#  **The experimental manipulation of desire thinking**

# **in alcohol use disorder**

**Practitioner Report**

Word count (all sections included): 3,168

Date of 1st submission: 06/01/2016

Gabriele Casellia,b,c, Antonella Gemellia and Marcantonio M. Spadab,\*

a Studi Cognitivi, Modena, Italy

b School of Applied Sciences, London South Bank University, London, UK

c Sigmund Freud University, Milan, Italy

\* Correspondence should be addressed to: Marcantonio Spada, Division of Psychology, School of Applied Sciences, London South Bank University, e-mail spadam@lsbu.ac.uk.

**Abstract**

**Objective:** Desire thinking is a voluntary cognitive process involving verbal and imaginal elaboration of a desired target. Recent research has revealed that desire thinking may play a significant role in the escalation of craving. The goal of this study was to explore the effect of a desire thinking induction on craving in a sample of patients with alcohol use disorder. **Methods:** Ten patients with alcohol use disorder were exposed to a brief exposure to alcohol-related thoughts plus desire thinking induction versus brief exposure to alcohol-related thoughts plus distraction. **Results**: The induction of desire thinking led to a significant increase in distress and urge to use alcohol when compared to a behavioural assessment test and a distraction task. The clinical implications for the treatment of alcohol use disorder are discussed.

**Key words**: addiction; alcohol use disorder; craving; desire thinking; experimental clinical psychology.

**Key Practitioner Message:**

* Psychotherapeutic strategies that target desire thinking, both at the assessment and at the intervention levels, may be relevant in the treatment of craving-related problems.
* Deriving and illustrating the role of desire thinking in a given episode of craving may support the development of metacognitive awareness about its functions and consequences.

**1. Introduction**

Desire thinking is a conscious and voluntary thinking process orienting to prefigure images, information and memories about positive target-related experience (Kavanagh, Andrade & May, 2004; 2005; Caselli & Spada, 2010, 2011). Desire thinking has two components: imaginal prefiguration and verbal perseveration (Caselli & Spada, 2011). The imaginal prefiguration component refers to the allocation of attentional resources to target-related information and a multi-sensory elaboration in the form of anticipatory positive imagery or positive target-related memories recall. The verbal perseveration component refers to a prolonged self-talk activity about identifying good reasons for reaching a desired target and planning how to engage in the desired activity.

Research has shown that thinking about a desired target is closely linked to levels of craving (Caselli &Spada, 2015; Green, Rogers & Elliman, 2000; Tiffany & Drobes, 1990). Craving has been conceptualized as a powerful subjective experience that motivates individuals to seek out and achieve a craved target, or practice a craved activity, in order to reach its desired effects (Marlatt, 1987). Research evidence has demonstrated that the experience of craving is qualitatively similar across a range of targets, including alcohol, food, soft drinks and tobacco (e.g. Castellani &Rugle, 1995; Field, Schoenmakers &Wiers, 2008; May, Andrade, Panabokke& Kavanagh, 2004; Moreno, Warren, Rodriguez, Fernandez & Cepeda-Benito, 2009). Desire thinking can be associated to craving because it may induce physiological change similar to what is induced by direct exposure to target related cues (Bywaters, Andrade & Turpin, 2004; Witvliet & Vrana, 1995). As a consequence of this, desire thinking may magnify levels of craving and/or sustain it independently from a direct contextual based exposure.

A series of qualitative, cross-sectional and experimental studies have explored the role of desire thinking across everyday desires (Caselli &Spada, 2015; Caselli, Manfredi, Ferraris, Vinciullo & Spada, 2015) and craving for addictive behaviours, including alcohol use (Caselli, Ferla, Mezzaluna, Rovetto &Spada, 2012; Caselli et al., 2015), nicotine use (Caselli, Nikčević, Mezzaluna & Spada, 2012), problem gambling (Fernie, Caselli, Giustina, Donato,Marcotriggiani&Spada, 2014), problematic Internet use (Spada, Caselli, Slaifer, Nikčević & Sassaroli, 2013) and binge eating (Spada et al., 2015). Research has also shown that desire thinking facets are active during a craving episode in individuals with alcohol abuse, nicotine dependence, problematic gambling and binge eating (Caselli & Spada, 2010). In addition desire thinking has been found to predict craving in alcohol abusers independently from level of alcohol use (Caselli & Spada, 2011).

