Running head: DEPRESSION MEMORY SPECIFICITY

Depression diagnoses, but not individual differences in depression symptoms, are associated with reduced autobiographical memory specificity

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Abstract

Objectives

Difficulties recalling specific events from one's autobiographical past have been associated with a range of emotional disorders. We present the first examination of whether diagnoses of depression or individual differences in depression severity explain the most variance in autobiographical memory specificity. We also examine the contribution of other key cognitive factors associated with reduced memory specificity – rumination and verbal fluency – to these effects.

Methods

Participants with (*n*=21) and without (*n*=25) Major Depressive Disorder completed self-report measures of depression severity (Beck Depression Inventory Version II; BDI-II) and ruminative tendency (Ruminative Response Scale; RRS), a measure of verbal fluency, and the Autobiographical Memory Test (AMT) to assess memory specificity.

Results

People diagnosed with depression recalled significantly fewer specific memories in the AMT relative to healthy controls. In a linear regression, diagnostic status explained a significant amount of unique variance in specificity whereas BDI-II scores did not. Diagnostic group differences in verbal fluency also explained a significant amount of variance in specificity.

Conclusions

Our findings extend our understanding of the mechanisms involved in reduced memory specificity but future research must explore the causal contribution of weak executive functioning to reduced memory specificity.

Practitioners points

- Diagnoses of depression were associated with problems recalling specific events from one's past.
- Problems with memory specificity amongst depressed people were associated with executive functioning difficulties.
- Problems with specificity were not associated with individual differences in depression severity or ruminative tendencies.

Introduction

For three decades now, studies have examined the extent to which difficulties recalling specific events from one's past, or *reduced autobiographical memory specificity* (rAMS), are associated with emotional disorders. For people with rAMS, when asked to recall a memory associated with a particular cue (e.g., *friends*), rather than recall a specific instance from their past (e.g., *when we went to the cinema on Friday*) they may instead recall semantically associated words (e.g., *fun*) or categories of events (e.g, *hanging out*) or events that extended across long periods of time (e.g., *being in school together*).

The majority of studies in this area have focused on the relation between depression and rAMS. Williams et al. (2007) suggest that problems with specificity may be unique to disorders that are characterised by depressive symptoms. rAMS is typically quantified in terms of the number of specific memories, or those involving events lasting 24 hours or less, recalled in response to several cue words. From a longitudinal perspective, reduced recall of specific memories has been found to predict increases in depressive symptoms over time amongst never depressed people (van Minnen, Wessel, Verhaak, & Smeenk, 2005), currently depressed people (Sumner, Griffith, & Mineka, 2010) and also those in remission (Mackinger, Pachinger, Leibetseder, & Fartacek, 2000; Wessel, Meeren, Peeters, Arntz, & Merckelbach, 2001). From a cross-sectional perspective, although the relation between diagnoses of depression and rAMS has been replicated many times, it is less clear whether individual differences in depression severity across depressed and healthy people also corresponds with differences in rAMS.

Several recent studies involving nonclinical samples did not find any association between self-reported depressive symptoms and rAMS (Barry, Takano, Boddez, & Raes, 2018; Smets, Griffith, Wessel, Walschaerts, & Raes, 2013; Takano, Gutenbrunner, Martens, Salmon, & Raes, 2018). Raes et al. (2007) also reported several unpublished analyses of non-

significant correlations and even significant correlation in the opposite direction than would be expected. In their meta-analysis of differences in specificity between clinical and nonclinical groups, Van Vreeswijk and De Wilde (2004) remarked that differences in specificity between these groups do not always correspond to between-group differences in depression severity. The present study examines whether diagnostic status measured categorically or depression severity measured continuously explains the most variance in individual differences in memory specificity in depressed and non-depressed people.

