A dysphoric's TALE: The relationship between the self-reported functions of

autobiographical memory and symptoms of depression

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Abstract

Autobiographical memory (AM) is believed to serve self, social and directive functions; however, little is known regarding how this triad of functions operates in depression. Using the Thinking About Life Experiences questionnaire (TALE; Bluck & Alea, 2011; Bluck, Alea, Habermas & Rubin, 2005), two studies explored the relationship between depressive symptomology and the self-reported frequency and usefulness of AMs for self, social and directive purposes. Study 1 revealed that thinking more frequently but talking less frequently about past life events was significantly associated with higher depression scores. Recalling past events more frequently to maintain self-continuity was also significantly associated with higher depressive symptomology. However, results from Study 2 indicated that higher levels of depression were also significantly associated with less frequent useful recollections of past life events for self-continuity purposes. Taken together, the findings suggest atypical utilisations of AM to serve self-continuity functions in depression and can be interpreted within the wider context of ruminative thought processes.

Keywords: depression, self-continuity, directive, social, usefulness, reminiscence

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Autobiographical memory (AM) constitutes the memory system containing "facts and

events that have been interpreted and integrated into a consistent story about one's self"

(Buckner & Fivush, 1998, p. 407). Decades of research have explored the structure and

processes involved in AM, yet Baddeley (1988, 2009) argued that the functional purpose of

AM had been, by comparison, relatively ignored. In order to address this issue, researchers

have now adopted a functional approach, focusing on why, rather than what, individuals

remember. As a result, a tri-dimensional model has emerged, which argues that AM serves

self, social and directive functions (e.g. Bluck & Alea, 2002).

Conway (2005) argues that the self function of AM promotes a coherent sense of

identity over time. Recalling memories allows the self to be continually updated whilst

continuity of the self remains intact. Furthermore, AM functions to maintain a positive view

of the self, particularly in situations requiring self change (Robinson, 1986; Wilson & Ross,

2000, 2003). This positivity bias serves the self by enhancing an individual's self-esteem and

regulating emotion (Bluck et al., 2005; Wilson & Ross, 2003). Recalling past memories also

provides knowledge of the self in the past which can be projected in to the future (Neisser,

1988). This ties closely with the directive function of AM, which employs past life

experiences to guide present and future behaviour (Baddeley, 1988; Bluck & Alea, 2002;

Pillemer, 1998). AM is believed to aid problem solving because past events can be used as

analogies for current problematic situations and help to predict future events (Baddeley,

1987; Williams, 1996, 2006). Pillemer (1998) argues that memories are linked to future

wellbeing through their persistent reminders of what is worth pursuing and what should be

avoided. Finally, AM is also argued to serve a social function. Recalling and sharing past

experiences is widely believed to develop, maintain and enhance social relationships (Alea &

Bluck, 2003; Cohen, 1998; Neisser, 1988; Nelson, 1993; Pillemer, 1998). For example, it is thought that sharing past experiences can aid the development of intimacy in relationships, by increasing feelings of closeness and promoting responsiveness (Alea & Bluck, 2007; Cohen, 1998).

In order to empirically investigate the functionality of AM, the Thinking about Life Experiences Scale (TALE; Bluck & Alea, 2011; Bluck, Alea, Habermas, & Rubin, 2005) and the Reminiscence Function Scale (RFS; Webster, 1993) were developed. Both represent self-report inventories that ask participants to rate the frequency with which they think back and talk about past life events across a variety of contexts. However, only the TALE directly maps onto the tri-dimensional functional model of AM. Previous research utilising the TALE has investigated whether the functions of AM differ across key variables such as culture, life phase and gender. For instance, research suggests that younger adults report recalling past events to serve the self and directive functions significantly more than older adults (Bluck & Alea, 2009; Wolf & Zimprich, in press). Arguably, this finding reflects a greater need to develop self concept, self-continuity and direct future plans in younger, compared with older, adulthood.

