# Trait mindfulness and autobiographical memory specificity

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Short title: Mindfulness and memory specificity

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**Abstract**

Training in mindfulness skills has been shown to increase autobiographical memory specificity. The aim of this study was to examine whether there is also an association between individual differences in *trait* mindfulness and memory specificity using a non-clinical student sample ($N$ = 70). Also examined were the relationships between other memory characteristics and trait mindfulness, self-reported depression and rumination. Participants wrote about 12 autobiographical memories which were recalled in response to emotion word cues in a minimal instruction version of the Autobiographical Memory Test, rated each memory for seven characteristics, and completed the Freiburg Mindfulness Inventory, the Depression, Anxiety and Stress Scale, and the Ruminative Responses Scale. Higher rumination scores were associated with more reliving and more intense emotion during recall. Depression scores were not associated with any memory variables. Higher trait mindfulness was associated with *lower* memory specificity and with more intense and more positive emotion during recall. Thus, trait mindfulness *is* associated with memory specificity but the association is opposite to that found in mindfulness training studies. It is suggested that this difference may be due to an influence of trait mindfulness on memory encoding as well as retrieval processes and an influence on the mode of self-awareness that leads to a greater focus on momentary rather than narrative self-reference.

Keywords: individual differences; trait mindfulness; memory specificity; rumination; autobiographical memory

## Introduction

In contemporary Western psychology, the term *mindfulness* typically refers to an awareness characterised by deliberately paying attention to the present sensory and perceptual experience in a non-judgmental way, without being distracted by thoughts of the past or future (Dorjee 2010; Kabat-Zinn 1990). Bishop et al. (2004) proposed two main components of mindfulness: presence and acceptance. Presence refers to the self-regulation of attention such that it is focused on current experience as it changes from one moment to the next. This involves direct awareness without secondary elaboration of thoughts and feelings about the experience and promotes greater focus on what James (1890) called the momentary self, the 'I', overcoming the natural bias towards narrative self-awareness of the 'me' that extends over time (Farb et al. 2007). Acceptance refers to an orientation towards current experience characterised by curiosity, openness and active acceptance of what arises in awareness.

Mindfulness is a broad concept and is used to refer both to a *state* of awareness and a *trait* (Davidson 2010; Grossman 2011). It may refer to states cultivated through systematic meditation practices over extended periods of time, or to those cultivated via short (typically 8-week) courses of mindfulness-based therapeutic interventions such as mindfulness-based stress reduction (MBSR) programmes (Kabat-Zinn 1990). As a more stable trait, it refers to individual differences in the dispositional tendency to be mindful (e.g. Brown and Ryan 2003; Walach, Buchheld, Buttenmuller, Kleinknecht and Schmidt 2006; Walsh, Balint, Smolira, Fredericksen and Madsen 2009).

Recent studies have shown that short courses of training in state mindfulness can increase a characteristic of autobiographical memories known as specificity (Hargus, Crane, Barnhofer and Williams 2010; Heeren, van Broeck and Philippot 2009; Williams, Teasdale, Segal and Soulsby 2000). Specificity refers to the degree to which individuals retrieve specific memories for personal experiences when asked to do so; that is, memories that

occurred at a particular time and place and lasted less than one day. In Conway and Pleydell-Pearce's (2000) self-memory model of autobiographical memory, a hierarchy of memories extends from lifetime periods, through general events, to low-level, experience-near, specific memories rich in sensory and perceptual detail. Memory specificity is important because a lack of specificity is commonly associated with depression and with a history of trauma and abuse (van Vreeswijk and de Wilde 2004; Williams et al. 2007). Depressed individuals are less likely to produce specific memories in response to cue words in the Autobiographical Memory Test (AMT; Williams and Broadbent 1986). Their reduced specificity is usually accompanied by overgeneral memory characterised by an increase in the recall of categoric memories, a type of general memories that summarise a category of repeated events (e.g., Williams et al. 2007; Williams and Dritschel 1992).

