “How memorable is this image?”; “How talented is the artist who took this image?; and “Rate the vividness of the colors in this image.” Thus, the control condition participants responded to questions about the images but were not prompted to introspect on emotion or craving processes.

Following the image ratings, participants completed the Kirby Monetary Choice Task (Kirby et al., 1999) to assess delay discounting. After the Kirby, all participants provided state affect and craving via responses to questions about current momentary positive affect, negative affect, craving and desire to resist smoking on 0 to 100 visual analogue scales. Finally, participants completed the SOCRATES and were asked to re-report their smoking characteristics (e.g. cigarettes smoked per day) as well as whether they acknowledged smoking during the course of the study.

## **Results**

### **Manipulation Checks**

We first examined demographics and smoking variables to ensure that manipulation to condition was successful, and found no effects of cue condition or response condition on any demographic or smoking variable. We then analyzed average craving and affect scores during image presentation for individuals in the introspection condition, to confirm that the smoking images elicited craving compared to the control cue condition. Using between subjects *t*-tests, we found that the cigarette cues were rated with higher negative affect and higher craving than the neutral cues (see Table 1). To provide complete information about the study, and to evaluate the utility of the sham “art” responses, we also conducted between subjects *t*-tests comparing responses on the artistry questions for the participants in the cigarette cue versus the neutral cue conditions (also in Table 1). We found that the cigarette cues were rated as less artistic and as the result of a less talented artist than the neutral images.

### **Correlations**

Zero-order correlations between all study variables are reported in Table 2. Delay discounting scores were not associated with any of the state variables, but greater delay

discounting was positively correlated with greater problems with impulsivity. Craving was associated with greater negative affect and more problems with impulsivity, and negatively correlated with desire to resist smoking. In terms of motivation to change, taking steps toward change was associated with lower craving and higher desire to resist smoking, whereas ambivalence toward change was also associated with desire to resist smoking as well as greater impulsivity.

### **Delay Discounting**

Due to the positive correlation between DERS Impulsivity and delay discounting, impulsivity was used as a covariate in this analysis. A 2 (cue condition) x 2 (introspection condition) ANCOVA revealed no main effect of cue nor a significant cue by introspection interaction (both  $F$ s below 1), but a significant main effect of response condition,  $F(1, 68) = 5.18, p = .03, \eta_p^2 = .07$ . Participants in the introspection condition, who rated the images with craving and affect questions, discounted to a higher degree ( $M = .05, SD = .05$ ) than participants who rated the images with artistry questions ( $M = .03, SD = .03$ ).

### **State Variables**

For all four state variables (negative affect, positive affect, craving, and resistance) measured at the end of the study, we ran 2 (cue) x 2 (response) between subjects ANOVAs. In addition, we added DERS Impulsivity as a covariate to the craving analysis due to significant zero-order correlations. None of the main effects or interactions were significant.

### **Role of Motivation**

We evaluated the effect of quit motivation on delay discounting, state craving and state resistance by conducting three-way moderation analyses using the PROCESS macro in SPSS (Hayes, 2012). In all models, SOCRATES Taking Steps was the focal predictor with the two

experimental conditions (cue condition and introspection condition) as moderators. To be consistent with previous analyses, we likewise added DERS Impulsivity as a covariate to delay discounting and state craving analyses. We found no effect of quit motivation on delay discounting (main effect of introspection condition already described above).

We found a significant three-way interaction predicting state craving,  $B = 3.24$ ,  $SE = 1.59$ ,  $t(64) = 2.03$ ,  $p = .04$ . As is depicted in Figure 1, quit motivation was negatively associated with craving for all groups except for people who saw neutral cues and rated them with art responses (e.g., the true control condition). Essentially, quit motivation was associated with lower craving for people who interacted with some kind of smoking reminder, whether via introspection or visual cues.

When predicting state resistance, the three-way interaction was only marginally significant,  $B = -2.76$ ,  $SE = 1.59$ ,  $t(64) = -1.85$ ,  $p = .07$ , but we found a two-way interaction between quit motivation and cue condition,  $B = 1.60$ ,  $SE = .74$ ,  $t(64) = 2.15$ ,  $p = .03$ . Greater quit motivation was associated with greater desire to resist smoking for people who saw the cigarette cue, compared to people who saw the neutral cue (see Figure 2).

### **Discussion**

Contrary to predictions, we did not replicate prior findings that exposure to smoking cues depleted subsequent self-control (Hagger et al., 2013). Prior studies used *in vivo* cues and cognitive and/or physical self-control tasks (Hagger et al., 2013; Muraven & Shmueli, 2006), whereas we used visual cues along with an impulsivity-based choice task, delay discounting. It is possible that the image cues were not sufficiently strong enough to disrupt self-regulation. Alternatively, it may be that perseverance tasks or set-shifting tasks indicative of inhibition operate differently than tasks addressing impulsive approaches to reward (Duckworth & Kern, 2011). That is, even though

both impulsive and control processes influence self-regulation failure (Heatherton & Wagner, 2011; Hofmann, Friese, & Strack, 2009), perhaps cue exposure disrupts inhibitory processes more generally and heightens impulsive approach toward the cued reward (e.g., smoking) but not impulsive approach toward any reward (e.g., money). These questions are ripe for future research. In addition, our study had a relatively small sample and was conducted online, which was likely associated with decreased experimental control, although studies have found that mTurk workers are relatively comparable to typical non-probability volunteer samples (see Chandler & Shapiro, 2016 for review). Further work is needed to replicate the effect of smoking cues on subsequent self-control, to evaluate if cue type (visual, *in vivo*) and self-control outcomes (e.g., inhibition based, impulsivity based) are generalizable or more narrow in scope.