Theories of AM suggest recalling past events serves adaptive functions; therefore, it is perhaps surprising that limited research has explicitly examined the relationship between functional usage of AM and psychological wellbeing. Arguably, one would expect that individuals who frequently use their AM to serve self, social and directive functions would report higher levels of psychological wellbeing. Two recent studies have evidenced support for this notion. Alea and Bluck (2013) found a positive association between recall for meaning making (searching for meaning and directing behaviour) and two measures of well-being, positive affect and optimistic future time perspective. Additionally, Waters (2014) found that individuals who recall past events to serve self, social and directive functions

report higher levels of purpose, communication and more positive relationships. These positive associations are supported by findings from the reminiscence literature using the Reminiscence Function Scale (e.g. Cappeliez & O'Rourke, 2006; Cappeliez, O'Rourke & Chaudhury, 2005; O'Rourke, Cappeliez & Claxton, 2011). For instance, Cappeliez and O'Rourke (2006) found that positive self-reminiscence functions (such as identity, death preparation and problem solving) were positively associated with wellbeing in older adults.

If AM serves adaptive functions that positively impact on psychological wellbeing then it follows that difficulties using AM for functional purposes may be implicated in psychological distress. To date, however, there is limited knowledge in this area. Alea and Bluck (2013) failed to find a relationship between meaning making and negative affect. However, their study used a measure of momentary affect; it is feasible that biases in AM function may be more evident in individuals experiencing enduring symptoms of emotional distress. Therefore, it is important to establish how the self, social and directive functions of AM operate in individuals experiencing emotional distress, such as depression. To date, no research has explicitly investigated this.

Whilst research has yet to explore the tri-dimensional model of AM functionality in depression, there is some experimental evidence that supports the notion of atypical AM utilisation. This work has, to date, primarily focused on the directive function of AM. Reduced memory specificity, a commonly found bias within depressed and dysphoric samples (see Williams et al, 2007 for a review), has been theorised to impact on problem-solving ability. It is argued that reduced access to specific events within AM (episodes lasting less than one day) results in the individual having fewer analogies from which to develop problem solving strategies. This link between AM and problem-solving has been evidenced by a study showing that experimental manipulation of memory specificity directly impacts on performance in a hypothetical problem-solving task (Williams et al., 2006). Furthermore,

numerous studies have shown that depressed and dysphoric individuals exhibit impaired problem-solving ability (e.g. Anderson, Goddard & Powell, 2009; Goddard, Dritschel, & Burton, 1996; Nezu & Ronan, 1985).

Preliminary experimental evidence indicates that the self functions of AM may also operate differently in depression. Bluck and colleagues (2005) proposed that one important aspect of the self function is to regulate emotion. Research has indicated that a negative mood can be repaired by the recall of positive events (Parrott & Sabini, 1990). However, the same mood regulatory function is not seen in individuals with depression and dysphoria. When asked to recall positive memories to repair mood, dysphoric and depressed individuals showed no improvement or a worsening in mood respectively (Joormann & Siemer, 2004; Joormann, Siemer, & Gotlib, 2007). Thus, it appears that depressed individuals exhibit an impaired ability to regulate their mood through the mechanisms of positive recollections. Overgeneral memory may also be implicated in these impaired mood regulatory processes as evidence suggests that reduced memory specificity is associated with repressive and defensive mechanisms to regulate negative affect (Williams, Eelen, Raes & Hermans, 2006).

Thus, to summarise, there is evidence to suggest altered functioning of AM in depression, with both directive and emotional regulatory processes implicated. However, research has yet to directly explore how the tri-dimensional model of AM relates to depressive symptomatology. Given the pervasive nature of negativity and biased cognition within depression, it is reasonable to suggest that biases may extend across all aspects of AM function. Existing research suggests that depressed individuals evidence biases in how they view themselves and their interactions with others. For instance, Beck's cognitive model of depression proposes a triad of negativity with respect to views of the self, world and future (Beck, 1967, 1983, 1987). Furthermore, research has suggested that individuals experiencing high levels of depressive symptomatology report less rewarding social interactions (Nezlek,

Imbrie, & Shean, 1994). Thus, given the tri-dimensional model of AM function, it is feasible that these reported biases in self-perception and social interaction may be caused or maintained by altered patterns of AM usage.

