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Autobiographical memory coherence and specificity: Examining their reciprocal relation and their associations with internalizing symptoms and rumination

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ABSTRACT

Autobiographical memories consist of different features that have been shown to relate to psychological well-being and psychopathology. Two such characteristics show quite some overlap, namely memory coherence and memory specificity, although their association has never been investigated before. In this study, we examined the association between memory coherence and memory specificity in a sample of first-year psychology students. Additionally, to gain more insight into the relation between memory coherence and psychopathology, we investigated the association with known correlates of memory specificity, namely internalizing symptoms and rumination. We found that narrating about personal experiences in a coherent manner is related to retrieving more specific memories. However, the association between memory coherence and memory specificity was rather weak. Furthermore, we found that memory coherence was negatively associated with the level of depressive symptoms and could predict these symptoms even after controlling for memory specificity and rumination. Given the potential clinical importance of these findings, future research should focus on examining the specific circumstances in which memory coherence is related to psychopathology, and on mechanisms that could explain this association.

1. Introduction

Autobiographical memories are memories about personal experiences that go beyond the mere factual description of the event to include personal beliefs, emotions, and thoughts (Bruner, 1990; Conway & Pleydell-Pearce, 2000; Fivush, 2010). Such memories consist of different features, like their emotional intensity, vividness, the amount of detail they entail etc. These features relate differently to psychological well-being and psychopathology (e.g., Kyung, Yanes-Lukin, & Roberts, 2016). In the current study, we will take a closer look at two of these features – memory specificity and memory coherence – and how they relate to each other and to psychopathology.

Memory specificity refers to the extent to which retrieved autobiographical memories are specific or not (i.e., memory of a particular event that happened at a particular time and place that lasted no more than one day). Difficulty with retrieving such specific memories is called overgeneral autobiographical memory or OGM (Williams & Broadbent, 1986). Research has shown that patients who suffer from depression or PTSD exhibit more difficulty recalling specific memories compared to healthy controls and that this difficulty can predict the course of these disorders (e.g., Kleim & Ehlers, 2008; Raes et al., 2006). However, OGM is not a feature of psychopathology in general. It is mainly a characteristic of individuals suffering from major depressive disorder or PTSD, but not, for instance, of patients suffering from an anxiety disorder (e.g., Wenzel, Jackson, Brendle, & Pinna, 2003; Wessel, Meeren, Peeters, Arntz, & Merckelbach, 2001).

Several mechanisms can explain the development of OGM and its association with psychopathology, one of them being rumination (Williams et al., 2007). Rumination refers to the repeated and continuous dwelling over depressive symptoms and their causes and consequences (Nolen-Hoeksema, 1991). When asked to retrieve a specific memory, an individual with a rather negative self-concept could activate a general memory about him- or herself that triggers ruminative thinking about the memory and the personal value of it. While

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ruminating about this general memory, the individual will remain captured at an abstract level, therefore not continuing the search for a specific memory, resulting over time in an overgeneral autobiographical memory (Williams et al., 2007). A number of studies have indeed shown that a ruminative response style shows a negative association with memory specificity and that it in fact mediates the relationship between overgeneral memory and depression (e.g., Raes et al., 2006).

Besides memory specificity, another characteristic of autobiographical memory is memory coherence, i.e. the extent to which autobiographical memories are narrated upon in a coherent manner. Narratives can be considered coherent if the sequence in which the events unfolded is clear and information is provided regarding the time and place they occurred. Additionally, coherent narratives consist of a central theme that is elaborated upon, contain affective and evaluative information, and end in a resolution (Reese et al., 2011). These criteria reflect three separate dimensions within the memory coherence construct; chronology, context, and theme (Reese et al., 2011).

Akin to memory specificity, memory coherence has been related to psychopathology. Research has shown that difficulty with narrating about personally relevant experiences in a coherent manner is associated with depressive symptoms and behavioral problems (Müller, Perren, & Wustmann Seiler, 2014; Stadelmann, Otto, Andreas, von Klitzing, & Klein, 2015), and has been observed in patients suffering from PTSD (see Brewin, 2014). Memory coherence also seems to moderate the association between early life stressors (such as family risk factors and maternal stress) and internalizing symptoms, suggesting it might function as a protective factor against the impact of early life stress (Müller et al., 2014; Stadelmann et al., 2015).

