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ADVANCED REVIEW

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Autobiographical memory and psychopathology: Is memory specificity as important as we make it seem?

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Abstract

Several decades of research have established reduced autobiographical memory specificity, or overgeneral memory, as an important cognitive factor associated with the risk for and maintenance of a range of psychiatric diagnoses. In measuring this construct, experimenters code autobiographical memories for the presence or absence of a single temporal detail that indicates that the remembered event took place on a single, *specific*, day (*Last Thursday* when I rode bikes with my son), or multiple days (*When I rode bikes with my son*). Studies indicate that the specificity of memories and the amount of other episodic detail that they include (e.g., who, what, and where) are related and may rely on the same neural processes to elicit their retrieval. However, *specificity* and *detailedness* are nonetheless separable constructs: imperfectly correlated and differentially associated with current and future depressive symptoms and other associated intrapersonal (e.g., rumination) and interpersonal (e.g., social support) outcomes. The ways in which the details of our memories align with narrative themes (i.e., agency, communion, identity) and the coherence with which these details are presented, are also emerging as important factors associated with psychopathology. The temporal specificity of autobiographical memories may be important, but other memory constructs warrant further attention in research and theory, especially given the associations, and dependencies, between each of these constructs. Researchers in this area must consider carefully whether their research questions necessitate a focus on autobiographical memory specificity or whether a more inclusive analysis of other autobiographical memory features is necessary and more fruitful.

This article is categorized under:

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KEYWORDS

depression, episodic memory, mental illness, psychopathology, semantic memory

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1 | INTRODUCTION

In 1917, Baxter et al. examined the relative difficulty that some people had in recalling past personally experienced unpleasant events compared to pleasant events. Participants were asked to bang on the table when they had retrieved a memory. Whether they did so, and the time it took them to do so, were measured. This method for operationalizing autobiographical memory continued into the 1970s and early 1980s in studies that examined the effect that negative or depressive mood states have on the number of, and speed with which autobiographical memories are retrieved (Lloyd & Lishman, 1975; Snyder & White, 1982; Teasdale et al., 1980; Teasdale & Fogarty, 1979). By the late 1980s and early 1990s, researchers began to consider not just whether memories could be retrieved (and how fast) but also the different kinds of autobiographical memories that people retrieve and the details that differentiate them. Studies began to examine the difficulty that people with psychiatric diagnoses experience when retrieving memories for specific instances in their life that lasted for a day or less (e.g., *Last Thursday when I walked my dog*) and their tendency to instead retrieve non-specific or overgeneral memories for extended (e.g., *When I owned a dog*) or repeated life events (e.g., *When I used to walk my dog*) (Dritschel et al., 1988; Williams & Broadbent, 1986; Williams & Dritschel, 1992). Most of this research adopted a cued recall paradigm and imposed a time limit on participants' responses. Measuring autobiographical memory in terms of the number of specific or non-specific/overgeneral autobiographical memories has remained popular within psychopathological investigations of psychiatric diagnoses and symptoms (Barry et al., 2021). And yet, the temporal detail that separates specific from non-specific memories (in the example above, *Thursday*) is just one of many possible details that an autobiographical memory might include.

Theories that describe the process by which autobiographical memories are retrieved and constructed suggest that our autobiographical memories are a synthesis of episodic (who, what, where, when) and semantic (general knowledge, metacognitive reflections, etc.) details. These theories stress the importance of being able to retrieve event-specific knowledge, or the episodic details that characterize particular events held in our memory, but they do not attribute particular primacy to the temporal detail that separates specific autobiographical memories from other kinds of autobiographical memories (Conway & Pleydell-Pearce, 2000; Schacter & Addis, 2007). Why then has psychopathological research focused on the ability to retrieve this temporal detail within our autobiographical memories and is this focus warranted? Are the abilities to retrieve specific memories and memories that are rich in episodic and semantic detail related or separable constructs? What neurocognitive and social factors contribute to our retrieval and sharing of our memories and how do these factors influence the detail and specificity of these memories? How might this differ as a function of developmental stage or culture? What does this mean for the role of autobiographical memory in psychopathology? What do the answers to these questions mean for interventions that seek to alleviate psychopathology through modifying autobiographical memory?