We present two studies that assess the relationship between depressive symptomology and the self-reported functions of AM. Study 1 uses the conventional version of the TALE questionnaire (Bluck & Alea, 2011; Bluck et al., 2005) to ascertain self-reported frequency of functional AM usage and the Center for Epidemiological Studies Depression Scale – Revised (CESD-R; Eaton, Mutaner, Smith, Tien, & Ybarra, 2004) as a measure of current depressive symptoms. This study will establish whether differences in the functional utilisation of AM are associated with levels of depression severity, after controlling for any differences in overall frequency of thinking/talking about past events. Previous findings suggest that thinking/talking about AMs, for the purposes of self, social and directive functions, is positively associated with psychological well-being (e.g. Alea & Bluck, 2013; Waters, 2014). Thus, it is hypothesised that higher levels of thinking/talking about past life events for functional purposes will be associated with lower levels of depressive symptoms.

Study 1

Method

Participants. Eighty-eight undergraduates (15 males) from the University of Hull participated in return for course credits. The sample ranged in age from 18 to 39 years old ($M = 19.77$ years, $SD = 3.06$). None of the participants were currently undergoing, or had previously received, treatment for depression. This was established prior to participation through a short screening questionnaire via email. All participants provided informed consent before completing the study which had been granted ethical approval from the University of Hull Psychology Department Ethics Committee.

Materials.

Centre for Epidemiological Studies Depression Scale-Revised (CESD-R). The CESD-R (Eaton et al., 2004) is a brief screening tool for depression that constitutes a revision of the CES-D (Radloff, 1977). It is designed to measure depressive symptomology in the general population using twenty self-report items. Each item measures symptomatology across the nine different clusters specified by the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013): sadness/dysphoria; loss of interest/anhedonia; appetite; sleep; thinking/concentration; guilt/worthlessness, fatigue, movement/agitation; suicide ideation. Participants are asked to rate how frequently they experience each symptom using a 5-point Likert scale ranging from '*not at all*' to '*everyday for two weeks*'; responses are scored 0-4, with a potential maximum severity score of 80.

Thinking about Life Experiences Scale (TALE). The TALE (Bluck & Alea, 2011; Bluck et al., 2005) is a fifteen item self-report inventory that assesses the three functions of AM: self-continuity, social-bonding and directing-behaviour. The self-continuity subscale explores the frequency that individuals think and talk about past events to examine whether their sense of self has remained consistent over time. The social bonding subscale assesses the extent to which individuals use past memories to aid the development and maintenance of social bonds, while the directing-behaviour subscale examines the frequency with which individuals use memory to guide present and future thought and behaviour. The questionnaire begins by asking participants to rate how frequently, in general, they think and talk about past life events using a 5-point Likert scale ranging from '*almost never*' (scored 1) to '*very frequently*' (scored 5); these two items provide a baseline measure of the frequency that the individual reminiscences. Using the same 5-point scale, participants are then asked to rate how frequently they think/talk about past life events across fifteen different scenarios.

Five items correspond to each of the three subscales (self, social and directive); examples of items include '*when I want to feel that I am the same person that I was before*' (self), '*when I believe that thinking about my past can help guide my future*' (directive) and '*when I want to develop intimacy in a relationship*' (social). Although each subscale score ranged from 5-25, mean scores were utilised in the analysis.

Procedure. Participants were told that the study was an investigation into the functions served by recalling events from our own personal past and provided informed consent prior to completion. After providing demographic information (age and gender) participants completed the CESD-R and the TALE. Participants were tested in groups (maximum of 5) at individual work stations in a laboratory setting. The overall testing time of the study was approximately 15 minutes and the researcher was present at all times.

