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Does Alexithymia Explain Variation in Cue-Elicited Craving Reported by Methamphetamine-Dependent Individuals?

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Abstract

Drug craving is an important motivational phenomenon among addicted individuals and successful management of craving is essential to both the initiation and maintenance of abstinence. While craving in response to drug cues is common in drug-dependent individuals, it is not universal. At the present time, it is not known why approximately 20–30% of all addicted persons fail to report appreciable craving in laboratory-based cue reactivity studies. The present study examined the possibility that alexithymia, a personality attribute characterized by a difficulty identifying and describing emotions, may contribute to the impoverished cue-elicited craving experienced by some addicts. Specifically, we tested the hypothesis that alexithymia, as measured by the Toronto Alexithymia Scale (TAS), would be inversely related to the magnitude of cue-elicited craving obtained in a cue reactivity protocol. Forty methamphetamine-dependent individuals completed the TAS and provided craving ratings for methamphetamine after presentation of methamphetamine-associated cues. Thirteen participants (32%) reported no methamphetamine cue-elicited craving. Contrary to expectation, TAS factor 1 (a measure of difficulty identifying feelings) scores were positively associated with cue-elicited craving. Thus, the results suggest that increasing difficulty identifying feelings may be associated with higher cue-elicited craving. Clinical implications for this finding are discussed.

Introduction

While drug craving has been defined many ways, it is generally characterized as a subjective experience of desire^{1,2} to re-experience the effects of a psychoactive substance³. Craving is a central feature of addictive behavior that is measured using multi-item or single item questionnaires. It is commonly studied using laboratory-based cue reactivity methodologies, which involve rigorous measurement of responses to drug-related cues. Importantly, cue reactivity studies have documented that approximately 20–30% of addicted individuals report little or no cue-elicited craving^{4,5}. Similarly, individuals receiving treatment often

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deny experiencing cravings⁶. Given that current evidence-based treatments place a heavy emphasis on the monitoring and management of craving⁷, it is important to understand why a significant minority of addicted persons fail to report craving. Improved understanding of this phenomenon might aid in the development of more individualized treatment for substance use disorders (i.e., if an individual denies the experience of craving, it may make little sense to spend excessive time providing interventions that focus on its mitigation).

It has been proposed that some substance dependent individuals may lack the ability to achieve meaningful insight into the nature of their responses to drug-related cues, rendering them unable to correctly identify or label their craving^{8,9}. While it is likely that many factors contribute to an impaired ability to articulate craving, one likely candidate is the personality trait known as alexithymia, which is characterized by a general difficulty identifying and naming emotions^{10,11}. Alexithymia has been observed more frequently among drug- and alcohol-dependent individuals relative to the general population^{12–14}. Additionally, there are some indications that alexithymia may be more prevalent in treatment seeking substance abusers who relapse vs. those who do not relapse¹⁰. Given these findings, it is reasonable to postulate that substance-dependent alexithymic individuals may also underreport craving due to difficulties detecting and/or expressing motivational states involved in the maintenance of drug-seeking behaviors. The present report is an archival study examining the relationship between alexithymia and baseline and cue-elicited craving within a sample of methamphetamine dependent individuals previously described^{15,16}. It is hypothesized that higher scores on the Toronto Alexithymia Scale (TAS), a gold standard for measuring alexithymia, will be associated with corresponding lower ratings of subjective craving (i.e., TAS scores will be inversely related cue-elicited craving). To our knowledge, no studies have examined the relationship between alexithymia and craving in response to drug cues in individuals with methamphetamine dependence, an evaluation that may provide insights for assessment, identification, and treatment of these individuals.