Whereas the relation between memory specificity and psychopathology has been well documented, less is known about the relation between memory coherence and psychopathology. For example, little is known about the nature and direction of their relationship. Additionally, underlying mechanisms that can explain why people who are less coherent show more symptoms of psychopathology have yet to be determined. Besides several unanswered questions, studies that have been focusing on the association between memory coherence and psychopathology have yielded inconsistent findings. Stadelmann (2006), for example, did not find an association between low memory coherence and internalizing symptoms. She accounts this failure to replicate to the heterogeneity within the cluster of internalizing symptoms, arguing that it is possible that memory coherence is only negatively associated with a certain subtype of internalizing symptoms. Additionally, the relationship between memory coherence and PTSD has also been topic of intense debate, with some studies reporting low memory coherence in patients suffering from PTSD, while numerous other studies fail to replicate this finding (see Brewin, 2014 or Rubin et al., 2016 for an overview).

When we compare the literature on memory specificity and memory coherence, it seems that some parallels can be drawn between these two features. For example, both seem to start developing around the same time in childhood and adolescence (see Reese et al., 2011; Yim, Dennis, & Sloutsky, 2013) and both are involved in the self-serving functions of autobiographical memory in similar ways (see Vanderveren, Bijttebier, & Hermans, 2017 for an overview). Additionally, they show similar associations with psychopathology, more specifically with depression and PTSD (e.g., Brewin, 2014; Müller et al., 2014; Williams et al., 2007). There also seems to be some overlap in the way memory specificity and contextual coherence are operationalized. To code a memory as specific it has to consist of one particular event that happened at a particular time and place (Williams & Broadbent, 1986) and this notion of time and place forms the basis of contextual coherence (Reese et al., 2011). In addition to these similarities, some theoretical parallels can be drawn. In order to retrieve a specific memory, information stored in the most concrete and specific layer of the Self-Memory System should be accessed; namely event-specific knowledge (Conway & Pleydell-Pearce, 2000; Williams et al., 2007). Similarly, creating a coherent narrative about a personal experience requires that the individual can access specific information about the event (i.e., time, place, order of the events, emotions and thoughts at the time etc.). So, it seems both memory specificity and memory coherence can be situated at the same hierarchical level within the Self-Memory System (Vanderveren et al., 2017).

We previously proposed that, given the parallels between memory coherence and memory specificity, at least a moderate positive association could be expected between them (see Vanderveren et al., 2017 for a more comprehensive overview of our rationale). If a person has only limited access to specific personal memories, it seems indeed reasonable to assume that this would strongly hinder creating coherent narratives about these experiences. Conversely, if an individual cannot make sense or meaning out of an experience and therefore cannot construct a coherent narrative, this could disturb the emotional processing of the event, which could make retrieval of specific memories too threatening (Todd, Gandolphe, Nandrino, Hancart, & Vosgien, 2013). However, there are certainly examples imaginable of memories being specific, yet lacking coherence. Intrusive memories, for instance, are highly vivid, detailed, and specific memories, yet often highly disorganized and fragmented (see Brewin, 2014 for an overview). This example shows that, even though a positive association can be expected, the relation between memory coherence and memory specificity will very likely be more complex than a simple one-to-one association.

The current study has two main objectives. First, the association between memory coherence and memory specificity will be examined. Based on the similarities between these two features, we predict that a positive association will be found. Given the similarities on a conceptual level, we expect the strongest associations between contextual coherence and memory specificity. Second, to broaden our understanding of the relation between memory coherence and psychopathology, the association between memory coherence and known correlates of memory specificity (i.e., internalizing symptoms and rumination) will also be examined. Assuming some overlap between memory coherence and memory specificity, we predict a negative association between memory coherence and depressive symptoms, but not between memory coherence and anxiety-related symptoms. Finally, akin to memory specificity, we predict that a ruminative response style mediates the association between memory coherence and depressive symptoms.

2. Method

2.1. Participants

A sample of 229 first-year psychology students participated in this study, of which 197 women (86%) and 32 men (14%). The mean age of the sample was 18.4 (SD = 1.24; *range* = 17–29).

2.2. Procedure

First-year psychology students were able to sign up for this study to gain course credit. Participants were collectively informed about the content and design of the study, after which they were asked to sign an informed consent. After they completed the study, the participants received a short debrief. This study was approved by the Social and Societal Ethics Committee of the KU Leuven and was pre-registered on AsPredicted (https://aspredicted.org/6wq2p.pdf).

Table 1
Descriptive information.

