# **Experimental modification of perspective on thoughts and metacognitive beliefs in alcohol use disorder**

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**Abstract**

Metacognitive therapy is designed to impact directly on cognitive monitoring and control processes such that individuals can develop alternative ways of experiencing and regulating thoughts. One technique used for this purpose is ‘detached mindfulness’ which promotes a decentred perspective to thoughts and decouples repetitive thinking and coping from their occurrence. This study set out to test the effects of detached mindfulness against a control condition, a brief exposure to alcohol-related thoughts. Eight patients diagnosed with alcohol use disorder in an abstinence regime were exposed to detached mindfulness versus brief exposure in a counterbalanced repeated-measures design. Results showed that detached mindfulness led to significantly greater decreases in meta-appraisal and metacognitive beliefs about alcohol-related thoughts compared to a brief exposure. Significantly greater decreases in distress and urge to use alcohol were also observed in detached mindfulness. The clinical implications are discussed.

**Key words**: alcohol use disorder; craving; detached mindfulness; metacognition; metacognitive beliefs; metacognitive therapy.

**1. Introduction**

Metacognition can be defined as knowledge and cognitive processes that are involved in the appraisal, control and monitoring of thinking (Wells, 2000). In the last twenty five years metacognition has been applied to the conceptualization and treatment of anxiety disorders and depression with notable results (Normann, van Emmerik and Nexhmedin, 2014; Wells, 2009). The metacognitive model of psychopathology emphasises the importance of the processes which generate, monitor and maintain intrusive cognitive experiences, rather than focusing upon the content of such experiences (Wells, 2009). From this perspective, psychological distress is maintained by the activation of the Cognitive Attentional Syndrome (CAS), which consists of perseverative thinking, thought suppression, threat monitoring and avoidance. Once activated, the CAS focuses attention towards distress congruent information, locking the individual into a vicious cycle appraised as distressing but where a successful resolution fails to be achieved. The maintenance of the CAS is influenced by metacognitive knowledge. Metacognitive knowledge is conceptualised as beliefs about cognition that are positive and negative in content (e.g. “Worrying will help me cope” and “Some thoughts are dangerous”) and generic plans for guiding cognition and behaviour. Recently, it has been proposed that the metacognitive model can be applied to alcohol use disorder (AUD; Spada and Wells, 2005, 2006; Spada, Caselli and Wells, 2013; Spada, Caselli, Nikčević and Wells, 2015). According to this formulation metacognitive beliefs can lead to the activation of CAS components associated with AUD such as rumination and worry about alcohol-related intrusions, the monitoring of alcohol-related cues, and the suppression of alcohol-related thoughts. Consistent with such an application metacognitive beliefs identified in AUD include beliefs about the dangerousness and need to control alcohol-related thoughts (Spada and Wells, 2005; 2006; Spada, Caselli and Wells, 2009; 2013) e.g. *“Thoughts about drinking are dangerous and should always be avoided”.* Metacognitive beliefs may have an impact on AUD by increasing levels of distress and craving through the activation and persistence of maladaptive modes of information processing (the CAS) based on worry, rumination, and thought suppression. More adaptive metacognitive beliefs like “*Thoughts are not facts”* or *“My worry is controllable”* can result in acquiring a metacognitive mode capable of inhibiting the CAS.

Empirical support for the general role of metacognitive beliefs in AUD has been steadily accumulating. For example metacognitive beliefs have been found to: (1) predict the severity of alcohol use in clinical and non-clinical samples (Clark, Tran, Weiss, Caselli, Nikčević and Spada, 2012; Spada and Wells, 2009, 2010); (2) be elevated across drinking behaviour (Spada and Wells, 2005; Spada, Zandvoort and Wells, 2007); and (3) predict drinking behaviour independently of alcohol outcome expectancies in non-clinical samples (Spada, Moneta and Wells, 2007). Metacognitive beliefs have also been found to play a role in the escalation of craving in both AUD patients and non-clinical populations (Caselli and Spada, 2010; 2013; 2015). Spada, Caselli and Wells (2009) have also shown that high levels of beliefs about needing to control thoughts prospectively predict relapse and high levels of alcohol intake at 3, 6 and 12 months follow-up in outpatients in an abstinence regime.

Whilst these data are indicative of an involvement of specific metacognitive beliefs in alcohol use disorder, there have been no attempts to examine the effects of directly manipulating metacognitive processing of cognitive content in this disorder.