Results

Mean scores for each variable, along with correlations between variables, are presented in Table 1. Hierarchical multiple regression analysis was employed to investigate the relationship between depressive symptoms and the frequency that past life events are recalled to serve the self, social and directive functions (Table 2). To control for any variation in overall frequency of thinking/talking about the past, responses on the TALE's two baseline questions of thinking and talking about the past were entered during step one of the analysis. This model was significant, $F(2, 85) = 8.74$, $p < .001$, accounting for 17% of the total variance in depressive symptoms. Higher levels of depressive symptoms were predicted by increased frequency in thinking about past events, $t(85) = 3.98$, $p < .001$, and, conversely, reduced frequency of talking about past events, $t(85) = -1.99$, $p < .05$.

In step two of the analysis, frequency of thinking/talking about past life events to serve self, social and directive functions were added to the model. This added significant predictive validity to the model, $F(5,82) = 5.59$, $p < .001$, accounting for a further 8% of the

variation in depressive symptoms. The frequency that events are recalled to serve self-continuity purposes predicted depressive symptoms, $t(82) = 2.86$, $p < .05$; higher levels of depressive symptomatology were associated with increased thinking/talking about past events for the purposes of self-continuity. The frequency with which past life events were recalled to serve social and directive functions of AM made no significant contributions to the model.

Discussion

The present study is the first to directly investigate the relationship between depressive symptomology and the functional utilisations of AMs for self, social and directive purposes. Results revealed that depressive symptomology was associated with frequency of thinking and frequency of talking about past life events. Higher scores of depression were associated with increased thinking about, but decreased talking about, past events. Furthermore, the frequency with which past life events were recalled to serve self-continuity functions was significantly related to depression scores, above and beyond participants' general tendency to think/talk about past events. Higher levels of depression were related to more frequent recollections for self-continuity purposes. These findings are contrary to our hypothesis that more frequent functional utilisations of AMs would be associated with lower levels of depressive symptomatology. Our predictions were derived from the functional model of AM. This model argues that AM serves an adaptive purpose and, therefore, thinking/talking more frequently about past events to fulfil these functions would be positively associated with wellbeing. Our findings suggest a more complex picture. Taken together with the previous literature (e.g. Alea & Bluck, 2013; Waters, 2014) it appears that frequency of thinking/talking about past events for functional purposes can be seen in individuals reporting higher levels of subjective well-being *and* in individuals experiencing symptoms of psychological distress.

The characteristic features of dysphoria, particularly a tendency to ruminate, may go some way to explaining the current findings. Dysphoric rumination constitutes repetitive self-focused thinking regarding symptoms of distress and their potential causes and consequences (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008); it is thought to contribute to the maintenance of depressive symptoms (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, 2000).Therefore, the higher frequency of thinking about past events, particularly with respect to self continuity, may reflect the ruminative thought processes that often accompany feelings of dysphoria. However, knowledge regarding the valence of recollections would be necessary to confirm this proposition as rumination is defined by repeated recall of negative events. It is feasible that the potential presence of intrusive memories could also help explain our findings. Intrusive memories are vivid and distressing recollections that come to mind involuntarily and are a commonly cited cognitive characteristic of depression (Brewin, Hunter, Carroll & Tata, 1996; Kuyken & Brewin, 1994). Intrusive memories and the avoidance of these intrusions have been found to predict the course of depression (Brewin, 1998). Such intrusions are of particular relevance to the present findings as involuntary AMs are theorised to serve self-continuity functions (Rasmussen & Berntsen, 2009). Furthermore, intrusive memories, particularly of negative AMs, are associated with self-focused rumination (Starr & Moulds, 2006; Williams & Moulds, 2007).