	Descriptives			Gender differences				
				Boys n = 32		Girls n = 197		
	Min-Max	M	SD	M	SD	M	SD	t (df)
NACO_CON	0–3	1.47	0.77	1.55	0.86	1.46	0.76	0.60 (225)
NACO_CHR	0–3	2.10	0.73	2.20	0.78	2.09	0.72	0.83 (225)
NACO_THE	0–3	1.94	0.70	1.89	0.79	1.95	0.68	−0.46 (225)
NACO_POS	0–3	1.76	0.67	1.79	0.76	1.75	0.65	0.30 (226)
NACO_NEG	0–3	1.92	0.70	1.97	0.80	1.92	0.69	0.40 (226)
NACO_TOT	0–3	1.84	0.57	1.88	0.67	1.83	0.55	0.38 (38.06)[a]
AMT_TOT	0.06–1	0.78	0.25	0.76	0.23	0.79	0.25	−0.70 (227)
DASS_DEPR	0–2.86	0.71	0.59	0.76	0.57	0.71	0.60	0.51 (227)
DASS_ANX	0–2.14	0.62	0.49	0.63	0.47	0.61	0.49	0.24 (227)
DASS_TOT	0–2.57	0.78	0.47	0.76	0.39	0.78	0.49	−0.18 (227)
LARSS_CAUS	1–5	3.02	0.87	3.39	0.85	2.97	0.86	2.58*(224)
LARSS_UND	1–5	2.43	0.88	2.88	0.88	2.36	0.86	3.12**(218)
LARSS_UNCON	1–5	2.95	0.98	3.18	0.90	2.91	0.99	1.41 (223)
LARSS_TOT	1–5	2.80	0.80	3.17	0.77	2.74	0.79	2.76**(211)

Note. NACO_CON = contextual coherence; NACO_CHR = chronological coherence; NACO_THE = thematic coherence; NACO_POS = coherence of positive narratives; NACO_NEG = coherence of negative narratives; NACO_TOT = total coherence; AMT_TOT = memory specificity; DASS_DEPR = depressive symptoms; DASS_ANX = anxiety-related symptoms, DASS_TOT = total internalizing symptoms; LARSS_CAUS = causal analysis; LARSS_UND = understanding; LARSS_UNCON = uncontrollability; LARSS_TOT = total rumination.
*$p < .05$, **$p < .01$.
[a] Independent *t*-test adjusted for unequal variances across gender.

2.3. Instruments

2.3.1. Memory specificity

Memory specificity was assessed using a computerized version of the *Autobiographical Memory Test* (AMT; Williams & Broadbent, 1986). Participants were asked to retrieve a specific memory in response to 18 different emotional cue words. Each answer was later coded as a specific or a general memory using a computerized coding system (Takano et al., 2016). This machine learning based algorithm uses linguistic features to discriminate between specific versus non-specific memories. Besides distinguishing between specific versus non-specific memories, this computerized coding method can discriminate between the five classes of AMT responses (specific, categorical, extended, semantic association, omission), though significantly less reliable. Since this distinction was not crucial for our research questions, we opted to use the binary coding method. This computerized coding method has been proven to be equally reliable in discriminating between specific versus non-specific memories compared to manual scoring (Takano et al., 2016; Takano, Gutenbrunner, Martens, Salmon, & Raes, 2018).

2.3.2. Memory coherence

To assess the participants' memory coherence, they were asked to write down a very positive and a very negative life event. These narratives were later coded for chronology, context, and theme according to the *Narrative Coherence Coding Scheme* (Reese et al., 2011). The scores for each of the three dimensions are added to an overall coherence score for the positive and negative narrative, with the latter two being add up for a total memory coherence score. The specific coding criteria and some example narratives can be found in Appendix A and B, respectively. The reliability of this coding scheme has already been repeatedly demonstrated across all ages and dimensions (e.g.; Reese et al., 2011; Waters & Fivush, 2015). Interrater reliability across the three different dimensions was good, with Cohen's kappa being .86, .80, and 0.80 for respectively contextual, chronological, and thematic coherence.

2.3.3. Internalizing symptoms

The Dutch translation of the *Depression Anxiety Stress Scales-21* (DASS-21; de Beurs, Van Dyck, Marquenie, Lange, & Blonk, 2001) was used to screen for depressive and anxiety symptoms. The DASS-21 is a self-report questionnaire that consists of three subscales; depression, anxiety, and stress. Numerous studies have proven the validity and reliability of the DASS-21 (e.g., Osman et al., 2012; Page, Hooke, & Morrison, 2007).