One reason for the association between depression and rAMS may be due to the presence of other cognitive factors known to be involved in the retrieval of autobiographical memories and which can cause rAMS, and which have also been associated with depression. In particular, there is evidence of a causal association between the tendency to repetitively think in a negative and abstract manner (e.g., 'why is this happening to me?', i.e. *rumination*), and rAMS (Sumner, 2012). People who are induced to ruminate have been found to become less specific post-induction relative to distraction conditions or inductions that encourage people to think in a less abstract or non-ruminative manner (Crane, Barnhofer, Visser, Nightingale, & Williams, 2007; Debeer, Hermans, & Raes, 2009; Raes et al., 2006; Raes, Watkins, Williams, & Hermans, 2008; Sutherland & Bryant, 2007). There is also evidence that deficits in aspects of executive functioning such as working memory, inhibitory control and verbal fluency can contribute towards rAMS (Sumner, 2012). Studies which induce executive impairments by making participants complete a cognitively taxing task whilst recalling autobiographical memories, have observed a concomittant reduction in specificity (Neshat-Doost, Dalgleish, & Golden, 2008; Rutherford, 2009). In addition, separate studies have shown that improvements in rumination (Raes, Williams, & Hermans, 2009) and executive functioning, operationalised in terms of verbal fluency (Heeren, Van Broeck, & Philippot, 2009) correlate with improvements in memory specificity over time.

Among the few studies that have simultaneously examined the contribution of rumination and executive functioning to memory specificity (Barnhofer, Crane, Spinhoven, & Williams, 2007; Raes et al., 2006; Sumner et al., 2014; Sumner, Griffith, & Mineka, 2011) only two have examined the unique contribution of these variables to rAMS. Sumner et al. (Sumner et al., 2014, 2011) found that both self-reported ruminative tendencies and impaired verbal fluency predicted unique variance in specificity amongst healthy undergradutes and young adults from the community with and without a history of MDD. No study has yet examined the contribution of depression status or symptom severity to these effects across currently depressed and healthy participants. This is particularly important given that both heightened ruminative tendencies (Nolen-Hoeksema, 2000) and executive functioning impairments (Snyder, 2014) have consistently been associated with depression.

Therefore, in addition to our examination of the association between depression status and severity and rAMS amongst depressed and healthy people, the present study also examined the contribution of differences in rumination and executive functioning to rAMS. In line with other studies (Sumner et al., 2014, 2011) we operationalised these variables in terms of self-reported rumination (measured using the Ruminative Response Scale; RRS; Nolen-Hoeksema & Morrow, 1991) and verbal fluency. Verbal fluency is a broad measure of executive functioning that relies upon different executive processes. Typical verbal fluency tests ask participants to generate nouns beginning with a given letter (e.g., words beginning with *N*), with more generated words being indicative of stronger verbal fluency. Performance in this task requires participants to initiate and maintain a search of semantic memory whilst maintaining the test instructions and the retrieved words in working memory and inhibiting inappropriate responses (e.g., repetitions or words with other letters). In the present study, we expected that depressed people would show reduced specificity relative to healthy controls and that this would be explained by between-group differences in rumination and verbal

fluency. Given the wealth of evidence in support of differences between depressed and non-depressed people in their memory specificity and the somewhat mixed findings regarding the association between depression severity and memory specificity, we hypothesised that diagnostic status would be associated with memory specificity but not individual differences in self-reported depression severity.

Method

Participants

Participants (N = 46) were 21 people diagnosed with Major Depressive Disorder (MDD) and 25 healthy matched controls, free from diagnoses (See Table 1 for participant characteristics). Control participants were volunteers who responded to local advertisements for psychological research participants. Depressed participants were recruited in consultation with the Department of Anxiety and Depression in St. Pieter's University Hospital, Leuven, the Depression unit in Asster Sint-Truiden and the Department of Depression and Personality Disorders in St. Alexius Hospital, Grimbergen, Belgium. Participants were excluded from the study if they met a diagnosis of bipolar disorder.

Within the depressed group, 14 participants (66.6%) were receiving inpatient care, the mean duration of depressive symptoms was 14.93 months (SD = 16.07) and only one participant was *not* receiving medication for their depression (Selective Serotonin Reuptake Inhibitors (SSRIs: n = 10 (47.6%)), Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs; n = 5 (23.8%)) or atypical anti-depressants (n = 13 (61.9%)). Regarding comorbid diagnoses, one participant had panic disorder (4.8%), one had generalized anxiety disorder (4.8%), two had PTSD (9.5%), three had substance dependence (14.3%), and four had personality disorders (19.1%). Ten participants had no comorbid diagnoses (47.6%).