In terms of introspection to craving and affect, the current study had several interesting findings. First, we found that introspection was associated with greater discounting of delayed rewards compared to people who were asked sham art questions. We note that the introspection effect was not specific to cigarette cues, but independent of cue type, suggesting that repeated attention to craving and affect may disrupt self-control subtly, and is not attributable to increases in self-reported craving. Moreover, the shifts in delay discounting based on introspection counters the notion that delay discounting is a stable trait (Odum, 2011) and are roughly consistent with prior research showing that at least for some people (e.g., people high in extraversion), delay discounting can shift with heightened emotion (Hirsh, Guindon, Morisano, & Peterson, 2010). Here, the implication is that introspection on craving and affect increases desire for immediate reward, a finding that if replicated, may have significant implications for the study of cue-reactivity.

We also found that people who introspected on their craving and affect in response to cues did not report higher craving at the end of the study compared to people in the artistry condition. This finding supports previous research indicating that asking about cigarette craving does not seem to influence later craving (Germeroth & Tiffany, 2015; Heishman, Saha, & Singleton, 2004; Shadel, Niaura, & Abrams, 2001). Moreover, neither cue exposure nor introspection on craving and affect influenced subsequent self-reported positive or negative affect, despite the established connection between cue exposure, craving and affect (Tiffany, 2009). Thus, providing repeated measurements of craving and affect in response to cues does not appear to heighten later craving or emotion, providing greater flexibility in methodology for researchers who wish to actively assess responses to cues.

Finally, motivation to quit, operationalized as taking steps toward reducing use, was significantly related to lower craving and greater resistance to smoking. Moreover, quit motivation interacted with the experimental conditions to predict craving and resistance. Greater motivation to quit smoking was associated with *decreased* craving for participants who were exposed to either cigarette cues *or* questions about craving and affect. Essentially, for people taking more active steps toward reducing use, any type of reminder about smoking prompted lower craving; only for the “true” control condition was quit motivation associated with higher craving. We also found that quit motivation was associated with stronger resistance for people who saw visual cigarette cues. Importantly, this is one of the few studies to intentionally measure *resistance* to smoking. Craving and resistance seem like opposite processes, and we did find a negative association between them. However, the association was small enough to suggest that the processes are least partially independent, and certainly not redundant. These findings underscore the importance of assessing motivation to change behavior, even in studies that are

not focused on cessation. If reminders of smoking prompt greater resistance to smoking or lower craving for people who are taking steps toward quitting, perhaps there are additional implications for treatment. Cue exposure treatment typically tries to extinguish appetitive responses to cues (Conklin & Tiffany, 2002; Unrod et al., 2014), but it may be worth evaluating if smoking cues can be re-conditioned toward health goals, as seems to be the case for these smokers who are actively interested in quitting.

The current study is not without limitations. We had a relatively small sample, where our analyses are likely underpowered; a replication with larger sample sizes would be needed to determine if some effects that were not significant in the current study would reach significance with a larger sample. We recognize that online administration precluded some elements of experimental control; the data we collected did not allow us to control for recency of smoking, we had to exclude 8 people for smoking during the study, and our mTurk participants were faceless and anonymous, all of which would have differed in a laboratory setting. With participants responding to cues online in a non-standard environment—their work or home, most likely—we don't know how either setting or sample influenced the results. That said, as mTurk becomes a more common recruitment tool for internet based psychological research in clinical samples (Chandler & Shapiro, 2016), it will be important to continue to evaluate mTurk alongside laboratory studies to better understand the generalizability of mTurk samples and online procedures.

We also acknowledge that that the response manipulation prompted reflection on multiple processes—both craving/desire *and* basic positive/negative affect. Inclusion of the affect items might have changed the outcome compared to just including craving related items (Schwarz, 1999); future work will want to test the effect of reporting craving on outcomes

without including affect questions to see if there are any additive effects. However, one strength of the study is that we were able to subtly control for liking by use of the sham “art” responses. Indeed, the manipulation check findings that the cigarette slides were rated as less artistic and perceived as stemming from a less talented artist compared to the neutral slides is suggestive of an affect-as-information effect (Schwarz & Clore, 2003), whereby the negative affect and craving induced by the cigarette slides “informed” the artistry ratings.