2.3.4. Rumination

Rumination was assessed by administering the *Leuven Adaptation of the Rumination on Sadness Scale* (LARSS; Raes, Hermans, Williams, Bijttebier, & Eelen, 2008). The LARSS is a self-report questionnaire that comprises three subscales, namely causal analysis, understanding, and uncontrollability. The validity and reliability of the LARSS have been demonstrated in a study of Raes, Hermans, Williams, Bijttebier, and Eelen (2008).

2.4. Data-analysis

SPSS 24.0 was used to analyze the assembled data. Pearson correlation coefficients were calculated to examine the associations between memory coherence, memory specificity, internalizing symptoms, and rumination. By conducting *Steiger's Z*-tests, the strength of these correlation coefficients was compared between the different subcomponents of memory coherence. Multiple linear regression analyses were conducted to examine the extent to which memory coherence adds to the prediction of depressive symptoms after controlling for both memory specificity and rumination.

3. Results

3.1. Descriptive statistics

Mean, standard deviation, and Cronbach's alpha of all variables are presented in Table 1. A significant gender difference was observed for rumination, with males reporting more rumination than females. Interestingly, Paired-samples t-tests revealed that narratives about negative events were more coherent than narratives about positive events, $t_{(226)} = -3.26$, $p < .01$. With regards to the separate dimensions of memory coherence, narratives about negative events were more chronologically, $t_{(226)} = -3.53$, $p < .01$, and thematically coherent, $t_{(226)} = -2.23$, $p = .03$.

Table 2
Pearson correlation-coefficients between memory coherence, memory specificity, internalizing symptoms, and rumination.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. NACO_CON	–													
2. NACO_CHR	.44***	–												
3. NACO_THE	.30***	.46***	–											
4. NACO_POS	.60***	.68***	.62***	–										
5. NACO_NEG	.67***	.67***	.61***	.37***	–									
6. NACO_TOT	.76***	.82***	.74***	.82***	.84***	–								
7. AMT_TOT	.15*	.23**	.19**	.17*	.21**	.24***	–							
8. DASS_DEPR	-.08	-.12	-.13	-.07	-.17*	-.14*	-.08	–						
9. DASS_ANX	-.11	-.13	-.06	-.11	-.11	-.13	-.12	.59***	–					
10. DASS_TOT	-.08	-.12	-.09	-.08	-.13*	-.13	-.11	.86***	.84***	–				
11. LARSS_CAUS	-.01	-.04	.03	.01	-.04	-.01	.13	.32***	.29***	.39***	–			
12. LARSS_UND	-.07	-.12	-.01	-.08	-.07	-.09	-.06	.31***	.31***	.35***	.73***	–		
13. LARSS_UNCON	-.00	-.05	.00	.01	-.05	-.02	.01	.48***	.39***	.53***	.68***	.56***	–	
14. LARSS_TOT	-.01	-.08	.02	.00	-.05	-.03	.02	.42***	.37***	.48***	.91***	.87***	.86***	–

Note. NACO_CON = contextual coherence; NACO_CHR = chronological coherence; NACO_THE = thematic coherence; NACO_POS = coherence of positive narratives; NACO_NEG = coherence of negative narratives; NACO_TOT = total memory coherence; AMT_TOT = memory specificity; DASS_DEPR = depressive symptoms; DASS_ANX = anxiety-related symptoms, DASS_TOT = total internalizing symptoms; LARSS_CAUS = causal analysis; LARSS_UND = understanding; LARSS_UNCON = uncontrollability; LARSS_TOT = total rumination.
$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

3.2. Association between memory coherence and memory specificity

Memory coherence was positively associated with memory specificity, with more coherence being related to retrieving more specific memories (see Table 2 for an overview of all correlations). All three dimensions of memory coherence showed a positive association with memory specificity. However, *Steiger's Z*-test revealed no significant differences between the three dimensions of coherence and their association with memory specificity, *Steiger's* $Z_{con,chr} = -0.88$, $p = .19$; *Steiger's* $Z_{con,the} = -0.42$, $p = .33$; *Steiger's* $Z_{chr,the} = 0.45$, $p = .33$.