Materials

Autobiographical Memory Test (AMT)

The AMT (Williams & Broadbent, 1986) was used as a measure of memory specificity. The test contained five positive and five negative cue words (happy, sad, safe, evil, interested, awkward, successful, emotionally hurt, surprised and lonely). Participants were given 60 seconds to recall a specific memory for each cue. Verbal responses were transcribed, and one of the authors scored memories either as specific (unique events that took place within a single day and were more than seven days old) or non-specific. Individual differences in specificity were operationalised as the proportion of specific memories recalled relative to the total number of cue words. To check the reliability of the AMT codes, the senior author scored a random sample of 50% of the AMT responses. Interrater reliability for the categorization of specific versus nonspecific responses was in the substantial range (K = .67)(McHugh, 2012).

Verbal fluency

Individual differences in verbal fluency were assessed by asking participants to generate as many words beginning with the letters *N*, *A* and K in one minute. Participants were told that repetitions, proper nouns (e.g., place names) and words of the same origin (e.g., swim and swimming) were considered as errors. The total number of words generated was then totalled such that a higher score reflected greater verbal fluency.

Self-report measures

The Beck Depression Inventory Version II (BDI-II; Beck, Steer, & Brown, 1996; Van der Does, 2002) was used as a self-report measure of depression symptoms. The BDI-II is a 21-item questionnaire where participants report the frequency of their experience of typical depressive symptoms. A higher score reflects greater experience of depressive symptoms. The BDI showed strong internal consistency (α = .96). The Ruminative Response Scale (Raes, Schoofs, et al., 2009; Treynor, Gonzalez, & Nolen-Hoeksema, 2003) was used to assess one's tendency to cope with depressive mood by ruminating, or thinking repetitively about one’s

symptoms, their causes and effects, and the value that one places in such thinking. A higher score reflects greater tendency to ruminate in this way. The RRS showed strong internal consistency (α = .96).

Procedure

The experimental procedure was approved by the appropriate ethics committee of the authors' university. Participants were told that they would be required to complete a series of tasks to investigate the relationship between different cognitive functions. After providing written informed consent, participants completed the verbal fluency test, the AMT and each of the questionnaires.

Data analysis procedure

We first examined between-group differences in demographic characteristics (e.g., age, gender, education) and correlations between these characteristics and our symptom and cognitive variables (self-reported depression and rumination, and verbal fluency and AMT specificity scores) in order to examine whether it was necessary to include any of these variables as covariates in our main regression analyses.

We then conducted between-group *t*-tests to examine whether depressed participants had significantly worse AMT specificity scores than control participants. We also conducted correlation analyses to examine whether AMT scores showed a continuous association with self-reported depression symptoms (BDI-II scores). In order to examine the unique contribution of these variables to individual differences in specificity, we conducted a linear regression inputting diagnostic status and BDI-II scores as predictor variables. This regression included any demographic variables that showed a significant association with our symptom and cognitive variables.

In a second step in the regression we then included rumination and verbal fluency scores as predictors. Where there was evidence that the inclusion of these additional

predictors altered the association between either diagnostic group or self-reported depression symptoms and specificity scores, we included mean-centred interaction terms in a third step in the regression.

Results

There were no differences between the depressed and control groups in their mean age, their proportions of women or the number of years spent in education. Compared with healthy controls, depressed participants reported significantly elevated depression symptoms and ruminative tendencies and they were also significantly less specific and generated significantly fewer words on the verbal fluency test (see Table 1). Men and women did not differ in their specificity scores, $t(44) = 1.32$, $p = .195$, 95% CI [-0.05, 0.25].

Although depressed participants were significantly less specific than control participants, there was no evidence of a correlation between depression symptoms measured continuously using the BDI-II and specificity (see Table 2 for correlation matrix). There was also no evidence of a significant correlation between specificity and ruminative tendency. However, greater specificity in the AMT was associated with younger age, more years in education and more words generated in the verbal fluency test.

When diagnostic status and BDI-II scores were entered as predictors into a linear regression along with age and number of years in education, only diagnostic status, $B = 0.229$, $SE = 0.088$, $p = .013$, 95% CI [0.05, 0.41], and education, $B = 0.029$, $SE = 0.010$, $p = .009$, 95% CI [0.01, 0.05], explained a significant amount of variance in specificity. BDI-II scores did not explain a significant amount of variance, $B = 0.001$, $SE = 0.003$, $p = .655$, 95% CI [-0.00, 0.01] and neither did age, $B = -0.029$ $SE = 0.010$, $p = .226$, 95% CI [-0.00, 0.01].