The findings from these studies support the distinction between desire thinking and craving, and the role of desire thinking in generating an escalation in frequency and intensity of craving and emotional distress. Caselli and Spada (2010; 2011) purport that in the short term, desire thinking allows for a shifting of attention onto the elaboration of a desired target, providing an immediate anticipation of pleasant states and relief from distress. However, in the medium to longer term, the perseveration of desire thinking brings to an escalation of emotional distress and urges because attentional resources become locked onto salient intrusions and the perceived sense of deprivation is heightened, as the desired target is repeatedly imagined but not achieved. This, in turn, increases the probability of engaging in addictive behavior as a means to attain relief from this mode of processing.

A recent experimental study demonstrated that the induction of desire thinking had a significant effect on craving compared to distraction across a range of addictive behaviours in a community sample (Caselli, Soliani & Spada, 2013). The impact of desire thinking was independent of baseline craving. Moreover, the induction of desire thinking tended to sustain elevated craving across the following 3-days of abstinence period. The main limitations of this study were the between participant experimental design and the non-clinical nature of the sample. The purpose of the current study was to extend the investigation about the effect of desire thinking on craving in patients with Alcohol Use Disorder (AUD). In particular, we tested: (1) whether the induction of desire thinking would have a stronger effect on craving than brief exposure (behavioural assessment test); and (2) whether the induction of desire thinking would have a stronger effect compared to a control cognitive response in the form of distraction.

**2. Method**

2.1. Design

 A counterbalanced repeated measures design was adopted to test the experimental hypothesis. All participants were exposed to two experimental conditions (desire thinking versus distraction) after a simple exposure to alcohol-related thoughts (behavioural assessment test). Order effects were controlled for by counterbalancing the sequence of conditions (with brief interventions reducing some carry-over effect) and by a randomized allocation to the two conditions. The independent variable was the task given to the participants. The effects of the tasks were examined on two visual analogue scales (dependent variables) that were about state distress and urge to use alcohol.

 In the behavioural assessment test (BAT) participants did not receive any instruction. In the desire thinking condition (DT) participants were given a rationale derived from the desire thinking manipulation task (Caselli, Soliani &Spada, 2013). In the distraction condition (DS) participants were given a rationale based on Nolen-Hoeksema and Morrow’s (1993) distraction task.

2.2. Participants

Ten patients (four female) referred to the Addiction Center, Gruppo CEIS, Modena, Italy, were included in the study. All potential participants were assessed clinically with respect to their appropriateness for inclusion in the study. Inclusion criteria were: (1) age of 18 or above; (2) understanding of written and spoken Italian; (3) absence of co-occurring substance use disorders over the previous 12 months (with the exception of tobacco use disorder); (4) absence of cognitive deficits or mental retardation; (5) absence of severe organic disorders; (6) diagnosis of AUD (according to DSM-5 criteria, APA, 2013); and (7) medication free or stable on medication.

The mean age of the sample was 42.7 years (SD=3.9 years). The participants consumed an average of 51.5 units per week (SD=16.2) and their mean scores on the Alcohol Use Disorders Identification Test (AUDIT*;* Babor, de la Fuente, Saunders & Grant, 1992) and the Penn Alcohol Craving Scale (PACS, Flannery, Volpicelli & Pettinati, 1999) were 32.62 (SD=6.1) and 17.88 (SD=6.2) respectively. The mean scores on Desire Thinking Questionnaire (DTQ; Caselli &Spada, 2011) were 10.8 (SD=2.8) for imaginal prefiguration component and 13.11 (SD=2.6) for verbal perseveration component. The average duration of alcohol-related problems was 16.3 years (SD=6.6 years). The entirety of the sample was Caucasian.