Detached mindfulness is a technique which is aimed at achieving a direct modification of reactions to thoughts in order to modify metacognitive knowledge. It is characterised by meta-awareness and distancing in the absence of effortful processing or coping (Wells, 2005). Detached Mindfulness requires the recognition and suspension of conceptual analysis or thought suppression efforts. Three earlier studies have examined the effects of using Detached Mindfulness to manipulate metacognitive processing. Gkika and Wells (2015) have demonstrated that Detached Mindfulness produces wider-ranging effects than thought challenging in reducing speech anxiety. Wells and Roussis (2014) have shown that Detached Mindfulness is effective in reducing intrusions immediately after stress-exposure, and Ludvik and Boschen (2015) have demonstrated that Detached Mindfulness has wider-ranging ameliorative effects on the negative consequences of repeated checking when compared with cognitive restructuring in a non clinical sample. The application of Detached Mindfulness in AUD would require the patient to purposefully step back from their alcohol-related thoughts and see them as passing events that do not require a response. This process should facilitate the discovery that alcohol-related thoughts are not dangerous, do not need further processing, and do not necessary lead to uncontrolled behaviour. This metacognitive approach would differ markedly from traditional cue-exposure because the latter posits that the repeated presentation of a cue should result in a decreasing reaction (habituation) to the elicited response (Monti and Rohsenow, 1999). Detached Mindfulness, on the other hand, would be aimed at helping the patient shift to metacognitive processing to disrupt perseverative thinking, modifying an individual’s perspective on thoughts and testing the validity of their maladaptive metacognitive beliefs.

In the present study we tested whether a brief Detached Mindfulness technique would be more effective than a control condition (brief exposure) in reducing negative meta-appraisal of alcohol-related thoughts and conviction in maladaptive metacognitive beliefs. We also tested the association between this change with reduction in distress levels and urge to drink.

**2. Method**

2.1. Design

A counterbalanced repeated measures design was used. All participants were exposed to both experimental conditions. 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 potential sequences. The independent variable was the task (Detached Mindfulness or Brief Exposure) given to the participants. The effects of the two tasks were examined on six visual analogue scales (dependent variables). Two scales assessed levels of distress and actual urge to drink. Two scales evaluated negative meta-appraisals of alcohol-related thoughts. The remaining two scales measured metacognitive beliefs about: (1) the need to control alcohol-related thoughts; and (2) the negative impact of alcohol-related thoughts on behaviour, a form of thought-action fusion belief (Shafran, Thordarson and Rachman, 1999).

2.2. Participants

Eight patients (four female) referred to the Addiction Centre, 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 disorder over the previous 12 months (with the exception of tobacco use disorder); (4) absence of cognitive deficits or Intellectual Developmental Disorder; (5) diagnosis of Alcohol Use Disorder (according to DSM-5 criteria, APA, 2013); (6) medication free or stable on medication; (7) abstinent regime.

The mean age of the sample was 42.0 years (SD = 4.1 years, range = 35-50) and the average years of education were 10.9 (SD = 2.7). The participants’ mean scores on the Alcohol Use Disorders Identification Test (AUDIT;Babor, de la Fuente, Saunders and Grant, 1992) were 28.5 (SD = 3.9). The average duration of alcohol-related problems was 12.1 years (SD = 3.8 years). The average abstinence period was 8.3 months (SD = 5.8).Four participants were specified as in early remission, four participants were specified as in sustained remission. None of the participants were in a controlled environment. Four participants were medication free. Four participants were stable on medication, one was using an antidepressant and three were using an atypical antipsychotic.The criterion A4 of DSM-5 (APA, 2013) “Craving, or a strong desire or urge to use alcohol was met for all participants. The sample was entirely Caucasian.

2.3. Dependent measures

Six visual analogue scales were constructed to assess the dependent variables. Each scale was administered at 1, 3 and 5 minutes during behavioural assessment test and during the two experimental conditions. Each scale was rated on a 0-100 range. Two items referred respectively to (1) intensity of distress (“*How much do you feel stressed now?”,* from “*Not at all*” to “*The most distressed I have ever been*”); (2) intensity of urge to drink (“*How strong is your urge to drink now?”,* from “*I do not feel the urge to drink at all*” to “*My urge to drink cannot be any stronger*”); (3) fear of alcohol-related thoughts (“*How much do you fear drinking thoughts now?”,* from *“Not at all”* to *“The most fear I have ever feel”*); (4) perceived uncontrollability (“*How much do you feel in control right now?”,* from *“Completely under control”* to *“Completely out of control”*). Two items were associated to different metacognitive beliefs: (1) the need to control alcohol-related thoughts (“*Drinking thoughts are dangerous and need to be controlled”*); and (2) the impact of alcohol-related thoughts on behaviour (“*Thinking about drinking can make me drink*”). These items were rated on a 0-100 scale with 0 labelled as “*I do not believe at all*” and 100 labelled “*I am completely convinced that it is true*”.

