



## Affect and craving: Positive and negative affect are differentially associated with approach and avoidance inclinations



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### HIGHLIGHTS

- ▶ We examined the effect of negative and positive affect on cue-elicited craving.
- ▶ Negative affect predicted increased approach inclinations for alcohol and cigarettes.
- ▶ Positive affect predicted decreased approach inclinations for alcohol.
- ▶ Positive affect predicted increased avoidance inclinations for alcohol/cigarettes.
- ▶ Findings underscore the utility of a multidimensional conceptualization of craving.

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### ABSTRACT

**Background:** Research on reactivity to alcohol and drug cues has either ignored affective state altogether or has focused rather narrowly on the role of negative affect in craving. Moreover, until recently, the relevant analyses of affect and craving have rarely addressed the ambivalence often associated with craving itself. The current study investigated how both negative and positive affect moderate approach and avoidance inclinations associated with cue-elicited craving in a clinical sample diagnosed with substance use disorders. **Methods:** One hundred forty-four patients (age range of 18–65, mean 42.0;  $n = 92$  males) were recruited from an inpatient detoxification unit for substance abuse. Participants completed a baseline assessment of both positive and negative affect prior to completing a cue-reactivity paradigm for which they provided self-report ratings of inclinations to approach (use) and avoid (not use) alcohol, cigarettes, and non-psychoactive control substances (food and beverages).

**Results:** Participants with elevated negative affect reported significantly higher approach ratings for cigarette and alcohol cues, whereas those high in positive affect showed significantly higher levels of avoidance inclinations for both alcohol and cigarette cues and also significantly lower approach ratings for alcohol cues, all relative to control cues.

**Conclusions:** Results for negative affect are consistent with previous cue reactivity research, whereas results for positive affect are unique and call attention to its clinical potential for attenuating approach inclinations to substance use cues. Further, positive affect was related to *both* approach and avoidance inclinations, underscoring the utility of a multidimensional conceptualization of craving in the analysis.

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### 1. Introduction

With nearly 9% of the U.S. population age 12 or older diagnosable with Substance Use Disorders (SUDs)—most notably alcohol and tobacco use problems (SAMHSA, 2010)—SUDs are undeniably a major public health concern. The high rates of comorbidity of SUDs with anxiety and mood disorders (e.g., Grant et al., 2004) serves to complicate this problem, but also directs attention to the need for a

better understanding of links between affect and compulsive use of popular psychoactive substances (cf. Leshner, 1997). Despite strong links between affect and addictive behaviors, research on reactivity to alcohol and drug cues has typically presented substance use cues only, without regard to the person's affective state or has focused rather narrowly on the role of negative affect in craving. Moreover, until recently, the relevant analyses of affect and craving have rarely addressed the ambivalence often associated with craving itself (see Stritzke, McEvoy, Wheat, Dyer, & French, 2007, for a review). An ambivalence model of craving acknowledges both the desire to consume a substance (approach inclination) and the desire to not consume it (avoidance inclination). By examining the interplay of

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positive and negative affect with the desire to approach and the desire to avoid substance use, the present study sought to further elucidate the links between affect and subjective craving experiences for alcohol and tobacco.

### 1.1. Approach and avoidance as separate dimensions of subjective craving experiences

Theories accounting for substance user's reactivity to drug related stimuli often focus on craving, which has been defined as cue-elicited motivation to consume the substance (e.g., Sayette et al., 2000; Tiffany, 1990; Tiffany & Conklin, 2000). Cue-elicited craving is thought to develop through a process of conditioning, in which drug-related cues are repeatedly paired with positively and /or negatively reinforcing drug effects (e.g., Baker, Piper, McCarthy, Majeskie, & Fiore, 2004; Carter & Tiffany, 1999); however, such conceptualizations fail to account for the ambivalence that substance abusers commonly display toward the drugs they abuse (e.g., Breiner, Stritzke, & Lang, 1999; Stritzke et al., 2007; Tiffany, 1990). For example, ambivalence about use, defined as the simultaneous desire to use and to not use psychoactive substances, has been identified as a hallmark feature of addiction, and is central to many clinical formulations of substance use disorders (e.g., Heather, 1998; Orford, 2001). Further, Tiffany's (1990) cognitive processing model of craving posits that the subjective experience of craving may occur when the immediate gratification of urges to use are impeded by internal motivations to abstain (i.e., abstinence promotion). Despite acknowledgments of the importance of competing desires (Anton, 1999; Kavanagh et al., 2012; Tiffany, 1990), ambivalence is often overlooked in the study of craving.