Williams et al. (2000) showed that mindfulness-based cognitive therapy (MBCT) increased memory specificity and reduced overgeneral memory in formerly depressed patients. The mindfulness techniques taught in this programme of eight weekly classes and daily homework exercises aim to develop awareness of the present moment and sensory processing rather than higher-order processing, and acceptance rather than avoidance of cognitions that arise. Whereas the treatment-as-usual group showed no change in specificity, the MBCT group showed an increase in specific memories and a decrease in categoric memories. Similarly, Hargus et al. (2010) found that MBCT prevented the loss of memory specificity that was observed in a treatment-as-usual group of depressed participants who had not undergone the training. Heeren et al. (2009) replicated the effect of MBCT on memory specificity in a non-depressed sample. In a pre-test, the MBCT group and a control group showed equivalent levels of specificity in a French version of the AMT but following MBCT training, the mindfulness group reported more specific memories, and fewer categoric memories.

The influence of mindfulness training on specificity can be explained in terms of effects on memory retrieval. It has been argued that reduced specificity and overgeneral memory arise from three effects on retrieval processes: *functional avoidance* whereby a retrieval search is curtailed before reaching the level of specific memories to avoid the emotional disturbance they might elicit, *capture and rumination* in which retrieval processes are captured at the general level by abstract representations of generic self-related conceptual knowledge, and *impaired executive control* whereby there are not enough executive resources to overcome the impulse to end the retrieval search process at the general level or to resist capture by irrelevant self-related conceptual representations (Williams 2006; Williams et al. 2007). Mindfulness is a state of mind that decreases avoidance and rumination and increases working memory resources. Thus, the increase in specificity following mindfulness training can be explained in terms of a reduction in functional avoidance, capture and rumination, and an increase in executive control (Hargus et al. 2010; Heeren et al. 2009; Jha, Stanley, Kiyonaga, Wong and Gelfand 2010).

This is the first study to investigate whether there is an association between *trait* mindfulness and memory specificity. This is interesting because whereas short courses of mindfulness training influence memory *retrieval* processes only (because memories will have been encoded before training), trait mindfulness should influence both *encoding and retrieval*. While it is acknowledged that high trait mindfulness does not necessarily involve a mental state equivalent to that found in individuals who have been trained in meditation techniques (Davidson 2010; Grossman 2011; Thompson and Waltz 2007), it is likely that trait and state mindfulness share enough in common to expect trait mindfulness to influence memory specificity. The association between trait mindfulness and memory specificity was the primary focus of this study but also examined was the association between trait mindfulness and seven other memory characteristics because so far no other characteristics

apart from specificity have been investigated in relation to mindfulness. Three characteristics were properties of the memory: visual detail, emotional intensity and emotional valence remembered from the time of the event, and four were properties of the subjective experience during retrieval: reliving, emotional intensity and emotional valence during recall, and memory closure, the degree to which a memory feels resolved (Beike and Wirth-Beaumont 2005; Crawley 2010). Self-reported depression was measured because of its association with memory specificity (van Vreeswijk and de Wilde 2004; Williams et al. 2007), and self-reported rumination because it has been suggested that the brooding sub-component of rumination (Treynor, Gonzalez and Nolen-Hoeksema 2003) is associated with reduced specificity and that mindfulness is effective because it reduces brooding rumination (Teasdale, Segal and Williams 1995). Thus, the current study examined the associations between three individual differences measures; trait mindfulness, depression and rumination, and autobiographical memory characteristics including memory specificity in a non-clinical sample.

## Method

### *Participants*

Seventy undergraduates (54 female and 16 male) from the University of Sunderland participated in the study for course credits. Their mean age was 21 years 9 months (21:9), range 18-50 years, *SD* = 6:4.