Methods

Participants

Men and women aged 18–50 who met DSM-IV Axis I criteria for methamphetamine dependence were included. Participants were recruited via referrals from treatment clinics in Pickens County, SC and from local area/community advertisements. Pickens County is located in the northwest region of South Carolina, which is the region with the highest levels of methamphetamine use in the state. Participant inclusion was not conditional on treatment status but all participants were required to verify abstinence from all drugs of abuse and alcohol the day of the laboratory test session (urine drug screen and breathalyzer were used to verify abstinence). Exclusion criteria included: the presence of major psychiatric disorders (e.g. psychotic spectrum, major mood and anxiety disorders) or major medical illnesses (e.g., hematologic disorders, endocrine disorders including diabetes, metastatic disease, cardio-pulmonary diseases including COPD and history of MI, etc). The Institutional Review Board (IRB) of the Medical University of South Carolina (MUSC) approved the study.

Study Measures

Alexithymia—The Toronto Alexithymia Scale^{17,18} (TAS-20) is a self-report questionnaire that employs twenty, 5-point Likert scales in the assessment of three empirically derived factors. The TAS is scored by summing individual item values for each factor (items are scored 1 to 5 with the exception of items 4, 5, 10, 18 and 19, which are reverse scored). A description of the TAS factors and a sample item for each factor is as follows: Factor 1 - consists of 7 items (1, 3, 6, 7, 9, 13, and 14) measuring ‘Difficulty Identifying Feelings’ (e.g.

“I often don’t know why I am angry”); **Factor 2** -consists of 5 items (2, 4, 11, 12, and 17) measuring ‘**Difficulty Describing Feelings**’ (e.g. “I find it hard to describe how I feel about people”; and **Factor 3** - consists of 8 items (5, 8, 10, 15, 16, 18, 19, and 20) measuring ‘**Externally-Oriented Thinking**’ (e.g. “I prefer to just let things happen rather than to understand why they turned out that way.”). A TAS total score is obtained by summing across all 20 items. Factors 1 and 2 are of primary interest in the evaluation of the hypothesis above. Clinical cutoffs have been established, with total scores of 61 or greater indicating alexithymia; scores of 52–60 indicating possible alexithymia, and scores less than 51 indicating low/no alexithymia.

The factor structure and general psychometric integrity of the TAS-20 has been repeatedly empirically demonstrated. In a recent reexamination of the factor analytic research on the TAS-20, Bagby et al¹⁹ reported that 17 of the 24 studies they reviewed confirmed the 3-factor structure (noted above) of the TAS-20. The internal consistency²⁰ and test-retest reliability²¹ of the TAS-20 has also been well-established. Evidence of convergent validity comes from studies which have identified a strong correlation ($r = .53$, $p < .01$) between TAS-20 scores and observer ratings of alexithymia²² and from studies that show alexithymia to be associated with an impaired ability to identify emotion in photos of facial expressions²³. Lastly, the TAS-20 has been validated for use with wide range of clinical populations^{24–27}, including substance abusers^{10,14,28–33}.

Methamphetamine craving—Self-report methamphetamine cue-elicited craving was assessed using a modified version of the Within Session Rating Scale³⁴. This modified instrument contains a 100 mm visual analogue scale (VAS) anchored with adjectival modifiers (“not at all, mildly, moderately, extremely”) that asks the participant to rate the desire to use methamphetamine “right now”. Values obtained from the VAS were whole numbers between 0 and 9. This single item approach to craving assessment has been successfully employed in numerous previous and on-going cue reactivity studies at MUSC^{35,36}. The predictive validity of VAS craving ratings has been established in studies that have demonstrated correlations between these measures of craving and subsequent substance use^{35,37,38}.

General Procedures

All participants were recruited and completed all laboratory procedures at the Behavioral Health Services clinic in Pickens, SC. Following informed consent procedures, participants underwent breath alcohol assessment, urine drug screen and a standardized clinical evaluation, including administration of the TAS. Participants were then scheduled to receive their laboratory cue reactivity assessment. Participants abstained from smoking during all laboratory procedures.

Cue Reactivity Procedures

Participants were presented with methamphetamine cues in three distinct stimulus modalities (see below) and provided post-cue ratings of craving immediately after completion of each cue presentation. Details of the cue reactivity procedures have been reported previously^{15,16}. In brief, methamphetamine cues consisted of a counterbalanced presentation of: (a) 30–35 methamphetamine-related still photographs, (b) a 7–8 minute video of individuals using methamphetamine, and (c) “in vivo” paraphernalia and simulated methamphetamine placed directly on a table in front of the participant for five minutes. The total exposure time for all three modalities of cues was approximately 20 minutes.