Taken together with the literature on rumination and mental intrusions, the present findings suggest that, if we are to gain a complete understanding of AM functionality in depression, measuring only the frequency of functional recollections is insufficient. The evidence currently suggests that frequency of AM recall is positively associated with measures of wellbeing and measures of psychological distress. This raises the question, do individuals experiencing high levels of depressive symptoms recall AMs more frequently in an attempt to serve an adaptive function or do they get stuck in ruminative processes that are

non-adaptive? In an attempt to better understand why individuals experiencing high levels of depressive symptoms recall past events more frequently, we need to consider the perceived *usefulness* of thinking/talking about past events in relation to the self, social and directive functions. More insight may be gained from asking participants to report how frequently they find their AMs serve useful functions. Moreover, such a measure will provide important information regarding the metacognitive processes underlying AM utilisation.

Whilst experimental work is limited, it does suggest that depression may be associated with difficulties with the functional utilisations of AMs (Joorman & Siemer, 2004; Joorman et al, 2007; Williams et al, 2006). However, at this point in time, it is not clear whether individuals are aware of these difficulties. For instance, individuals with depression may think that AMs are less useful for directing future behaviour. This would support experimental work suggesting biases in the directive function of AM and suggest a metacognitive awareness of these difficulties. Alternatively, depressed individuals may be unaware of these difficulties. This, in turn, could serve to maintain functional biases and low mood, as they continue to try and use AMs for directive purposes with limited success. Furthermore, data on the metacognitive beliefs about the usefulness of AM may elucidate further on the findings of Study 1. For instance, depressed individuals may think that AMs are rarely helpful for the purposes of self-continuity; this, together with the high frequency of recall for self purposes reported within Study 1, would suggest that they realise the process is dysfunctional but find it very difficult to control. Alternatively, depressed individuals may believe that recalling past events is useful for the purposes of self-continuity and, in turn, this lack of awareness may justify continued ruminative thought processes.

Therefore, the aim of Study 2 is to assess the relationship between depressive symptomology and the perceived usefulness of recalling past events to serve the self-reported functions of AM. In particular, we examine whether depressive symptomology is

significantly associated with the reported frequency of useful recollections of past life events to serve self, social and directive functions of AM. Experimental evidence suggests that depression may be associated with less functional use of AMs. Participants with high levels of depression may be aware of these difficulties and, therefore, a significant association between higher levels of depression and less frequent useful recollections of AMs for functional purposes will emerge. Alternatively, participant with high levels of depression may be unaware of any difficulties in AM utilisation and, consequently, frequency of useful recollections of AMs for functional purposes will not be significantly associated with depression.

Study 2

Method

    Participants. Recruitment procedures and inclusion criteria remained identical to Study 1. The sample consisted of 72 participants (23 males) aged 18 to 29 years old ($M =$ 19.84 years, $SD = 2.88$).

    Materials & Procedure. The procedure was identical to Study 1, with one exception. The TALE questionnaire (Bluck & Alea, 2011; Bluck et al., 2005) was modified to measure frequency of *useful* AM recall, rather than frequency of recall. Two questions established a baseline measure of usefulness by asking participants to rate how frequently they find it useful to think and talk about past events. To assess usefulness across the three subscales (self, social and directive), participants were then asked to rate how frequently they find it useful to think/talk about past events across the same fifteen scenarios used in the conventional TALE. All ratings were provided using the same 5-point Likert response scale as in Study 1, ranging from *almost never* (scored 1) to *very frequently* (scored 5). Thus, two

baseline ratings ranging from 0-5 (think and talk) and three subscale scores ranging from 5-25 (self, social and directive) were obtained; higher scores represent greater frequency of AM usage that is perceived to be useful. Again, mean scale scores were utilised in the analysis.