2.4. Procedure

Ethics approval for the study was obtained from the Studi Cognitivi Research Institute Ethics Committee. All potential participants were following an out-patient programme aimed at achieving abstinence which included psychoeducational and coping skills interventions that were delivered on a weekly basis. Fifteen patients were invited to participate on a voluntary basis and twelve were enrolled. Two were excluded because of the presence of co-occurring substance use disorders, and a further two because of a recent episode of relapse. We have no information about the motivations that led other invited patients to refuse to participate in the study. Participants were informed about the study and experimental treatment during a preliminary meeting with the second author who determined both diagnosis, according to DSM-5 (APA, 2013), and inclusion criteria.

Following diagnostic screening, participants were interviewed in order to identify a list of alcohol-related thoughts. Alcohol-related thoughts were identified by asking: *“What is the first thought or mental image associated with drinking you are usually aware of before drinking*?”, 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 30 second closed-loop audio recording. Themes around these alcohol-related thoughts usually referred to the positive consequences of using alcohol, negative consequences of abstinence, permissiveness and self-indulgence, the minimization of negative consequences, and entitlement or self-enhancement.

All participants received a Behavioural Assessment Test followed by the two counterbalanced conditions within a single 1 hour session. Each participant was told that ratings on the six dependent variables would be taken on three occasions (1, 3, and 5 minutes) during each condition. All participants were given a practice in undertaking ratings before beginning of the experiment. In the Behavioural Assessment Test, 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 administration of the Behavioural Assessment Test, participants were told that the task would shortly be repeated. Before each condition, the appropriate rationale and instructions were read to each participant and they were asked to follow instructions during the forthcoming exposure task. Immediately after the instructions were given, the perceived usefulness ratings of each technique were collected in order to check for significant differences in expectancy. This consisted of a single visual analogue scale (0-100) with anchor points of 0 = “*Not at all useful”* and 100 = *“Completely useful*” in response to the question “How useful do you think this will be in achieving a greater control over yourself?” In the Brief Exposure we adopted a habituation rationale (Monti and Rohsenow, 1999) as a control condition. Participants were asked to “*Listen to the audio recording and focus on the words but abandon your usual strategies and responses for dealing with them. It is like staying in a cold swimming pool, you get used to it with the passing of time*”. In the Detached Mindfulness condition we adopted a metacognitive rationale to drive a new perspective on thoughts and a new flow of information with regards to: (1) thoughts as not relevant passing events; (2) controllability of the response to thoughts; and (3) harmlessness of abandoning efforts to control thoughts. Participants were asked to “*Listen to the audio recording and focus on the words but take a step back and see them as passing events that need no responses. Thoughts are like a not relevant and harmless telephone ringing, despite the fact you hear it, you do not need to answer it, and look what happens*”.

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 Detached Mindfulness condition change scores for half the participants were computed as the difference between the Behavioural Assessment Test and the Detached Mindfulness condition while for the remaining half as the difference between the BE condition and the Detached Mindfulness condition. Change scores for the control condition were calculated using the same method.

**3. Results**

Both the Detached Mindfulness (*M* = 61.3; *SD* = 5.2) and Brief Exposure (*M* = 58.1; *SD* = 10.3) conditions were found to be perceived as equally useful (*z* = -1.1; *p* = .28). Descriptive statistics for the four dependent variables by condition are shown in Table 1. Figure 1 shows the median change scores for distress, urge to drink, fear of alcohol-related thoughts, perceived uncontrollability and metacognitive beliefs, by experimental condition. Negative change scores represent decreases in the dependent variables, and positive change scores represent increases in the dependent variables. The Detached Mindfulness condition resulted in decreases in the levels of distress, urge to drink, fear of alcohol-related thoughts, perceived uncontrollability and metacognitive beliefs during the 5 minutes. In contrast, the Brief Exposure condition resulted in an increase in all variables.

A Wilcoxon signed-rank test showed that the decrease in fear of alcohol-related thoughts (*z =* -2.5, *p* = .01), perceived uncontrollability (*z =* -1.9, *p* = .05), metacognitive beliefs about the need to control drinking thoughts (*z =* -2.4, *p* = .02) and thought-action fusion (*z =* -2.0, *p* = .04) following Detached Mindfulness was significantly greater than that found in participants who had received Brief Exposure. The Detached Mindfulness condition also produced a significant decrease in distress (*z =* -2.0, *p* = .04) and urge to drink (*z =* -2.3, *p* = .02).

A closer inspection of the individual trends showed that scores on each dependent variable decreased for all participants when Detached Mindfulness followed Brief Exposure while scores on each dependent variable remained almost stable for two participants and increased for two participants when Brief Exposure followed Detached Mindfulness. When Brief Exposure followed the Behavioural Assessment Test scores on distress, urge and negative meta-appraisal increased for all participants, scores on metacognitive beliefs remained stable for two participants and increased for two participants. When Detached Mindfulness followed Behavioural Assessment Test scores on each dependent variable decreased for all participants.