In order to explore the contribution of individual differences in rumination and verbal fluency to variance in memory specificity, RRS and verbal fluency scores were entered in a second step. Neither RRS scores, $B = 0.001$, $SE = 0.003$, $p = .697$, 95% CI [-0.01, 0.01], or

verbal fluency scores, $B = 0.003$, $SE = 0.002$, $p = .285$, 95% CI [-0.00, 0.01], explained a significant amount of variance in specificity. Diagnostic status now explained only a trend-level amount of variance, $B = 0.219$, $SE = 0.112$, $p = .059$, 95% CI [-0.01, 0.45], whereas education continued to explain significant amounts of variance, $B = 0.026$, $SE = 0.011$, $p = .023$, 95% CI [0.00, 0.05]. BDI scores continued to explain a non-significant amount of variance, $B = 0.001$, $SE = 0.003$, $p = .875$, 95% CI [-0.01, 0.01] and so did age, $B = -0.002$, $SE = 0.002$, $p = .293$, 95% CI [-0.01, 0.00].

The inclusion of RRS and verbal fluency scores in the regression changed the amount of variance in specificity that was explained by diagnostic status. Also, in our between-group analyses these variables and also BDI-II scores showed significant differences between depressed and control participants. As such, in a third step in the regression terms for the interaction between diagnostic status and mean-centred BDI-II, RRS and verbal fluency scores were entered as predictors (see Table 3). Again, education continued to explain a significant amount of variance in specificity. Also, diagnostic status continued to explain a trend-level amount of variance in specificity. Critically, the interaction between diagnostic status and verbal fluency was a significant predictor. No other variables explained a significant amount of variance in specificity. This model explained 51.5% of the variance in specificity ($p = .001$).

Figure 1 illustrates the interaction between depression status and individual differences in verbal fluency. For participants with depression diagnoses, worse verbal fluency was associated with reduced specificity at the trend level ($r = .41$, $p = .065$) whereas for control participants the relation between these variables was ($r = .28$, $p = .175$).

Discussion

The present investigation is the first to examine whether diagnoses of depression measured categorically or individual differences in depression severity measured continuously explain

unique variance in autobiographical memory specificity. It is also the first to examine the contribution of rumination and executive functioning to these effects.

Our findings are in line with studies suggesting that depressed people show significantly reduced specificity relative to healthy controls (Van Vreeswijk & De Wilde, 2004), but that depression severity measured continuously does not explain differences in memory specificity (Barry, Takano, et al., 2018; Raes et al., 2007; Smets et al., 2013; Takano et al., 2018). While our study replicates findings from other nonclinical samples, it is important to note that our analysis operationalised depression severity using self-reports in a single, narrow, measure of depression, the BDI-II. Given the self-report nature of the BDI-II, it could be that it captures disorder severity differently to clinician-determined diagnoses and that this difference explains why diagnoses explain more variance in specificity than self-reported depression symptoms. It could be the case that whereas diagnoses of depression reflect a significant level of distress and functional impairment, BDI-II scores merely reflect the frequency with which depression symptoms are experienced. It could be that depression symptoms are only associated with reduced memory specificity in cases where they also elicit significant distress and impairment. However, that is not to say that the same findings would be evident for all self-report measures of depression. Other studies have reported an association between the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960) and memory specificity, but not the BDI (Dalgleish, Spinks, Yiend, & Kuyken, 2001). Dalgleish et al. (2001) suggested that the difference between these measures and their relation with specificity could either be due to the mode of administration (self- or clinician- ratings) or the content of each measure. The HRSD is a clinician-administered measure that focuses on the somatic-vegetative aspects of depression rather than the psychological or cognitive aspects of depression as in the BDI. Future studies could explore the possibility that individual differences in depression severity rated by a clinician are associated with rAMS even if self-

reported disorder severity is not, or whether different aspects of depression are differentially associated with rAMS. It could also be that, as rAMS is evident amongst people with a range of diagnoses rather than just MDD, that rAMS is instead associated with the severity of the general distress that underlies all emotional disorders (Naragon-Gainey, Prenoveau, Brown, & Zinbarg, 2016; Prenoveau et al., 2010) rather than the severity of the narrow depressive symptoms that are captured by the BDI-II. Future research could explore this possibility by examining the extent to which the general distress factor that underlies each of the disorders correlates more strongly with specificity than narrow disorder-specific factors.