### *Materials and Procedure*

Participants first completed a minimal instruction version of the AMT. This version is more appropriate for and sensitive to specificity variation in non-clinical samples than the traditional AMT (Debeer, Hermans and Raes 2009; Griffith et al. 2009, 2012). Following general instructions to recall and write about memories for personally experienced events, participants were asked to write down a memory in response to each of 12 emotion word

cues. The only restrictions were that the memory should not be from the past seven days or mentioned in response to another cue. Written responses were used on the basis of evidence from Raes, Hermans, Williams and Eelen (2006) that specificity is relatively stable with oral and written modes of response. The time limit to respond to each cue was 60 seconds. There were no further reminders that the memories should be specific, no examples of correct or incorrect responses, and no practice items. Six cues were positive (*happy, proud, brave, confident, calm, safe*) and six were negative (*sad, guilty, ashamed, fear, anxious, angry*). Cues were presented in one of two fixed orders, each alternating positive and negative words, one starting with a positive word, the other with a negative word.

After responding to all the cues, participants answered a number of questions and rating scales in relation to each memory. First they categorised the memory as *specific*, *categoric* or *extended*. The following definitions (with examples) were provided verbally and on a reminder sheet visible throughout the task: *Specific: an event that occurred at a particular time and place and lasted for less than one day; Categoric: a memory that summarises a number or category of events; Extended: a memory of a period lasting longer than a day.* If they were unsure or felt the memory fitted none of the descriptions, they were asked not to respond. They then rated the memory for seven characteristics using 7-point scales. The characteristics were: visual detail, emotional intensity at the time of the event, emotional valence at the time of the event, the degree of reliving during recall, emotional intensity during recall, emotional valence during recall, and memory closure. Definitions were provided, e.g., an open memory was defined as *one you think of as unfinished or unresolved in some way* and a closed memory as *one you think of as having been put behind you and finished with*. For emotional valence ratings, 1 = *extremely negative* and 7 = *extremely positive*, for closure ratings, 1 = *completely open* and 7 = *completely closed*, and for all other characteristics, 1 was the lowest rating and 7 was the highest.

Participants then completed three self-report questionnaires. First was the 14 item short form of the Freiburg Mindfulness Inventory (FMI, Walach et al. 2006). The FMI was chosen to measure trait mindfulness because, unlike some other measures (Grossman 2011), it yields scores that are positively associated with practice in state mindfulness. Scores for those who meditate frequently are higher than for those who meditate less frequently or not at all (Walach et al. 2006). The FMI yields separate measures for presence (six items e.g., *When I notice an absence of mind, I gently return to the experience of the here and now)* and acceptance (eight items e.g., *I see my mistakes and difficulties without judging them*) (Kohls, Sauer and Walach 2009). Items were rated 1 (*rarely*) to 4 (*almost always*) in relation to the last 30 days. Symptoms of depression were measured with the Depression, Anxiety and Stress Scale (DASS-21, Henry and Crawford 2005; Lovibond and Lovibond 1995). The seven depression items (e.g., *I felt I wasn't worth much as a person*) were rated 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*) in relation to the past two weeks. Finally participants completed the Ruminative Responses Scale (RRS, Treynor et al. 2003) indicating the extent to which they generally think or act in certain ways when they feel down, sad or depressed, rated 1 (*almost never*) to 4 (*almost always*). Separate scores were derived for reflection rumination (five items e.g., *Analyse recent events to try to understand why you are depressed*) and brooding rumination (five items e.g., *Think "Why can't I handle things better?"*).

Memories were categorised using the same procedure as Debeer et al. (2009). First, without reference to the participants' categorisation, an independent rater used the participants' written memory descriptions to categorise them as *specific*, *categoric*, *extended*, *semantic associate* (general semantic information associated with the cue), *omission* (no response within the time limit), *unsure* (the memory could plausibly belong to more than one category) or *other* (all other responses). The rater then compared their categorisation with that

of the participant. For memories categorised as *unsure*, they accepted the participant's category as long as it plausibly applied to the memory. Participant and rater categories conflicted for 203 memories (24%). These were categorised by a further two independent raters. If both additional raters agreed and their category agreed with that of the participant ($n$ = 37) or first rater ($n$ = 134), that category was assigned; otherwise, the memory was categorised as *other* ($n$ = 32).