3.3. Association between memory coherence and internalizing symptoms

Pearson correlation coefficients showed a significant negative association between memory coherence and depressive symptoms, but not between memory coherence and anxiety-related symptoms (Table 2), though these correlations did not differ significantly, *Steiger's* $Z = -0.18$, $p = .43$. The same applies for the coherence of negative narratives. The coherence of positive narratives and the three dimensions of memory coherence were not significantly related to both depressive and anxiety-related symptoms. Similarly, associations between memory specificity and internalizing symptoms were not significant.

Hierarchical regression analysis revealed that memory coherence could not predict depressive symptoms after controlling for both rumination and memory specificity (Table 3). However, since the coherence of negative narratives showed the strongest negative association with depressive symptoms (although not significantly stronger than the coherence of positive narratives), we conducted the same analysis with the coherence of negative narratives as a predictor (Table 3). This analysis showed that the coherence of negative narratives was able to predict depressive symptoms after controlling for rumination and memory specificity.

Table 3
Hierarchical multiple linear regression analyses predicting depressive symptoms as a function of memory coherence, memory specificity, and rumination.

Model	Predictors	*β*	*SE*	*t*	*p*	$r^2_{x(y.z)}$
1	(constant)	.24	.21	1.15	.25	
	NACO_TOT	-.11	.07	−1.67	.10	.01
	AMT_TOT	-.24	.16	−1.48	.14	.01
	LARSS_TOT	.31	.05	6.68	.00	.17
2	(constant)	0.22	0.20	1.10	.27	
	NACO_NEG	−0.11	0.05	−2.10	.04	0.02
	AMT_TOT	−0.19	0.16	−1.24	.22	0.01
	LARSS_TOT	0.31	0.05	6.63	.00	0.17

Note. NACO_TOT = total coherence; NACO_NEG = coherence of negative narratives; AMT_TOT = memory specificity; LARSS_TOT = total rumination.

3.4. Association between memory coherence and rumination

Pearson correlation coefficients between memory coherence and different dimensions of self-reported rumination revealed near zero correlations (Table 2). Similarly, memory specificity was not significantly associated with rumination in this sample.

4. Discussion

The objectives of the current study were twofold. First, we investigated how two features of autobiographical memories, memory coherence and memory specificity, relate to each other. Second, to broaden our understanding of how memory coherence relates to psychopathology, we investigated its association with known correlates of memory specificity, namely internalizing symptoms and rumination. We predicted a positive association between memory coherence and memory specificity, especially between contextual coherence and memory specificity. Additionally, we expected a negative correlation between memory coherence and depressive symptoms, but not between memory coherence and anxiety-related symptoms. Finally, we predicted that rumination would mediate the association between depressive symptoms and memory coherence.

Consistent with predictions, we found that memory coherence and memory specificity were positively correlated with each other. These results suggest that individuals who are adept to narrate about personal experiences in a coherent manner retrieve more specific memories and vice versa. Contrary to our expectations, contextual coherence did not show the strongest association with memory specificity. Overall, the associations between memory coherence and memory specificity were rather weak, suggesting that, despite the similarities between the two, memory coherence and memory specificity do represent empirically different aspects of autobiographical memories. However, given that university students generally score fairly high on the standard AMT (Raes, Hermans, Williams, & Eelen, 2007), limited range in scores might lead to an underestimation of the true correlation between memory specificity and coherence. Therefore, more research is needed to fully grasp the nature of the relationship between the two. Experimental studies manipulating one or the other could offer more information about the nature of their relationship and could allow for more precise investigations of how the different dimensions of memory

coherence relate to memory specificity.

Regarding the association between memory coherence and internalizing symptoms, results are in correspondence with our predictions, with more memory coherence being related to less internalizing symptoms. More specifically, overall memory coherence was negatively related to depressive symptoms. Additionally, coherence of negative narratives was negatively related to both depressive symptoms and overall internalizing symptoms. Our results are in line with previous studies reporting a negative association between memory coherence and internalizing symptoms (e.g., Müller et al., 2014). However, as we discussed earlier, other studies reported no significant associations between the two (e.g., Stadelmann, 2006). Stadelmann et al. (2015) hypothesized that these inconsistencies could be explained by the fact that these studies did not differentiate between different types of internalizing symptoms. Akin to memory specificity, it could for example be possible that memory coherence is only related to depressive symptoms and not to anxiety-related symptoms. In line with this hypothesis, we found a significant negative association between memory coherence and depressive symptoms, but not between memory coherence and anxiety-related symptoms. Both correlations did, however, not differ significantly in magnitude.