2.3. Dependent measures

 Two visual analogue scales were constructed to assess the dependent variables. Each scale was administered at 1, 3 and 5 min after the BAT, DT and DS conditions. Each scale was rated on a 0-100 range. One item referred to the intensity of distress from 0 (“*Not at all*”) to 100 (“*The most distressed I have ever been*”). One item referred to the intensity of urge to use alcohol from 0 (“*I do not feel the urge to drink at all*”) to 100 (“*My urge to drink cannot be any stronger*”).

2.4. Procedure

 Following the diagnostic screening, participants were interviewed in order to identify high-risk situations and a list alcohol-related thoughts. Alcohol-related thoughts were identified by asking:*“What was the first thought or mental image associated to drinking you were usually aware of*?”, or*“What was the thought that usually made you decide to drink?”* Subsequently the list of alcohol-related thoughts was transcribed. Finally the participants read aloud their transcribed thoughts onto a 30s closed-loop audio recording. Themes around these thoughts usually referred to the positive consequences of drinking, negative consequences of abstinence, permissiveness and self-indulgence, the minimization of negative consequences, and entitlement or self-enhancement.

 All participants were administered the BAT condition followed by the two counterbalanced conditions within a single 1 hour session. Each participant was told that ratings of their distress andurge to use alcohol would be taken on three occasions (1, 3, and 5 min) after each condition. All participants were given a practice in undertaking ratings before beginning of the experiment.

 The baseline consisted of a 5 minute imagery exposure to the highest-risk situation for each participant. In addition, participants were asked to listen to the closed-loop audio recording of their own voice repeating their alcohol-related thoughts. No additional instructions were given.

 Following the baseline, participants were told that the task would shortly be repeated. Before each condition, the appropriate rationale and instructionswere read to each participant and they were asked to follow instructions during the forthcoming exposure task. In the DT condition participants were asked to follow their thoughts, focus on sensations evoked by listening to the closed-loop audio recording and plan future potential opportunities to drink and to reflect about good reasons to drink. In the DS condition participants were asked to try to mentally prefigure neutral stimuli such geometric shapes. Immediately after each condition, participants indicated what proportion of their thoughts (0-100%) during the experimental task were concerned with the task.

2.5. Data analysis

 Wilcoxon Signed Ranks Tests were used to analyse the effects of the experimental manipulation on the dependent variables. The unit of comparison was change in scores of the dependent variables between the target condition and the previously administered condition. The previously administered condition was based on the sequence of delivery. For example the DT condition change scores for half the participants were computed as the difference between the BAT and the DT condition while for the remaining half as the difference between the DS condition and DT condition. Change scores for the DS condition were calculated using the same method.

**3. Results**

 Both distraction (*M*=61; *SD*=6,58) and desire thinking (*M*=56,5; *SD*=10,81) conditions were found to generate a similar proportion of task-associated thoughts (*z*=-1,65; *p*=.10). Descriptive statistics for the two dependent variables by condition are shown in Table 1. Figure 1 shows the median change scores for distress and urge to use alcohol by experimental condition. Negative change scores represent decreases in the dependent variables, and positive change scores represent increases in the dependent variables when compared with previously delivered condition. The DT condition resulted in increases in the levels of distress and urge to use alcohol after the 5 minutes. In contrast, the DS condition resulted in decreased distress compared with DT and BAT. A Wilcoxon signed-rank test showed that the increase in distress (*z=*-2.81, *p*=.01) and urge to use alcohol (*z=*-2.67, *p*=.01) following DT was significantly greater compared to DS.

 A closer inspection of individual trends showed that scores on distress and urge to use alcohol increased for all participant when DT followed DS while they remained almost stable for one participant and moderately increased when DT followed BAT. When DS followed BAT scores on distress and urge to use alcohol decreased for three participants and increased for two participants while when DS followed DT scores on all variables decreased for all participants.

**4. Discussion**

The goal of this study was to explore the effect of a desire thinking induction on craving in a population of patients with AUD. It was predicted that the induction of desire thinking would lead to a significant increase in distress and urge to use alcohol when compared to a behavioural assessment test and a distraction task. All these predictions were supported, providing empirical support for the role of desire thinking in enhancing and keeping alive the experience of craving. Since both conditions involved listening to the same loop audio recording of spoken alcohol-related thoughts, the difference in effect should not be simply due to exposure to these stimuli. These findings are consistent with those observed in a preliminary study (Caselli, Soliani & Spada, 2013) and add to the argument for the conceptualization of desire thinking as a processing mode that may be activated on a voluntary basis and that may lead to an escalation in craving.