That self-reported rumination was not associated with differences in specificity is also in line with a recent meta-analysis that drew the same conclusion (Chiu et al., 2018). As Chiu et al. (2018) suggested, this finding does not imply that rumination is not associated with specificity per se, but that either the RRS does not sufficiently capture the aspect of rumination that influences specificity, or that such effects are only evident during ruminative states. Future research might try to replicate the effects observed here but by quantifying variability in rumination using other measures.

The finding that the interaction between depression status and verbal fluency abilities was associated with differences in specificity also suggests that verbal fluency may protect depressed people from rAMS. In our study, there was some evidence that depressed people with strong verbal fluency showed higher memory specificity than those with weaker verbal fluency, whereas for non-depressed people there was no evidence of such a correlation. The relation between specificity and verbal fluency amongst participants with depression was only at the trend level. Further research is therefore needed using an experimental design, rather than the correlational design used here, in order to further examine the relation between executive functioning and specificity. In particular, research might test whether improving executive functioning using novel training protocols (e.g., Schweizer, Grahn, Hampshire,

Mobbs, & Dalgleish, 2013; Schweizer, Hampshire, & Dalgleish, 2011) can in turn lead to an improvement in specificity. Nevertheless, the finding that weak verbal fluency was associated with reduced specificity in people with depression aligns with neuroscience evidence that impaired activation in areas of the brain associated with inhibiting distraction and holding information in working memory contribute towards problems recalling specific memories amongst people with depression (Barry, Chiu, Raes, Ricarte, & Lau, 2018). That a mechanism such as executive functioning impairments could contribute towards specificity problems in one group, such as amongst people with depression, but not another group, such as those without depression, is also in line with neuroscience studies in this area (Barry, Chiu, et al., 2018).

One unanticipated finding within our regression analysis was that a greater number of years in education was associated with greater specificity. Other studies have reported a similar association (Boelen, Huntjens, Van Deursen, & Van Den Hout, 2010; Wessel et al., 2001) but they concluded that this may have been due to the written format of the AMT. Another study which used an oral AMT similar to the one used here, found an association between IQ and AMS (Williams, Williams, & Ghadiali, 1998). It seems unlikely, therefore, that AMT format is responsible for the education-AMS correlation. Nevertheless, future research should account for variability in education in their analyses of AMS.

Besides rumination and executive functioning, the tendency to avoid negative emotions, so called *functional avoidance*, has also been suggested as a key causal factor involved in rAMS (Sumner, 2012) and our analysis did not account for this variable. Dalgleish et al. (2008) suggest that this mechanism may be specific to people who have been exposed to trauma and may not contribute towards rAMS in non-trauma exposed people. As the current investigation did not account for trauma exposure in our samples of depressed and non-depressed people, we did not consider the additional contribution of functional avoidance

to specificity. Van Vreeswijk et al. (2004) suggest in their meta-analysis that one reason why people with depression diagnoses may have reduced specificity compared to people without diagnoses may be because of the experience of significant negative life events, and subsequent avoidance of negative affect, amongst people with depression. This might explain our finding that diagnoses, but not individual differences in depression symptoms, are associated with specificity. It may be that participants with depression diagnoses had experienced significantly more negative life events than participants without diagnoses but that the experience of negative life events was not related to self-reported depression symptoms. Future research might additionally select depressed and non-depressed participants with and without trauma exposure in order to examine whether trauma exposure moderates any of the effects observed here (Ono, Devilly, & Shum, 2015).