Studies have begun to delineate between autobiographical memory specificity and detailedness more broadly, examining the relations between these constructs, their associations with other processes and outcomes, such as the symptoms of psychiatric diagnoses, and the developmental and cultural process that influence them (Hallford, Barry, et al., 2021; Kyung et al., 2016; Roberts et al., 2018; Salmon et al., 2021). This review places this work in context and considers it relative to other investigations and theories that explain the process by which our autobiographical memories are constructed, elaborated upon, and shared with others and the effect that individual differences in autobiographical memory can have on our thoughts about ourselves, our future, and others. We do this with the aim of examining whether the primacy of autobiographical memory specificity within the extant psychopathological literature is warranted or whether a broader analysis of memory detail—and integration of previously separate theoretical frameworks—is necessary to move the field of autobiographical memory and psychopathology forward. We first present how individual differences in autobiographical memory retrieval have been measured and what this means for the specificity and detail constructs and the ways in which they have been operationalized.

2 | TEMPORAL SPECIFICITY AND THE DETAILEDNESS OF MEMORIES

2.1 | Measurement, coding, and operationalization

The most common measure within this field, the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986), typically presents participants with neutral (*house*), positive (*confident*) or negative (*ashamed*) words and gives them 60 s to retrieve a specific autobiographical memory related to each. Importantly, although the traditional—or most

commonly used variant of the AMT—gives participants explicit instructions to retrieve specific autobiographical memories, other variants such as the Minimal Instructions variant of the AMT also exist (Debeer et al., 2009). This variant was created to, among other things, assess not just the *ability* to retrieve specific autobiographical memories when instructed to but also the *tendency* to retrieve such memories when merely asked to think about past events. Similarly, an alternating instructions AMT, where participants are given alternating instructions to retrieve specific and non-specific memories, has also been created in order to capture a persons autobiographical memory flexibility or their ability to shift between memory types (Dritschel et al., 2014). Each of these instructional variants of the AMT highlight the importance that instructions can have on what is retrieved and how it is retrieved. This in turn has implications for our operationalization of autobiographical memory.

Nevertheless, the cue word approach used within the AMT may be insufficiently sensitive at detecting reduced autobiographical memory specificity in people (adolescents and also adults) who do not (perhaps yet) have difficulties of clinical levels of severity that compromise their ability to retrieve specific memories, and also because of varying levels of self-relevance and the limited amount of detail that the cue words often elicit (Farina et al., 2019; Salmon et al., 2021). Salmon et al. (2021) overcame this by including the AMT, as well as a novel narrative task that gave participants 7 min to recall a highly self-relevant event, a single episode in their life that represented a turning point for what their life is like or who they are. Other cuing paradigms, such as the Autobiographical Interview (Levine et al., 2002) or other similar paradigms, cue participants by asking them for events that occur within specific time periods of their life (e.g., between the person's 16th birthday and 1 year ago; Ritchie et al., 2006). Habermas and Diel (2013) combined several of these study designs by asking participants to describe their life story while trying to include seven important events within their narrative.

Responses in these kinds of tasks are typically given verbally and then recorded, transcribed, and coded by the experimenter(s). However, some studies, including those that have compared episodic specificity and detailedness such as those described here (Hallford, Barry, et al., 2021; Kyung et al., 2016; Salmon et al., 2021) have asked participants to type or write down their responses. After this, experimenters code whether a memory refers to a specific event that lasted less than 24 h (specific), whether it refers to a repeated event (categoric), whether it refers to an event longer than 24 h (extended), whether it refers to some related semantic information (semantic associate) or whether no response was given (omission) (Williams & Broadbent, 1986). Studies typically then quantify the number (or proportion) of each memory type that is recalled, often focusing on the number (or proportion) of specific memories recalled. Some studies sum together the number of categoric and extended memories and refer to this as *non-specific* or (over)general memories.