In conclusion, the current study supports the further exploration of separating cue administration from introspective responses to cues, to determine how they independently relate to both self-reported states (e.g., craving, resistance to smoking, affect) and behavior, including but not limited to general self-control. Moreover, evaluation of attitudes toward quitting or reducing use may be important to model in the context of cue-reactivity, whether assessing state resistance to craving or assessing for intentions and desire to quit. The current study has taken a first step toward filling gaps in cue-reactivity research (Veilleux & Skinner, 2015), toward the future goal of identifying when, for whom and how cues influence smokers’ experience and subsequent behavior.



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Table 1. *Manipulation checks comparing craving/affect responses and artistic ratings for people who viewed cigarette cues versus neutral cues.*

		Cigarette Cues	Unique Neutral Cues	<i>t</i> -test	<i>p</i>
Craving Responses ( <i>n</i> = 38)	Positive Affect	28.18 (22.20)	29.94 (16.50)	.28	.78
	Negative Affect	40.57 (26.30)	22.14 (14.47)	-2.71*	.01
	Craving	45.43 (26.98)	19.87 (19.32)	-3.38**	.002
	Resistance	30.20 (31.20)	20.42 (19.43)	-1.17	.25
Art Responses ( <i>n</i> = 35)	Artistic	24.36 (21.25)	40.71 (11.65)	2.87**	.007
	Memorable	24.63 (21.25)	36.14 (14.56)	1.87	.07
	Talent of Artist	24.28 (21.39)	39.45 (11.83)	2.62*	.01
	Vividness	38.93 (22.45)	38.40 (10.85)	-.08	.93



Table 2. Means (*M*), Standard Deviations (*SD*), and Intercorrelations between study variables.

	1.	2.	3.	4.	5.	6.	7.	Mean (SD)
1. Kirby Delay Discounting	--							.04 (.04)
2. Positive Affect	-.13	--						63.84 (23.92)
3. Negative Affect	-.03	-.68**	--					21.34 (23.41)
4. Craving	.08	-.22+	.34**	--				41.88 (30.03)
5. Resistance	-.16	.19	-.02	-.25*	--			28.63 (29.93)
6. DERS Impulsivity	.36**	-.17	.11	.32*	-.16	--		1.86 (.93)
7. SOCRATES Taking Steps	-.15	.17	-.19	-.25*	.48*	-.10	--	2.83 (1.02)
8. Cigarettes per day	-.004	.05	.06	.03	-.07	.03	-.18	16.45 (5.64)

\* $p < .05$ , \*\* $p < .01$

DERS = Difficulties with Emotion Regulation Scale; SOCRATES = Stage of Change Readiness and Treatment Eagerness scale

Figure 1.

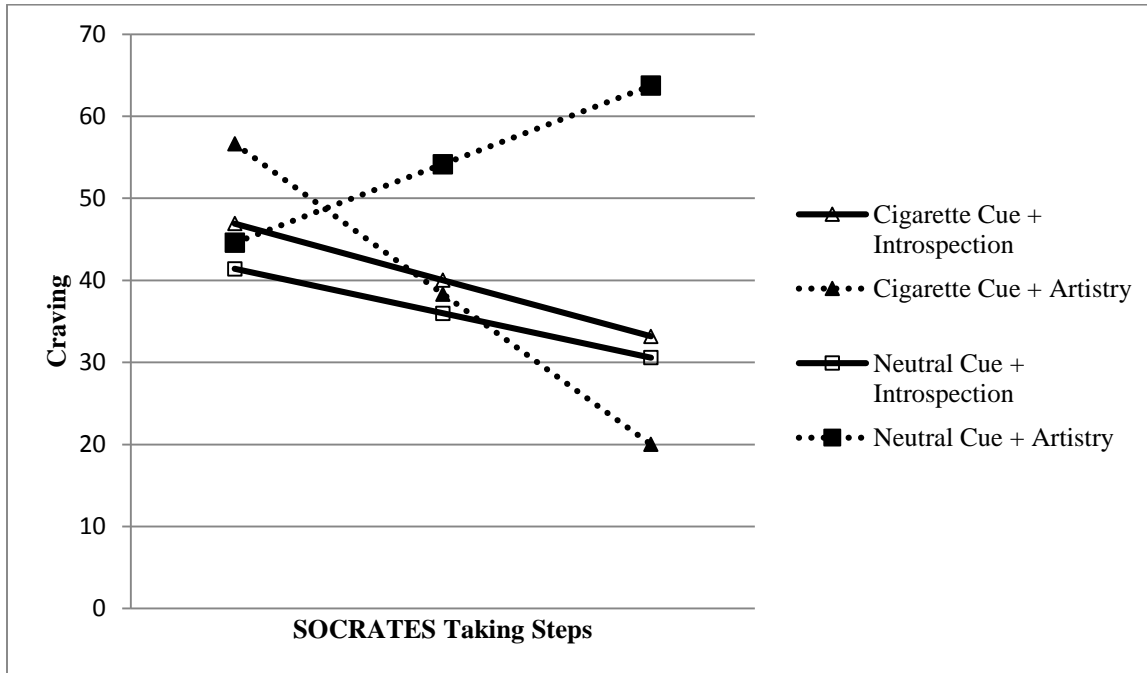


Figure 2