Results

The mean scores for each variable, along with the correlations between variables, are displayed in Table 3. Hierarchical multiple regression analysis was utilised to investigate the relationship between depressive symptoms and the frequency with which individuals perceive it to be useful to recall past events to serve self, social and directive functions (Table 4). In order to control for any differences in the overall frequency of thinking/talking about the past, response on the TALE's two baseline questions of thinking and talking about the past were entered during step one of the analysis. The model at step one was significant, $F(2, 69) = 3.48$, $p < 0.5$, accounting for 9% of the total variance in depressive symptoms. Higher levels of depressive symptomology were predicted by reduced frequency of useful talking about past life events, $t(69) = -2.30$, $p < .05$.

In step two of the analysis, the frequency of thinking/talking about past life events to serve self, social and directive functions of AM were added to the model. The addition of these three variables added significant predictive value to the model, $F(5, 66) = 2.96$, $p < .05$, accounting for a further 9% of the variance in depression scores. Depressive symptomology was significantly predicted by the frequency of useful recollections for the purposes of self-continuity, $t(66) = -2.41$, $p < .05$. More specifically, higher levels of depressive symptoms were associated with less frequent useful recollections to serve self-continuity purposes. The self-reported frequency with which individuals perceived it to be useful to recall events for social and directive functions made no significant contributions to the model.

Discussion

Study 2 suggests that higher levels of depressive symptoms were associated with less frequent useful instances of talking about past life events. Furthermore, when looking at the self-continuity function of AM, findings indicated that less frequent useful recollections were evident in individuals reporting higher levels of depressive symptoms. Thus, these findings suggest that individuals experiencing high levels of depressive symptoms find talking about their past experiences useful less frequently. Furthermore, the frequency with which they perceive that their thoughts about self-continuity and identity are useful is reduced. This finding is in line with work that has found the self functions of AM, such as mood regulation, to be impaired in dysphoric samples (Joorman & Siemer, 2004; Joorman, Siemer & Gotlib, 2007).

The present study failed to find a significant relationship between depressive symptomology and the perceived usefulness of recalling past events to serve social-bonding and directive functions of AM. Experimental research suggests impairments in the directive function of AM in depression. For example, overgeneral AM in depression is a robust finding (Williams, 2007) that has been linked with poor problem-solving (Williams et al, 2006). It would therefore appear that individuals with high levels of depressive symptoms lack an awareness of their impairments in utilising past memories to effectively solve problems and direct present and future thought and behaviour.

To conclude, the findings from Study 2 suggest that higher levels of depressive symptoms are associated with perceiving it to be less useful to talk about events from the past. Furthermore, higher levels of depression are also associated with reduced frequency of useful recollections of past life events to maintain a coherent sense of identity. It is, however, important to remember that these findings reflect self-reported perceptions and metacognitive beliefs about the functional utilisations of AMs. It is possible that a different pattern of results may have emerged if we were able to collect a more objective measure of the usefulness of

AM utilisations. A different pattern of results may also have emerged if participants were asked to rate *how* useful they find it to look back over past to serve functions of AM. This issue could be addressed in future research.

General Discussion

The studies presented here investigated the relationship between AM function and psychological distress. In particular, we investigated the relationship between depressive symptomology and the functional utilisations of AM for the purpose of self-continuity, social bonding and directing current/future behaviour. In both studies participants provided frequency ratings in response to two baseline questions; these questions examined whether, in general, there were differences in the frequency with which individuals think and talk about past events (Study 1) and the frequency with which they find it useful to do so (Study 2). Findings suggest that higher levels of depressive symptoms were associated with an increased frequency of thinking about, but a decreased frequency of talking about, past life events. Furthermore, individuals with higher levels of depressive symptomology perceived talking about past life events to be useful less frequently.

The present studies also indicated that higher levels of depression were associated with more frequent recall for self-continuity purposes (Study 1). Taken together with the previous literature examining the functionality of AM (e.g. Alea & Bluck, 2013; Waters, 2014), it appears that higher frequency of thinking/talking about past life events is evident in individuals reporting higher levels of subjective wellbeing and in individuals experiencing symptoms of psychological distress. The finding that low mood is associated with both a general increase in thoughts surrounding past events and increased thinking/talking about events for the purposes of self-continuity is, perhaps, unsurprising. Rumination, a characteristic feature of dysphoric mood, involves repetitive negative thoughts surrounding

causes/consequences of past events, along with self-focused analysis of one's self and one's symptoms (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008).