Data Reduction and Analyses

Data were analyzed using SPSS 17.0. Post-cue craving ratings were averaged across the three cue modalities. Pearson-r correlations were performed between the TAS Factor scores and mean post cue craving. Independent samples t-tests were used to compare non-craver and craver groups (defined below) on mean TAS factor and total scores.

Results

Table 1 contains the sample demographic/clinical data, including TAS total and factor scores and mean craving rating. Overall, the sample consisted of Caucasians who were mostly unmarried, unemployed (low income) women smokers with an HS degree (or less) and a mean age of 31.2. The mean total score for the TAS was 45.3 ($SD = 12.9$), with 6 individuals (15%) scoring at or above the cutoff for 'high alexithymia' (above a score of 61) and an additional 6 individuals (15%) meeting the cutoff for possible alexithymia (as defined above). The mean level of craving reported in this study was comparable to that reported in previous studies of methamphetamine users³⁹. The mean number of days since last methamphetamine use among participants ($n = 25$) was 33.5 days ($SD = 29.3$). TAS Factor 1 scores were positively correlated with mean post cue craving, $r = .41$, $p < .01$ (see Figure 1). The correlation between TAS factor 1 and mean post cue craving remained after controlling for demographic factors such as age and gender, $r = .38$, $p = .02$. TAS Factor 2 and Factor 3 scores were not correlated with mean post cue craving (r 's = .23 and $-.10$, p 's = .16 and .52, respectively). TAS total score was also unrelated to cue-elicited craving, $r = .29$, $p = .08$.

There were thirteen participants who reported no methamphetamine cue-elicited craving (32% of the sample was non-cravers). Contrary to expectation (i.e. that non-cravers would tend to be high scorers on TAS Factor 1), TAS factor and total scores within this subset of individuals spanned the entire range of possible values. Additionally, t-tests comparing non-cravers ($n=13$) with cravers ($n=27$) on mean TAS factor and total scores failed to identify any differences (all t 's < 1.0).

Discussion

We evaluated the association between alexithymia and craving among methamphetamine dependent individuals and hypothesized, as suggested by others^{8,40}, that higher levels of alexithymia would be associated with lower levels of self-report craving. This hypothesis was based on the logic that the primary feature of alexithymia, namely difficulty identifying and reporting subjective emotional experience, would extend to other forms of subjective experience such as drug craving^{41,42}. Contrary to the stated hypothesis, our results indicate that greater alexithymia was associated with greater cue-elicited methamphetamine craving. This positive association may in part be explained by the possibility that methamphetamine craving represents a somatic 'complaint' that is easily recognized by the alexithymic individual. This possibility is consistent with studies that have shown an association between alexithymia and anxiety, depression and general somatic/physical complaints^{13,24,43,44}.

Applying the primary hypothesis to just those participants who failed to report craving, one would expect non-cravers to exhibit uniformly high levels of alexithymia. Again, contrary to expectation, non-cravers evidenced a broad range of alexithymia scores and no evidence was found that non-cravers and cravers differed on alexithymia. Thus, it remains unclear whether the non-cravers had difficulty correctly identifying or describing their craving or whether they experienced no craving at all. If non-cravers do have difficulty identifying/describing their internal experience, it appears that this difficulty is not detectable using the "gold standard" measure of alexithymia. The question of what determines non-craving remains

open for future studies, as does the question of whether such individuals have unique liabilities with respect to treatment outcome.