There is no standardised method for deriving measures of specificity or overgeneral memory (Griffith et al. 2012). In this study, specificity was measured by the proportion of specific memories and overgeneral memory by the proportion of categoric memories. Omissions have sometimes been included in the denominator when calculating proportions but were excluded here following Debeer et al. (2009) because, as Griffith et al. (2012) pointed out, their meaning is unclear. An omission may mean no memory was retrieved in the time limit or that one was retrieved but, for a variety of reasons, was not reported. Measures of overgeneral memory sometimes include extended memories for events that took place over a period longer than one day (e.g., Williams and Dritschel 1992). They were not included here because they are more like specific memories than general, categoric memories, differing only in lasting longer than one day (Hargus et al. 2010). Like specific memories, extended memories are recalled with autonoetic consciousness, they describe particular events that occurred at specific times and places, and are characterised by the recall of specific details of past experiences.

**Results**

The mean scores for mindfulness (acceptance and presence), depression, and rumination (brooding and reflection) are shown in Table 1 together with the proportion of memories of different types and the mean ratings for each memory characteristic. The mean ratings were

calculated across all memories that were autobiographical whether they were specific, categoric or extended.

Table 1 about here

Pearson's two–tailed correlations were calculated between mindfulness, rumination and depression scores and between each of these scores and the key memory variables: specificity, overgeneral memory and ratings of memory characteristics. To adjust for the possibility of Type 1 errors, only correlations where the effect size *r* exceeded .3 (medium effect) are reported (Cohen 1992). This method was chosen because effect sizes are a more accurate reflection of effects than significance (e.g., Nakagawa 2004; Perneger 1998). The value of $r^2$ x 100 is also reported to indicate the proportion of the variance shared by the two correlated variables.

Higher mindfulness acceptance scores were associated with higher mindfulness presence scores ($r$ = .596, $p$ < .001, $r^2$ = 35.5%) and higher brooding rumination scores were associated with higher reflection rumination scores ($r$ = .533, $p$ < .001, $r^2$ = 28.4%). Higher scores for both mindfulness subscales were associated with lower depression scores (acceptance: $r$ = -.308, $p$ = .01, $r^2$ = 9.5%; presence: $r$ = -.321, $p$ = .007, $r^2$ = 10.3%) and higher scores for both rumination subscales were associated with higher depression scores (brooding: $r$ = .524, $p$ < .001, $r^2$ = 27.5% ; reflection: $r$ = .512, $p$ < .001, $r^2$ = 26.2%) but there was no association between the mindfulness and rumination scores.

Higher mindfulness presence scores were associated with lower memory specificity ($r$ = -.313, $p$ = .008, $r^2$ = 9.8%) and with more positive emotion during recall ($r$ = .393, $p$ = .001, $r^2$ = 15.4%). Higher mindfulness acceptance and presence scores were associated with greater intensity of emotion during recall (acceptance: $r$ = .310, $p$ = .009, $r^2$ = 9.6%; presence: $r$ = .353, $p$ = .003, $r^2$ = 12.5%). There were no associations between depression scores or brooding rumination scores and the memory variables but higher reflection rumination scores

were associated with greater intensity of emotion during recall ($r$ = .320, $p$ = .007, $r^2$ = 10.2%) and with higher ratings of reliving during recall ($r$ = .486, $p$ < .001, $r^2$ = 23.6%).

**Discussion**

As might be expected given the non-clinical sample in this study, most memories recalled in response to the AMT cues were specific memories. The next most common were categoric memories followed by extended memories, with very few semantic associates or omissions. This is similar to the pattern of responses reported by Debeer et al. (2009) who used the same minimal instruction version of the AMT with a non-clinical sample.