It is of note that only one depressed participant in our study was not taking medication. It is possible that the effects observed here are a function of medication use rather than depression per se. Existing research in this area suggests that SSRIs and SNRIs can have beneficial or deleterious effects on cognitive functioning depending on the particular medication one is taking and that the evidence for the cognitive effects of atypical anti-depressants is mixed (Biringer, Rongve, & Lund, 2009). Given that participants in this study were taking a variety of SSRI, SNRIs and atypical medications, it seems unlikely that they would combine to have a deleterious effect on verbal fluency and specificity. In addition, 68.1% of the depressed group were in-patients and half of participants had comorbid diagnoses. As such, one might question the extent to which our sample corresponds with other groups of depressed participants. The mean BDI-II score of our participants with depression was similar to that from other studies in this area involving depressed participants (Eigenhuis, Seldenrijk, van Schaik, Raes, & van Oppen, 2017; Neshat Doost et al., 2014; Raes, Williams, et al., 2009; Werner-Seidler et al., 2018) so it is unlikely that our sample is exceptionally

severe. Nevertheless, future research could examine the contribution of these variables to the observed effects by comparing samples of depressed participants that are medication naïve or not, who do or do not possess comorbidities or between in- and out- patients. One reason we were unable to examine the relations between these variables and specificity was due to the limited size of our sample. Although our study was similarly sized to other investigations in this area (Van Vreeswijk & De Wilde, 2004) future studies might seek to replicate our findings in larger and more varied samples. Finally, only data on (the absence of) current diagnoses in control participants was available. It is also possible that some of our control participants had a history of depression as psychiatric history was not measured in our control sample. This seems unlikely to be the case for all of our control participants given that they were sampled randomly from the community. In addition, if this were the case one would expect our control group to show similar levels of specificity to our group of participants with depression (Young, Bellgowan, Bodurka, & Drevets, 2013). Nevertheless, future studies should explore whether a history of depression moderates any of the effects observed here, particularly regarding any association between verbal fluency and specificity.

Conclusion

Our findings suggest that while individual differences in autobiographical memory specificity are not associated with depression severity, depressed people do show difficulty retrieving specific memories relative to healthy controls. Also, this effect might be explained by executive functioning difficulties amongst depressed people. Further research is needed to explore the causal contribution of impaired executive functioning to specificity problems amongst people with depression.

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Table 1. Participant characteristics

	Depressed	Control		
Demographics				*P*
N	21	25		
Prop. Female	71.4%	76.0%	$x^2(1) = 0.00$	.988
Mean Age	42.71 (13.48)	40.08 (16.29)	$t(44) = 0.59$	.558
Education (yrs)	13.53 (3.08)	13.40 (2.75)	$t(44) = 0.14$	.886
Psychopathology				
BDI-II	30.10 (12.36)	7.16 (5.68)	$t(44) = 8.31$	**< .001**
RRS	58.71 (11.22)	32.68 (8.02)	$t(44) = 9.15$	**< .001**
Specificity	.71 (.28)	.92 (.11)	$t(44) = -3.30$	**.002**
Fluency	28.81 (9.57)	36.84 (9.97)	$t(44) = -2.77$	**.008**

Note. Means (and standard deviations) for each of the demographic and psychopathology variables. *T*-score and x^2 values for between-group comparisons, with *p* values (Bold scores represents $p < .05$). Prop. Female refers to the proportion of females per. group. Specificity refers to proportion of specific memories recalled in the Autobiographical Memory Test. Fluency refers to the number of words generated in the verbal fluency test. BDI-II: Beck Depression Inventory-II; RRS: Ruminative Response Scale.

Table 2. Correlation matrix

	Age	Education	BDI-II	RRS	Specificity
Education	-.41**				
BDI-II	-.05	.13			
RRS	-.09	.12	.79***		
Specificity	-.37*	.43**	-.25	-.24	
Fluency	-.25	.29	-.21	-.17	.44**