**4. Discussion**

In the current study we tested whether a brief Detached Mindfulness technique would be more effective than Brief Exposure in reducing: (1) negative meta-appraisal on alcohol-related thoughts; (2) conviction in maladaptive metacognitive beliefs; and (3) levels of distress and urge to drink.

We found that Detached Mindfulness led to greater immediate reductions in beliefs about alcohol-related thoughts than control condition, supporting the application of this technique as a strategy to modify metacognitive beliefs in AUD. The use of an exposure control condition permits some tentative partialling out of the effects of Detached Mindfulness. 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 or to usefulness expectancies. It appears that the superior effect of Detached Mindfulness could be attributed to the metacognitive manipulation of relating to these stimuli in a particular way. This goes beyond instructions to refrain from action as both conditions included this component. The greater effect of Detached Mindfulness on metacognitive appraisal and beliefs is consistent with the view that this procedure exerts a greater influence on metacognitive dimensions of processing.

From a therapeutic perspective these findings give rise to preliminary suggestions about the use techniques and principles of Metacognitive Therapy (MCT; Wells, 2009) in modifying metacognitive beliefs in AUD. In particular, these findings suggest that exposure to alcohol-related thoughts as an in-session experiment may lead to quicker changes in status when delivered within a metacognitive framework, implying that a direct focus on changing the relationship with thoughts, rather than simply habituating to their presence and inhibiting any reaction to them, may be of particular benefit. Detached Mindfulness may be a useful experiment to directly change negative meta-appraisal of thoughts and support the modification of metacognitive beliefs about the need to control alcohol-related thoughts and unhelpful beliefs about the importance of such thoughts in the control of behaviour. The findings also suggest that the information patients learn about their thoughts may be important in helping them develop more adaptive ways of relating to mental events, rather than simply trying to manage internal cognitive-affective states through abstinence or alcohol use.

A series of limitations should be considered when evaluating our findings that may suggest future research developments. In particular, the differences in distress and other outcomes between the two conditions occurred during the specified time line of the study. As the efficacy of exposure is time-dependent, future studies could examine the difference between these two conditions within a longer time line. Secondly, self-reported measures were employed and these are typically associated with bias and context effects (e.g. researcher allegiance). 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. Fourthly, carry-over effects may have influenced the results, but the crossover design and randomization should have minimized this effect. Finally, the most relevant issue is the limited size of the clinical sample. Further replications of this study, with a higher number of participants, are needed in order to guarantee power, stability and generalization of the present findings. In conclusion, the findings of this study indicate that there may be potential benefit in the application of Detached Mindfulness as a strategy to modify perspective on alcohol-related thoughts in patients with AUD.

**Role of Funding Source**

None.

**Conflict of Interest**

None.

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**Table 1 -** Descriptive data for the four dependent variables by behavioural assessment test.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Dependent variables | | | | | |
|  | Distress | Urge to use alcohol | Fear of alcohol-related thoughts | Perceived uncontrollability | Need to control alcohol-related thoughts | Thought-action fusion |
| **Behavioural Assessment Test** |  |  |  |  |  |  |
| Mean | 50.0 | 29.4 | 52.5 | 39.4 | 75.0 | 48.1 |
| Median | 50.0 | 30.0 | 50.0 | 42.5 | 75.0 | 50.0 |
| Standard deviation | 19.6 | 17.0 | 21.5 | 21.5 | 25.6 | 25.6 |
| Interquartile range | 33.8 | 22.5 | 42.5 | 23.8 | 70 | 38.8 |
| **Control (Brief Exposure)** |  |  |  |  |  |  |
| Mean | 56.3 | 45.0 | 68.1 | 42.5 | 73.1 | 51.9 |
| Median | 57.5 | 40.0 | 70.0 | 45.0 | 70.0 | 50.0 |
| Standard deviation | 15.3 | 14.1 | 19.1 | 17.3 | 19.1 | 30.0 |
| Interquartile range | 48.8 | 37.5 | 50.0 | 30.0 | 58.8 | 38.8 |
| **Detached Mindfulness** |  |  |  |  |  |  |
| Mean | 41.3 | 25.7 | 41.9 | 33.8 | 55.0 | 38.1 |
| Median | 42.5 | 17.5 | 40.0 | 27.5 | 55.0 | 37.5 |
| Standard deviation | 23.1 | 22.1 | 17.9 | 28.4 | 24.5 | 26.2 |
| Interquartile range | 20.0 | 10.0 | 28.8 | 13.8 | 40.0 | 22.5 |

**Figure 1** Median changes in distress, urge to use alcohol and metacognitive beliefs in Detached Mindfulness and Brief Exposure