To address this concern, Breiner et al. (1999) introduced an ambivalence conceptualization of craving (AMC). Consistent with qualitative (e.g., Smith-Hoerter, Stasiewicz, & Bradizza, 2004), quantitative (e.g., Curtin, Barnett, Colby, Rohsenow, & Monti, 2005; Schlauch, Breiner, Stasiewicz, Christensen, & Lang, 2012; Stritzke, Breiner, Curtin, & Lang, 2004), and neurobiological findings (e.g., Barkby, Dickson, Roper, & Field, 2012; Cacioppo, Gardner, & Berntson, 1999), the AMC views craving as a complex experience highlighting the importance of not only craving or desires to use (approach inclinations), but also competing desires to not use (avoidance inclinations). These two dimensions of reactivity are thought to develop through different psychobiological systems following repeated, systematic exposure to reinforcing and punishing events associated with such substance use (Lang, 1995; LeDoux, 2000; Stasiewicz & Maisto, 1993), and are proposed to be orthogonal to one another resulting in four hypothetical quadrants (see Fig. 1 top panel; Breiner et al., 1999; McEvoy, Stritzke, French, Lang, & Ketterman, 2004; Stritzke et al., 2007). Further, while these dimensions may be activated reciprocally (e.g., high on one dimension, low on the other), approach and avoidance inclinations are independent and can be activated simultaneously to elicit different motivational states that vary as a function of drinking and/or recovery status (see Fig. 1 bottom panel).

The addition of a distinct avoidance dimension has numerous advantages clinically and methodologically (see Stritzke et al., 2007 for a review). Further, it has been argued that measuring "craving" or "urge to use" exclusively in terms of approach inclinations without consideration of a separate, yet concurrent, avoidance inclination may misrepresent a motivational disposition that is actually a combination of both, thus significantly diminishing the utility of the information obtained (Breiner et al., 1999). Indeed, studies examining avoidance inclinations using both cue reactivity paradigms and self-report measures have provided support for its incremental validity in predicting substance-related variables in both non-clinical and clinical samples. For example, approach and avoidance can be independently measured as separate dimensions of cue reactivity (e.g. Curtin et al., 2005; Schlauch, Breiner et al., 2012; Stritzke et al., 2004). Further, avoidance has been shown to moderate the effect of

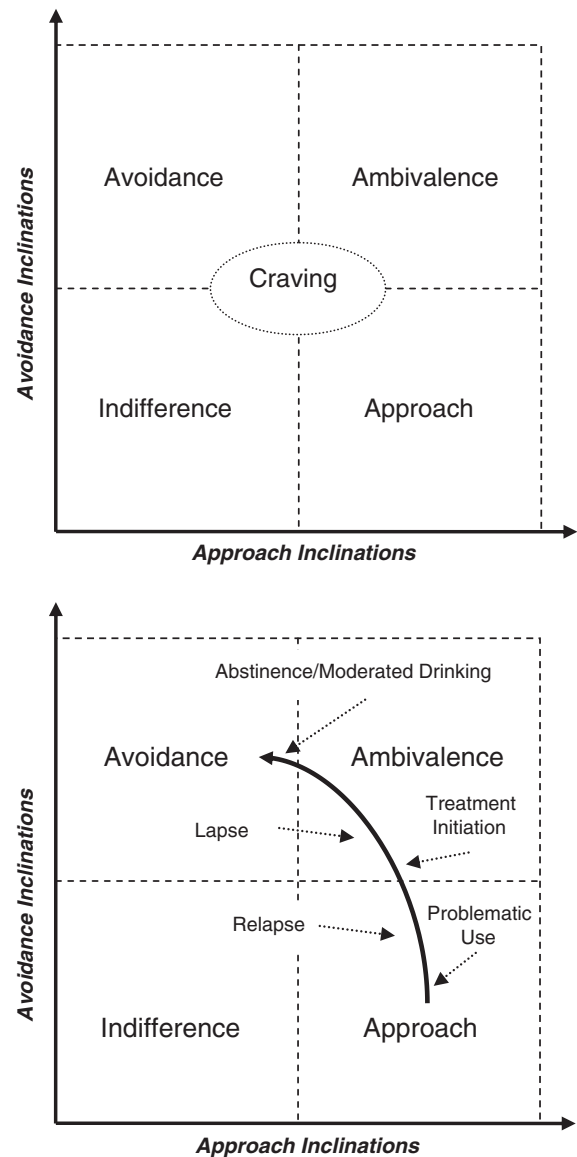


Fig. 1. Ambivalence model of craving. Top panel adapted from Breiner et al. (1999), and bottom panel adapted from Stritzke et al. (2007).

approach inclinations on drinking (Schlauch, Levitt, et al., 2012), is incrementally related to taking steps to make a change (Klein, Stasiewicz, Koutsky, Bradizza, & Coffey, 2007; Schlauch, Breiner, et al., 2012; Schlauch, Stasiewicz, et al., 2012), and distinguishes between clinically significant subgroups of smokers trying to quit (high approach, high avoidance) and not quit (high approach, low avoidance; Stritzke et al., 2004). Finally, avoidance inclinations may be more predictive of relapse among alcoholics, rather than increases in approach inclinations (Stritzke et al., 2007). This is important as it suggests that once internal or external cues trigger urges to use, people can resist them but it takes effort (Tiffany, 1990). The AMC provides a framework for which alcohol/drug use is not inevitable when approach is activated, but rather dependent on competing desires and effortful control such that the stronger one's avoidance inclinations are, the less likely the decisional balance tips in favor of use. However, despite these promising findings, to date no studies have examined the factors influencing both approach and avoidance inclinations.

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