Most interestingly, however, we found that higher scores of depression were also associated with less frequent useful recollections for self-continuity purposes (Study 2). Thus, the two studies together, suggest that individuals experiencing dysphoria have more self-focused thoughts, but believe that their higher levels of self-focused AM recall may not be entirely beneficial. Arguably, they may think more frequently about past events related to the self, not because they find it useful but because the process is difficult to control. This notion is supported by previous research documenting the negative beliefs associated with dysphoric rumination, such as concerns over its uncontrollability along with negative interpersonal and social consequences (Papageorgiou & Wells, 2001). Watkins and Baracaia (2001) found that over 98% of depressed individuals in their study reported serious disadvantages to rumination, yet many also perceived there to be multiple benefits. These positive perceptions are linked to using rumination as a coping strategy to deal with stress (Papageorgiou & Wells, 2001) and perceiving the rumination to increase self-awareness, increase understanding of the depression and help to prevent future problems (Watkins & Baracaia, 2001). The Self-Regulatory Executive Function (S-REF) model (Wells & Matthews, 1994, 1996) accounts for the maintenance of repetitive thought processes and their consequences in individuals with emotional disorders. The model suggests that whether an individual ruminates in response to stress is partially determined by their beliefs regarding the usefulness of rumination. For example, it has been documented that individuals with high levels of positive beliefs regarding rumination report more frequent rumination compared to participants with low levels of positive beliefs (Moulds, Yap, Kerr, Williams & Kandris, 2010). Such perceptions may help to maintain the increased frequency of self-focused thought. Thus, it is argued that

individuals in dysphoric mood may start to ruminate because it serves a useful purpose, but despite realising that it is often unhelpful, find the process very difficult to inhibit.

Alternatively, individuals with high levels of depressive symptoms may exhibit increased recall of past events for self-continuity functions to serve adaptive purposes. It is argued that AM operates to promote a coherent sense of identity over time (Conway, 2005), maintain a positive view of the self (Robinson, 1986; Wilson &Ross, 2003) and regulate emotion (Bluck et al., 2005). Recent work by Diehl and Hay (2011) suggests that depressive symptoms and negative affect are associated with fragmented and confused self-representations. In addition, evidence also suggests that depressed individuals exhibit self discrepancies between their actual and ideal self (Strauman, 1998). Thus, the higher frequency of AM usage may represent attempts to reconcile and repair self-representations. However, it appears that these thought processes may not be effective in providing the desired reconciliation. This may, arguably, be due to a focus on negative content, the abstractness of the thought processes, and/or the fact that limited executive resources make it difficult to control such thoughts. For example, the S-REF model proposes that ruminative processes may be problematic for the self. Engaging in ruminative cycles drains the processing resources necessary for disconfirming functional self-beliefs and restructuring self-knowledge (Wells & Mathews 1994, 1996). However, what is not clear from the present findings is the causal relationship between these different factors. Does dysfunctional utilisation of AM for the purposes of self-regulation accompany depressed mood? Alternatively, does it precede depressive symptoms, serving as a cognitive bias that might make an individual more vulnerable to depression? Further research, using longitudinal designs, would help to elucidate on these issues.