Consistent with previous studies (Kohls et al. 2009; Treynor et al. 2003), the presence and acceptance subscales of the FMI mindfulness measure and the brooding and reflection subscales of the RRS rumination measure were positively associated with each other. Higher scores on both FMI subscales were associated with lower depression scores, and higher scores on the two rumination subscales were associated with higher depression scores. These results are consistent with previous research showing the benefits of mindfulness for relieving depression (Kohls et al. 2009) and an association between the tendency to ruminate and depression (Treynor et al. 2003). However, contrary to previous evidence suggesting that mindfulness reduces brooding rumination (e.g., Borders, Earleywine and Jajodia 2010; Deyo, Wilson, Ong and Koopman 2009; Heeren and Philippot 2011; Kingston, Dooley, Bates, Lawlor and Malone 2007), there was no association between mindfulness and rumination scores. This may be because most of this evidence is based on training in *state* mindfulness rather than *trait* mindfulness differences (e.g., Deyo et al. 2009; Heeren and Philippot 2011; Kingston et al. 2007). Although Borders et al. (2010) reported an association with trait mindfulness, they measured mindfulness with the Mindfulness Attention Awareness Scale (Brown and Ryan 2003) and this scale has more in common with measures of attentional cognitive failures than with other measures of trait mindfulness (Cheyne, Carriere and Smilek

2006; Grossman 2011). So it seems that something specific to the skills taught in mindfulness training programmes might be crucial to reducing rumination.

In relation to the main aim of the study, the results showed an association between trait mindfulness and memory specificity. The association was negative; higher trait mindfulness predicted reduced specificity and only presence, not acceptance, was associated with reduced specificity. This is opposite to the association found in studies of the effects of short periods of training in state mindfulness. In these studies specificity either increased following training (Heeren et al. 2009; Williams et al. 2000) or did not show the decrease over time seen in a comparison group (Hargus et al. 2010). The difference in findings may be because only memory *retrieval* processes are likely to be influenced by training in state mindfulness (because memories will have been encoded before the period of training), whereas both *encoding* and *retrieval* processes are likely to be influenced in the case of trait mindfulness. One way in which trait mindfulness might influence encoding and retrieval so that the result is reduced memory specificity is through an influence on an individual's mode of experience and self-awareness.

Two modes of experience can be distinguished. In one there is greater attention to external stimuli in the environment, and in the other attention is focused on internal and self-related stimuli including self-projection into the past, such as during remembering, and self-projection into the future, such as during future planning (Josipovic, Dinstein, Weber and Heeger 2011). These two modes of experience appear to correspond to two competing cortical brain systems; the extrinsic system that responds most to external stimuli and tasks, and the intrinsic system that responds most to internal stimuli and tasks (e.g., Golland et al. 2007; Tian et al. 2007). It has been shown that training in present-focused attention as part of mindfulness training increases the emphasis on the momentary self in preference to the natural bias towards the narrative self (Farb et al. 2007). Self-projections into the past and

self-projections into the future of the kind typical of the narrative form of self-awareness appear to involve the same brain areas in the intrinsic system (Buckner and Carroll 2007). Furthermore, Josipovic et al. (2011) showed that focused attention meditation increases the anti-correlation between the extrinsic and intrinsic brain systems. It thus appears that momentary self-awareness, which increases following mindfulness training, emphasises the extrinsic mode of experiencing whereas narrative self-awareness (the default mode of processing) emphasises the intrinsic mode of experiencing. If people high in trait mindfulness emphasise the extrinsic mode of processing in the same way as those trained in mindfulness skills, then this could influence their memory encoding and retrieval processes in a way that might explain the association between lower specificity and higher trait presence.