 The clinical implications of these findings are that psychotherapeutic strategies that target desire thinking, both at the assessment and at the intervention levels, may be relevant in the treatment of craving-related problems. In terms of assessment, for example, information could be gathered not only in relation to craving but also in relation to the associated tendency to engage in desire thinking. Deriving and illustrating the role of desire thinking in a given episode of craving may support the development of metacognitive awareness about its functions and consequences (Caselli & Spada, 2015). With respect to interventions, it is plausible to assume that the modification of desire thinking may be a valuable add-on intervention to weaken the craving experience and to reduce risk of relapse after successful treatment. The modification of desire thinking may be obtained through the promotion of new cognitive and attentional skills aimed at increasing metacognitive monitoring and flexible control over attention and thinking style (Caselli & Spada, 2011; 2015).

 A series of limitations should be considered when evaluating our findings. Firstly, self-reported measures were employed and these are typically associated with bias and context effects (e.g. researcher allegiance). Secondly, almost allparticipants had received previous treatment which may have exposed them to the identification and exploration of cognitive constructs. However, standard treatment for AUD does not typically include the examination of desire thinking as assessed in this study. Thirdly, alcohol use status in the last month was only based on self-report. Breathalysing participants or corroborative reports at the time of data collection, or during previous weeks, could have improved the accuracy of the data. Finally, carry-over effects may have influenced the results, but the crossover design and randomization should have minimized this effect.

 In conclusion, the findings of this study indicate that desire thinking has a relevant effect on craving in a patients with AUD, supporting the conceptualization of this mode of processing as a risk factor for craving-related problems. If future research confirms this finding, then psychotherapy interventions for addictive behaviours may benefit from specifically addressing desire thinking.

**References**

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition).

Babor, T.F., de la Fuente, J. R., Saunders, J. & Grant, M. (1992). *The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Healthcare*. Geneva, Switzerland: World Health Organisation.

Bywaters, M., Andrade, J. & Turpin, G. (2004). Intrusive and non-intrusive memories in a non-clinical sample: the effects of mood and affect on imagery vividness. *Memory, 12,* 467-478.

Caselli, G., Canfora, F., Ruggiero, G.M., Sassaroli, S., Albery, I.P. & Spada, M.M. (2015). Desire thinking mediates the relationship between emotional intolerance and problem drinking. *International Journal of Mental Health and Addiction, 13*, 185-193.

Caselli, G., Ferla, M., Mezzaluna, C., Rovetto, F., & Spada, M.M. (2012). Desire thinking across the continuum of drinking behaviour. *European Addiction Research*, *18,* 64-69.

Caselli, G., Manfredi, C., Ferraris, A., Vinciullo, F., & Spada, M.M. (2015). Desire thinking as a mediator of the relationship between novelty seeking and craving. *Addictive Bheaviors Reports* 1, 2-6.

Caselli, G., Nikčević, A., Fiore, F., Mezzaluna, C., & Spada, M. M. (2012). Desire thinking across the continuum of nicotine dependence, *Addiction Research and Theory, 20*, 382-88.

Caselli, G., Soliani, M. & Spada, M. M. (2013). The effect of desire thinking on craving: an experimental investigation. *Psychology of Addictive Behaviours, 27*, 301-6.

Caselli, G., & Spada, M. M. (2010). Metacognitions in desire thinking: a preliminary investigation. *Behavioural and Cognitive Psychotherapy, 38,* 629-637.

Caselli, G., & Spada, M. M. (2011). The Desire Thinking Questionnaire: Development and psychometric properties. *Addictive Behaviors*, *36*, 1061-1067.

Caselli, G., & Spada, M. M. (2013). The Metacognitions about Desire Thinking Questionnaire: Development and psychometric properties. *Journal of Clinical Psychology*, *69*, 1284-9

Caselli, G. & Spada, M. M. (2015). Desire thinking: What is it and what drives it? *Addictive Behaviors*, *44,* 71-79.