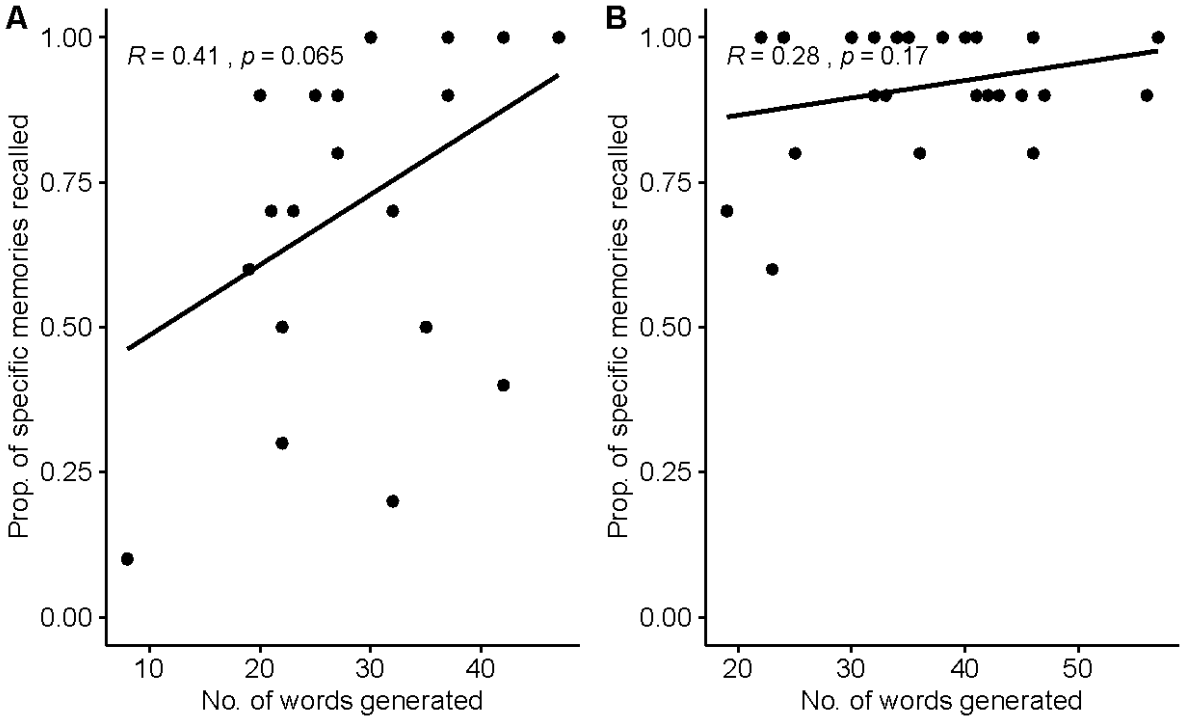
Note. Pearson's correlation coefficients for each of the variables. BDI-II: Beck Depression Inventory-II; RRS: Ruminative Response Scale. Specificity refers to proportion of specific memories recalled in the Autobiographical Memory Test. Fluency refers to the number of words generated in the verbal fluency test. Education refers to the number of years spent in education. *: $p < .05$; **: $p < .01$; ***: $p < .001$.

Table 3. Linear regression

Dependent variable: *Specificity*				*95% CI*	
	B	*SE*	*P*	*Lower*	*Upper*
Dx status	0.235	0.125	**.068**	-0.02	0.49
Age	-0.000	0.002	.666	-0.01	0.00
Education	0.032	0.011	**.004**	0.01	0.05
BDI-II	0.002	0.007	.723	-0.01	0.02
- Interaction with dx status	0.002	0.009	.812	-0.02	0.02
RRS	0.004	0.005	.446	-0.01	0.01
- Interaction with dx status	0.005	0.007	.461	-0.00	0.02
Verbal fluency	-0.003	0.004	.515	-0.01	0.01
- Interaction with dx status	-0.013	0.006	**.041**	-0.03	0.00
R^2 = .515, $F(9, 36)$ = 4.083, p = .001					

Note. Linear regression predicting variability in Autobiographical Memory Specificity, measured using the Autobiographical Memory Test, with diagnostic status (Dx status; Depressed vs. Control), age, number of years in education, individual differences in depression symptoms (BDI-II; Beck Depression Inventory second version), ruminative tendency (RRS; Ruminative Response Scale) and number of words generated in the verbal fluency test. Terms of interactions between diagnostic status and mean-centred indices for RRS scores and verbal fluency were also included. Significant ($p < .05$) and trend ($p < .10$) effects are highlighted in bold.

Figure 1. Interaction between diagnostic status and verbal fluency



Note. Scatter plots (with lines of best fit and confidence intervals) of relation between the number of words generated in the verbal fluency test and the proportion of specific memories recalled in the Autobiographical Memory Test (AMT) for participants with depression (A) and control participants (B).