Responses within the above-mentioned tasks can also be segmented into episodic or semantic informational bits or details following the procedure of Levine et al. (2002). Episodic details refer to the event itself (e.g., people present, their actions), the place it occurred, and any thoughts, feelings or emotions experienced during the event. Semantic details refer to more general or factual knowledge, perhaps related to ongoing events or other autobiographical events, as well as retrospective reflections on the event itself and other events (not the main event of interest). For example, "*Last Thursday when I walked my dog; dogs need walking every day*," includes two episodic details, a temporal detail (*Last Thursday*) and an event (*walked my dog*), and a single semantic detail regarding the fact about dog walking. Studies then typically quantify the number of each kind of detail either/both across memories and/or within types of memories, such as the number of episodic details within specific autobiographical memories (Hallford, Barry, et al., 2021; Kyung et al., 2016). It is worth noting that some studies also use separate tasks to quantify different components of autobiographical memory, given the differential sensitivity of the available tasks to capturing each of these components. For example, Salmon et al. (2021) used an AMT to capture autobiographical memory specificity and then used their narrative task to measure episodic detail given the apparent limitations of the AMT and the relative strength of a longer duration, highly self-relevant, turning point narrative task.

Although most studies in this area measure specificity and detailedness separately, in some studies, such as the study by Levine et al. (2002) and others involving people with psychiatric diagnoses (e.g., Corcoran & Frith, 2003; Potheegadoo et al., 2012), episodic detailedness and specificity are conflated into a single scale. In this scale, memories are said to be more specific, and are given a higher score, if they are richer in detail if they include temporal details referring to a single time-limited event. However, this method precludes any analysis of the association between detail and (temporal) specificity as separable constructs and is by no means common within the prevailing autobiographical memory specificity and psychopathology literature (Barry et al., 2021). Nevertheless, these paradigms have collectively been used to examine the association between the ability to retrieve specific autobiographical memories and memories that are rich in detail, and their associations with other process (e.g., rumination) or psychiatric (e.g., depression) variables.

2.2 | The association between specificity and detailedness

To our knowledge, Habermas and Diel (2013) provided the first direct examination of the ability to recall specific autobiographical memories and the amount of episodic detail included within these and other memories among community adults and young people. Their measurement of detail counted references to place, person and date that were reported across a person's entire narration of their life story, while also measuring the number of specific events that were reported within these narratives. They found weak and non-significant correlations between the amount of detail that participants reported across their life story and the number of specific autobiographical memories that participants included in these narratives. The fact that details were measured across the narratives and not necessarily within the memories that were included in the narratives meant that it was not possible to discern how much of this detail was included in the specific events or other events that might have been mentioned within the narratives.

Kyung et al. (2016) therefore followed this study up, using the AMT methodology rather than personal narratives, with an examination of healthy undergraduates' abilities to recall specific autobiographical memories and the extent to which these memories, once retrieved, were rich in episodic detail. Put otherwise, they examined the number of specific autobiographical memories that a person can retrieve, and the number of episodic details included within these memories. Their analysis found a non-significant correlation between the specificity of, and detail within, specific memories.

In a follow-up, re-analysis to Kyung et al. (2016), Roberts et al. (2018) showed that, within a cued recall task where people are asked to recall many autobiographical memories, the number of specific autobiographical memories that people retrieve, and the amount of episodic detail included within these memories, both take opposing curvilinear trajectories. People's recall of specific autobiographical memories is best at the start and end of a cued recall task, and yet their retrieval of episodic details is most rich during the middle of the task when they are retrieving fewest specific memories. A subsequent follow-up study from the same lab found that the number of episodic details within specific memories was only weakly correlated with ability to retrieve specific memories (Roberts et al., 2021).

Together, these analyses provided some evidence of a disassociation between the ability to recall specific autobiographical memories and the ability to recall detail-rich memories. Nonetheless, the analyses of Kyung et al. (2016) Roberts et al. (2018) and Roberts et al. (2021) were confined to the amount of episodic detail included within specific autobiographical memories and it was unclear whether similar associations, or a lack thereof, would exist across specific and non-specific memories or whether they would also be present for semantic details.