Castellani, B. & Rugle, L. (1995). A comparison of pathological gamblers to alcoholics and cocaine misusers on impulsivity, sensation seeking and craving. *International Journal of Addiction 30,* 275-289.

Fernie, B.A., Caselli, G., Giustina, L., Donato, G., Marcotriggiani, A., & Spada, M.M. (2014). Desire Thinking as a predictor of gambling. *Addictive Behaviours, 39,* 793-796.

Field, M., Schoenmakers, T. & Wiers, R.W. (2008). Cognitive processes in alcohol binges: a review and research agenda. *Current Drug Abuse Reviews, 1,* 263-279.

Flannery, B. A., Volpicelli, J. R. & Pettinati, H. M. (1999). Psychometric properties of the Penn Alcohol Craving Scale. *Alcoholism: Clinical and Experimental Research, 23,* 1289-1295.

Green, M., Rogers, P., & Elliman, N. (2000). Dietary restraint and addictive behaviour: The generalisability of Tyffany’s cue reactivity model. *International Journal of Eating Disorder, 27*, 419-427.

Kavanagh, D.J., Andrade, J., & May, J. (2004). Beating the urge: Implications of research into substance-related desires. *Addictive Behaviours, 29*, 1399-1372.

Kavanagh, D.J., Andrade, J., & May, J. (2005). Imaginary Relish and Exquisite Torture: The Elaborated Intrusion Theory of Desire*. Psychological Review, 112*, 446-467.

Marlatt, G. A. (1978). Craving for alcohol, loss of control, and relapse: A cognitive behavioral analysis. In: P. E. Nathan, G. A. Marlatt & T. Loberg (Eds.), *Alcoholism: New Directions in Research and Treatment*. New York, USA: Plenum Press. pp. 271-314.

May, J., Andrade, J., Panabokke, N., & Kavanagh, D. (2004). Images of desire: cognitive models of craving. *Memory, 12*, 447-461.

Moreno, S., Warren, C. S., Rodriguez, S., Fernandez, M. C. &Cepeda-Benito, A. (2009). Food cravings discriminate between anorexia and bulimia nervosa. Implications for “success” versus “failure” in dietary restriction. *Appetite 52,* 588-594.

Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition and Emotion, 7,* 561-570.

Spada, M.M., Caselli, G., Fernie, B.A., Manfredi, C., Boccaletti, F., Dallari, G., Gandini, F., Pinna, E., Ruggiero, G.M., & Sassaroli, S. (2015). Desire thinking: A risk factor for binge eating? *Eating Behaviors, 18,* 48-53.

Spada, M.M., Caselli, G., Slaifer, M., Nikčević, A., & Sassaroli, S. (2014). Desire Thinking as a predictor of problematic Internet use. *Social Science Computer Review, 32,* 474-483*.*

Tiffany, S. T., & Drobes, D. J. (1990). Imagery and smoking urges: the manipulation of affective content. *Addictive Behaviours, 15,* 531-539.

Witvliet, C.V. & Vrana, S.R. (1995). Psychophysiological responses ad indeces of affective dimensions, *Psychophysiology, 32,* 436-443.

**Table 1:** Descriptive data for the two dependent variables by behavioural assessment test.

|  |  |
| --- | --- |
|  | Dependent variables |
|  | Distress | Urge |
| **Behavioural assessment test** |  |  |
| Mean | 25.0 | 45.7 |
| Median | 25.0 | 50.0 |
| Standard Deviation | 18.7 | 23.4 |
| Interquartile range | 30.0 | 32.5 |
| **Desire Thinking** |  |  |
| Mean | 40.7 | 58.3 |
| Median | 40.0 | 65.0 |
| Standard Deviation | 23.8 | 19.5 |
| Interquartile range | 52.5 | 20.0 |
| **Distraction** |  |  |
| Mean | 11.3 | 16.7 |
| Median | 10.0 | 10.0 |
| Standard Deviation | 15.5 | 10.9 |
| Interquartile range | 20.0 | 10.0 |

**Figure 1:** Median changes in distress and urge to use alcohol in distraction and desire thinking conditions.