The studies presented here also uncovered interesting findings with respect to the directive functions of AM in depression. Depressive symptomology was not associated with

the frequency with which individuals recalled events (Study 1) or the frequency of perceived useful recollections of past events (Study 2) to direct behaviour. The lack of significant associations between depression and functional utilisations of AM for directive purposes is, perhaps, surprising given the experimental work within this domain. It is possible that the use of dysphoric, rather than clinically depressed, participants in the current study could explain this finding. Previous research has suggested that both overgeneral memory and social problem-solving biases may be more subtle in dysphoria (Anderson et al, 2009; Raes et al, 2007). For instance, Anderson et al (2009) found that dysphoric students were able to generate effective strategies in response to hypothetical problems, yet struggled with implementation of strategies in response to their real-life problems. This is in contrast to literature examining problem-solving in clinical depression, where individuals have difficulty generating effective solutions to hypothetical scenarios (e.g. Goddard et al, 1996). Thus, it is feasible that dysphoric participants do not use memories less frequently, or find them less useful, for the purposes of *planning* future behaviours. However, they may exhibit difficulties in future-directed behaviours for other reasons, such as difficulties in behavioural implementation, which could exacerbate depressogenic thinking and low mood. These proposals are tentative and would need to be explored by future research using the TALE in clinical depression.

With regards to the social function, our investigation was primarily exploratory. Very little work has investigated the use of AM to support social interaction with, to our knowledge, no research looking specifically at depression. Previous literature has suggested that depression is associated with less rewarding social interactions (Nezlek et al, 1994). On this basis, we predicted that higher levels of depressive symptoms would be associated with fewer recollections and less frequent useful recollections of past events so serve the social functions of AM. We also predicted that higher levels of depression would be associated

with less frequent useful recollections for these social functions. However, these predictions were not supported. Thus, the reported difficulties in social interaction reported in Nezlek et al (1994) might arise through other mechanisms; future research would need to explore this possibility. It is also possible that difficulties in the functional utilisation of AMs for social-bonding purposes may have arisen if a clinically depressed sample had been utilised. Therefore, future research is necessary to extend the present findings.

The research presented here explores self-reported functions of recalling past events. The findings, therefore, have limitations inherent in any self-report measure. As Bluck et al (2005) acknowledged, the TALE questionnaire only measures conscious uses of recalling past events. It is unable to measure the unconscious functions that those memories may simultaneously serve. Furthermore, the questionnaire relies on participants' ability to accurately estimate how frequently they recall events for a specific purpose (Pillemer, 2009). The use of a self-report measure is also only able to provide insight into perceptions and metacognitive beliefs, regarding the functionality of AM, rather than reflecting the actual functionality of AM. However, these beliefs are of interest in their own right because they may influence how an individual behaves in situations that require the functional use of AM.

A further limitation of the study is that the findings are drawn from a young adult sample. Other literature demonstrates that the functional utilisations of AM may differ in response to age (Bluck & Alea, 2009). Thus, our results, cannot reliably be generalised to older adult samples. In addition, if the studies were to be replicated, an equal gender distribution should be attained as the sample utilised in the current studies are largely dominated by female participants. Further studies would also benefit from measures of rumination and intrusions. These would allow us to determine whether the present findings simply reflect the presence of dysphoric rumination or whether rumination and the perceived function of AM present independent relationships with depression.

The studies presented here provide the first insight into these processes within individuals experiencing depressive symptoms and pose a number of questions that need to be explored in future research. Firstly, it would be of interest to establish whether diagnostic status impacts upon the functional role of AM. Secondly, longitudinal studies could begin to tease apart the relationship between AM functionality and depression; do biases exist as antecedents, concomitants or consequences of depressive symptomatology? Finally, it has been suggested that the functions served by AM recall could depend on the valence of the memories recalled, with negative memories supporting directive functions and positive memories facilitating self-continuity and social bonding (Rasmussen & Berntsen, 2009). Although the present studies indicate increased frequency of recalling past events to serve self-continuity functions to associated with higher levels of depression, we do not know the valence of the memories being recalled. Given that depressed individuals often exhibit a negativity bias with respect to AM recall (e.g. Lloyd & Lishman, 1975), it could be possible that dysphoric individuals are recalling negative past events more frequently than positive events, which is maintaining a negative sense of self. Future research should therefore explore whether differences exist in the reported frequency with which depressed and non-depressed individuals use positive and negative memories to serve the self, social and directive functions of autobiographical memory.

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