Hallford, Ricarte, and Hermans (2021) therefore examined whether the findings of Kyung et al. (2016) and Roberts et al. (2018) would replicate, while extending them to an analysis of non-specific memories and semantic details too. Their analysis included four independent samples of community adults from around the world, enabling them to look at differences between cultures in these associations while also taking a meta-analytical approach, across samples, too. In their analysis across samples, they found that, contrary to the findings of Kyung et al. (2016), people who were able to retrieve more specific memories also retrieved more episodic detail in these memories. They also extended the findings of Kyung et al. (2016) by showing that people who were able to retrieve more specific memories retrieved more episodic detail in their non-specific memories too. In addition, people who retrieved more episodic details also retrieved more semantic details. These findings might appear to indicate that some people recall their autobiographical memories with particularly rich detail, irrespective of their specificity. However, they also found that specific memories included more episodic details than non-specific memories, whereas non-specific memories included more semantic details than specific memories. Furthermore, there was only a weak and non-significant association between the number of specific memories a person can retrieve and the number of semantic details in these and other memories. Subsequently, Lam et al. (2022) replicated the finding of a correlation between specific memories and detail in an adolescent sample. Together, these findings conflict with those of Kyung et al. (2016), suggesting that not only do people who tend to retrieve more specific memories also tend to retrieve more detailed memories, specific memories themselves may also be unique for being particularly rich in episodic detail.

In overview, the available evidence from direct comparisons of autobiographical memory specificity and detailedness suggests that these are related yet separable constructs. More specifically, although the two are often positively correlated, it is possible to be specific and low in detail (e.g., *When I was at home last Sunday*), or to be non-specific and high in detail (e.g., *When I'm at home with my wife watching the show "Swanenburg" on the Dutch TV-channel NPO while enjoying a nice glass of red wine with a piece of Côte d'Or pure dark chocolate and petting our cat Spikie in the couch on Sundays*). It is possible that these constructs might be explained by different processes and may have differential effects on how we use memories to understand ourselves and operate in the world. As such, it is worth considering

evidence from research that has examined the processes underlying autobiographical memory and whether these studies say anything about the association between, or independence of, autobiographical memory specificity and detailedness. First, we consider the role that neurocognitive processes associated with memory retrieval have in determining the specificity and detail of our autobiographical memories and what this tells us about detail and specificity and their relations with one another.

3 | ASSOCIATED PROCESSES, MECHANISMS, AND OUTCOMES

3.1 | Neurocognitive perspectives on autobiographical memory

Studies that have explored the neural mechanisms underlying the retrieval and re-experiencing of autobiographical memories have highlighted the importance of a network of regions surrounding the prefrontal cortex, the medial temporal lobe, the limbic system, and the occipital lobe (see Barry, Chiu, et al., 2018, for a review). Several such studies have found that regions within this network are differentially activated during the retrieval, construction and/or elaboration of specific, compared to non-specific, autobiographical memories (Addis et al., 2004, 2012; Hennessy Ford et al., 2011; Holland et al., 2011; Levine et al., 2004; Maguire & Mummery, 1999; Ros et al., 2017). Some of these studies have further distinguished between the level of detail within these comparisons (Addis et al., 2004; Hennessy Ford et al., 2011; Holland et al., 2011; Levine et al., 2004). In the first of these (Levine et al., 2004), detail and specificity where conflated into a single index where more detailed memories that also referred to a specific event were given the highest score relative to less detailed and non-specific memories. This study found that highly detailed and specific memories, compared to less detailed and non-specific memories, uniquely activated ventrolateral prefrontal cortex, perhaps due to the additional demands placed on working memory when thinking about such rich memories. Concurrently, Addis et al. (2004) provided the first delineation between specificity and detail. Their analyses suggested that the enhanced activation in the hippocampus that can be evident during retrieval of specific versus non-specific memories (e.g., Maguire & Mummery, 1999) is more likely to be attributable to the rich detail that specific memories are retrieved with compared to non-specific memories. Indeed, groups of people who have difficulty retrieving episodically rich, specific autobiographical memories also show impoverished activity in this network of brain regions including the VLPFC and hippocampus during memory retrieval and elaboration (e.g., St. Jacques et al., 2012). However, Holland et al. (2011) have also found that any differential activation during retrieval of specific versus non-specific autobiographical memories is independent of the level of detail included within these memories. Nevertheless, Holland et al. (2011) reconcile the apparent conflict between their findings and those of Addis et al. (2004) and others (e.g., Hennessy Ford et al., 2011) by suggesting that it may not be that the (anterior) hippocampus is involved in the retrieval of detail per se but that instead it plays a role in the organization of episodic details. The temporal specificity of specific autobiographical memories is suggested to place a higher burden on such organization and so relies on this region of the brain to greater extent than non-specific memories.