Encoding processes are likely to differ depending on whether encoding is from the point of view of momentary or narrative self-awareness. Whereas narrative self-awareness involves the elaboration of mental events, momentary self-awareness requires inhibition of such elaboration so that attention is focused on the present including thoughts, emotions and physical sensations. If greater awareness of the momentary self during encoding in those high in trait presence results in less elaboration of an event as it is experienced, this will result in fewer links to be followed during later retrieval attempts. This is because elaboration is important for making the links between current experience and stored representations in the autobiographical knowledge base that increase the chances of later retrieval in response to cue words (Conway and Pleydell-Pearce 2000). Without secondary elaboration, the focus during encoding would be on the sensory-perceptual experience and the primary emotional experience at the time of the event. Further escalation of the emotional experience through secondary emotional reactions would be less likely in highly mindful individuals resulting in a memory that is harder to retrieve intentionally in response to emotion cue words of the kind used in the AMT. Consistent with this suggestion, Anicha, Ode, Moeller and Robinson

(2012) reported that individuals who scored high in the observing (presence), but not non-reactivity (acceptance), facet of dispositional mindfulness showed greater perceptual abilities in two different perceptual tasks.

Retrieval processes are also likely to be influenced by the preferred mode of self-awareness. Memory retrieval tasks emphasise the intrinsic self-projection system so one might expect a general superiority in autobiographical memory retrieval (including greater specificity) in individuals lower in trait presence who emphasise narrative self-awareness and reduced specificity in those higher in trait presence who emphasise momentary self-awareness. This might be especially true in tasks such as the AMT where cue words and narrative self-reports are used. Thus, memory encoding and retrieval in a state of mind that places more emphasis on momentary self-awareness is likely to reduce the specificity of autobiographical memory recall.

This explanation leaves open the question of why the studies showing an association between short courses of mindfulness training and memory specificity show a *positive* association in contrast to the negative association between trait presence and memory specificity. It could be that in these studies there is more of an influence of training in the skills of acceptance. Such skills are particularly important for the reduction in functional avoidance, capture and rumination, and the increase in executive control that has been suggested to underlie the increase in memory specificity following mindfulness training (e.g., Hargus et al. 2010; Heeren et al. 2009).

As well as specificity, trait mindfulness was related to two other memory characteristics, both of which measure participants' subjective experience during memory recall. Higher scores for trait presence and trait acceptance were associated with greater emotional intensity during recall, and higher presence scores were associated with more positive emotion during recall. This could be because those higher in trait mindfulness are

less likely to avoid the emotions accompanying memory recall allowing for more intense emotions to be felt and, as a result of less resistance, a more positive emotional response during recall. If individuals higher in trait mindfulness emphasise the extrinsic mode of experience, this kind of awareness may allow participants to be more responsive not only to external stimuli but also to their own feelings. The only other significant results were that higher reflection rumination was associated with greater reliving and with more emotional intensity during recall. Reflection rumination is an adaptive form of rumination in which the focus is on problem solving through self-reflection to alleviate negative feelings. Individuals who reported a tendency to reflective rumination when they felt down or depressed had a more intense experience during recall.

Several limitations of this study are acknowledged. One is the reliance on self-report to measure trait mindfulness. To date there is no consensus on a valid psychometric measure of dispositional mindfulness (Anicha et al. 2012). The FMI was used in this study because it is sensitive to variations in meditation experience (Walach et al. 2006). Nevertheless, it has not yet been established whether individuals can reliably report their dispositional mindfulness (Davidson 2010; Grossman 2011; Thompson and Waltz 2007), and the relationship between trait mindfulness and the states of mind fostered through practice in mindfulness meditation is not yet clear. Another limitation is the correlational nature of the study. This means that it cannot provide any direct evidence relating to the underlying processes that may lead to the associations observed. The suggested explanations for the observed associations must therefore remain speculative until they can be investigated further. Nevertheless, the results reported here are important for demonstrating for the first time an association between higher *trait* mindfulness and lower memory specificity.