Given the positive association between alexithymia and cue-elicited craving observed in the present study, it might be argued that methamphetamine-dependent individuals who are high in alexithymia may be especially responsive to interventions that focus on the amelioration of drug craving, such as cognitive-behavioral coping skills training i.e., relapse prevention;⁴⁵. However, prior studies have shown alexithymic vs. non-alexithymic cocaine abusers⁴⁰ to have better outcomes with a treatment that provides evaluation of response to medication and current functioning (i.e., clinical management) rather than a treatment that focuses on expression of internal affective states and identification/monitoring of cognitions/craving (i.e., relapse prevention). Relatedly, other investigators have recommended supportive/educational interventions^{46,47}, as well as other forms of behavioral techniques, such a relaxation⁴⁸ in the treatment of alexithymic patients. These types of treatments appear consistent with growing recognition that alexithymic patients may not respond well to psychotherapeutic interventions that demand access to internal affective and cognitive states^{40,46}. It remains unclear, however, the degree to which alexithymic methamphetamine-dependent individuals will respond favorably to psychotherapeutic interventions that focus on the amelioration of craving. Indeed, more studies are needed that replicate the finding that alexithymic patients fare less well with relapse prevention interventions relative to other types of treatments (i.e., clinical management, supportive/educational interventions) and determine the factors that may preclude these patients from benefitting maximally from relapse prevention strategies. Several limitations of this study should be noted. First, the findings of the present study are most relevant to rural methamphetamine-dependent individuals and, therefore, may not reflect the relationship that exists between alexithymia and craving in either urban methamphetamine users or other substance-abusing populations (e.g., marijuana users). Furthermore, the majority of participants in this study were females in treatment, which could conceivably limit the generalizability of the findings. Second, the modest sample size may have precluded the identification of some more subtle associations involving the TAS (e.g., an association between TAS scores in the sub-group of craving non-responders). Third, the lack of follow-up data on substance use among the study participants precludes an assessment of the potential clinical utility of the association between TAS alexithymia scores and methamphetamine craving. Most of these limitations could be addressed in future studies that employ larger, demographically diverse samples, with several sub-groups addicted to different substances, and that follow participants for one to two months after initial study contact.

In summary, the present study revealed that alexithymia-related deficits in emotion identification appear to be positively associated with craving levels reported in response to methamphetamine cues. Additionally, the subset of participants who failed to report craving (i.e., non-cravers) did not appear to have either alexithymia scores skewed towards the higher end of the scale(s) or alexithymia scores that differed appreciably from individuals who did report craving (i.e., cravers). As with most preliminary studies, the results reported here need to be replicated, and importantly, future studies should examine the relationship between alexithymia and craving in a variety of substance abusing populations.

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Figure 1.
Level of association between TAS factor 1 alexithymia scores (horizontal scale) and methamphetamine cue-elicited craving (vertical axis; craving rating 0 = no craving & 9 = extreme craving).

Table 1**Demographic and Clinical Characteristics of Participants (n=40)**

Age, m (sd)	31.3 (7.1)	Cigarette smoker $\bar{x}$, %	92.1
Female, %	75.0 (30)	In treatment program $\bar{x}$, %	71.1
Caucasian, %	100.0 (40)	# of years using in lifetime, m (sd) *	6.6 (4.4)
Education, %			
No HS diploma	47.5	TAS Total Score, m (sd)	45.3 (12.9)
HS graduate	42.5	TAS Factor 1 Score	13.8 (7.0)
Some college	10.0	TAS Factor 2 Score	11.9 (5.1)
Marital status, %		TAS Factor 3 Score	19.7 (3.6)
Married	17.5	Cue-elicited craving, m (sd)	3.3 (3.2)
Separated/Divorced	37.5		
Never married	45.0		
Employed, %	35.0		
Methamphetamine Use	Past 90 Days	Past 60 Days	Past 30 Days
Active use $\bar{x}$, %	65.8	50.0	39.5
Number of using days $\bar{x}$, m (sd)	19.6 (26.3)	10.6 (15.6)	3.2 (5.6)
Total \$ amount used $\bar{x}$, m (sd)	1277 (2410)	705 (1448)	229 (555)

Notes: m = mean, sd = standard deviation;

$\bar{x}$ indicates parameter estimate is based on n = 38;

* indicates parameter based on n = 26.