Our study showed, contrary to previous studies, no significant association between memory specificity and depressive symptoms. This is, however, not that surprising given that a number of previous studies examining memory specificity in a community sample also failed to observe this association (see Raes et al., 2007). Reviews and meta-analyses have shown that overgeneral memory is mainly a characteristic of clinically depressed individuals (van Vreeswijk & de Wilde, 2004; Williams et al., 2007). Therefore, it is important to replicate this study in a clinical sample.

To understand why people who narrate about personal experiences in a more coherent manner report less depressive symptoms, we hypothesized that a ruminative response style would mediate this relationship. However, contrary to our predictions, we found near-zero correlations between rumination and memory coherence. The same was observed regarding memory specificity, which corresponds with a recent meta-analysis showing an almost non-existing effect between memory specificity and trait rumination (Chiu et al., 2018). However, the association between memory specificity and rumination is usually stronger in clinical samples compared to student or community samples such as the current one (Raes et al., 2007). In addition, experimental studies showed that inducing a ruminative response style causes more overgeneral memories (Raes, Watkins, Williams, & Hermans, 2008; Watkins, Teasdale, & Williams, 2000). Therefore, it would be important to further examine the association between memory coherence and rumination both experimentally and in a clinical sample.

Interestingly, we found that narratives about negative experiences were overall more coherent than narratives about positive experiences. On a sublevel, these narratives were more chronologically and thematically coherent. These findings are in line with previous studies (Baker-Ward, Eaton, & Banks, 2005; Fivush, McDermott Sales, & Bohanek, 2008). Fivush et al. (2008) suggest that encountering negative experiences urges people to try to make sense of them and these efforts to create meaning are reflected in more coherent narratives. Boals, Banks, Hathaway, and Schuettler (2011) argue that this process of meaning making can be seen as a precursor of the ability to create coherent narratives. Therefore, valuable insights could be obtained by examining meaning making as a potential mechanism that could explain why low memory coherence is related to more depressive symptoms.

Some limitations to the present study should be noted. First of all, the study was conducted in a sample of first-year psychology students, which is a very specific and homogeneous group, thus limiting the generalizability of these results. For example, we found a significant gender effect with regards to rumination, with male students reporting more rumination than females. This is quite unusual given that a multitude of other studies generally observe the opposite (see Johnson & Whisman, 2013). We attribute this surprising finding to the specific characteristics of the sample. It would not be farfetched to assume that adolescent boys starting an education in psychology might differ from other boys in some regard and that this might explain the unusual finding. Results should therefore be interpreted with the necessary caution and should be replicated in a general population sample as well as in a clinical sample. Second, this study exclusively consisted of self-report measures. To exclude the possibility that shared method variance caused an overestimation of the correlations, future studies should use a multi-method and multi-informant assessment. Finally, a correlational design was used, which inhibits us from making any statements about causality or the direction of the observed associations. To overcome this limitation, experimental study designs, such as the ones we hinted at earlier, are required.

Although the findings of the current study should be interpreted with the necessary caution, results suggest that valuable insights could come from investigating how memory coherence relates to memory specificity and to psychopathology. Not only could it broaden our understanding of how different features of autobiographical memory relate to each other and to psychopathology, it could potentially hold important clinical implications. For example, MEmory Specificity Training (MEST) has been successful in decreasing depressive symptoms (Raes, Williams, & Hermans, 2009). More knowledge about the dynamics between memory specificity and memory coherence could influence the content of this memory training. Instead of only focusing on specificity, the training could target overall memory coherence as well (Vanderveren et al., 2017). Naturally, additional experimental and clinical studies are required.

5. Conclusion

This study was the first to specifically examine the relationship between memory coherence and memory specificity and known correlates of memory specificity; namely internalizing symptoms and rumination. We found that the ability to retrieve specific memories is positively related to the ability to narrate about these personal memories in a coherent manner. Additionally, we found that more memory coherence was related to less depressive symptoms. The coherence of negative narratives was able to predict depressive symptoms, also after controlling for both memory specificity and rumination. However, we did not find any associations with rumination, which raises the question as to what underlying mechanisms can explain the negative association between memory coherence and depressive symptoms. Additional research is needed to further examine the nature of the relationship between memory coherence, memory specificity and depressive symptoms, and to examine possible underlying mechanisms.

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Appendix A. Supplementary data

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