There are a number of implications of these results. One is that reduced memory specificity need not always be a concern. While it is clearly a concern in clinical populations

where a lack of specificity is associated with depression (e.g., Williams et al. 2007), the results of this study suggest that in a non-clinical population reduced specificity is not associated with depression but with high trait mindfulness which itself is associated with good mental wellbeing (Brown and Ryan 2003). Another implication is the need to pay more attention to the effects of mindfulness on memory *encoding* processes. The focus so far has been on the effects of state mindfulness training on memory *retrieval* processes. The results presented here make clear the need to consider how mindfulness influences encoding as well as retrieval.

Further research is needed to replicate the findings of this study and to further examine the ways in which mindfulness influences memory encoding and retrieval processes, including the effects of different modes of self-reference on memory processing. The proposed explanations for the association between high trait mindfulness and reduced memory specificity need to be tested. One way to test the suggestion that it is an influence on encoding that is important for the association between higher trait mindfulness and reduced specificity would be to measure specificity in those who have developed their mindfulness skills over a long period of sustained meditation practice because they, like those high in trait mindfulness, are likely to encode as well as retrieve their memories in a more mindful state. A similar pattern of reduced memory specificity would thus be predicted in experienced meditators. And if, as suggested, reduced specificity in those higher in trait mindfulness is due to a greater reliance on momentary self-awareness, then reduced specificity would also be predicted during self-projections into the future as well as during projections into the past in memory recall. Another recommendation for future research is that mindfulness measures are included in studies of the effects of training in state mindfulness. Mindfulness presence was associated with reduced specificity in this study of trait mindfulness, and it was suggested that one reason why this effect is opposite to that found in studies of mindfulness

training is that acceptance skills have more of an influence on specificity in mindfulness training studies. However, studies that have reported increased specificity following mindfulness training (Hargus et al. 2010; Heeren et al. 2009; Williams et al. 2000) have not included measures of mindfulness before and after training. It is important to include measures of mindfulness presence and acceptance in future research in order to explore whether it is an increase in presence, acceptance or both that underlies the effect of mindfulness training on memory specificity.

To conclude, this study demonstrates for the first time an association between trait mindfulness and autobiographical memory specificity. It is suggested that the association between lower specificity and higher trait presence might be explained by a greater emphasis in those high in trait mindfulness on the extrinsic mode of processing and a higher degree of momentary self-awareness that influences both the encoding and retrieval of autobiographical memories.

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Table 1

Means and standard deviations for mindfulness, rumination and depression scores, the proportion of memories of different types, and ratings of memory characteristics ($N$ = 70)

| | *M* | *SD* |
|---|---|---|
| Questionnaire measures | | |
| Mindful Acceptance | 19.3 | 4.5 |
| Mindful Presence | 17.3 | 2.8 |
| Depression [a] | 6.7 | 5.0 |
| Brooding Rumination [a] | 11.2 | 3.9 |
| Reflection Rumination [a] | 10.7 | 4.0 |
| Memory type | | |
| Specific memories (specificity) | 0.68 | 0.19 |
| Categoric memories (overgeneral memory) | 0.17 | 0.17 |
| Extended memories | 0.10 | 0.10 |
| Semantic associates | 0.01 | 0.04 |
| Omissions | 0.04 | 0.15 |
| Other responses | 0.04 | 0.06 |
| Characteristics of memory | | |
| Visual detail | 5.0 | 0.9 |
| Emotional intensity at time of event | 5.5 | 0.9 |
| Emotional valence at time of event | 4.0 | 0.6 |
| Characteristics of the recall experience | | |
| Reliving | 3.7 | 1.2 |
| Emotional intensity during recall | 4.0 | 1.2 |

| | | |
|---|---|---|
| Emotional valence during recall | 4.3 | 0.7 |
| Closure | 5.2 | 1.0 |

[a] $n = 69$