In summary, there are few neuroscience studies that have delineated between specificity and detail and their findings have been mixed. There is some suggestion that specific memories may rely on unique patterns of neural activation compared to otherwise detail-rich memories, though these findings are not consistent. It is possible that Levine et al.'s (2004) operationalization of detail/specificity is valid: that specific memories are the most detail-rich kind of autobiographical memory and that to retrieve these kinds of memories puts unique constraints on areas of the brain that are involved in working memory, self-relevance processing and the organization of sensory-perceptual information stored in long-term memory. Nevertheless, the findings of Addis et al. (2004) suggest that it is important to code for episodic detail and not just specificity, as effects that can seem to be attributable to specificity may instead be attributable to the rich episodic detail that is often, but not always, a feature of specific memories. As we have previously shown, it is possible to be rich in episodic detail and yet not refer to a temporally specific event (Hallford, Ricarte, & Hermans, 2021). However, considering the neural processes involved in memory retrieval says little about why some people have reduced or enhanced autobiographical memory specificity or detailedness. Importantly, our brains are not static from birth. Instead, they mature through the early years of our lives and this development can be influenced by the social world in which we live. As such, it is worthwhile to consider the evidence for developmental changes in autobiographical memory and what this tells us about the relations between autobiographical memory specificity and detailedness.

3.2 | Developmental changes in autobiographical memory

Lam et al. (2022) conducted an investigation whose methodology (i.e., the use of the AMT) closely mirrored that of Hallford, Ricarte, and Hermans (2021) but included a sample of early adolescents (aged approximately 13 years old) from the community. They replicated many of the findings of Hallford, Ricarte, and Hermans (2021): that participants who retrieved more specific memories were also more detailed in their memories and that specific memories were more detailed than non-specific memories. However, another study among 16-year-old community adolescents (Salmon et al., 2021) found disagreement with these findings and those of Hallford, Ricarte, and Hermans (2021) but replicated some of the findings of Kyung et al. (2016).

Salmon et al. (2021) found weak and non-significant correlations between specificity measured using the AMT and the amount of episodic and semantic detail that participants included when describing a single important, turning-point event from their past. Their analysis also did not support the finding of Hallford, Ricarte, and Hermans (2021) that people who retrieve more episodic detail also retrieve more semantic detail. However, their analysis also included a second assessment timepoint a year later. Interestingly, participants became more specific over time and by Time 2 there was a significant negative correlation between the number of non-specific memories that participants reported, and the amount of episodic detail reported in their turning point narrative ($r = -0.19$). At Time 2, the correlation with specific memories was similar in size ($r = 0.15$) but non-significant. Similarly sized correlation coefficients were present in Hallford, Ricarte, and Hermans (2021) and Lam et al. (2022), however, their sample sizes were considerably larger, suggesting that Salmon et al. (2021) was not sufficiently powered to detect significant effects for specific memories. Nevertheless, the directions of these effects were in line with those of Hallford, Ricarte, and Hermans (2021) and Lam et al. (2022) whereby people who were more specific and less non-specific reported more episodic detail in their memories.

The differences between Lam et al. (2022) and Salmon et al. (2021) may also be attributable to methodology. Lam et al. (2022) used a similar cross-sectional AMT-design as Hallford, Ricarte, and Hermans (2021) whereas Salmon et al. (2021) asked participants about a single turning point narrative within their longitudinal design. The unique features of the latter design offers valuable insights into developmental changes in the way that people recall and describe important autobiographical experiences. Several studies, including that of Salmon et al. (2021), have shown that both episodic and semantic detail and the retrieval of specific memories all improve across adolescence and into early adulthood (Ogle et al., 2013; Piolino et al., 2007; Willoughby et al., 2012). Moreover, in that study, the relationship between episodic detail in a highly self-relevant narrative and emerging psychopathology was the opposite to the expected pattern: more detail predicted increased depressive symptoms over time, not less (Salmon et al., 2021). The transition through adolescence is a critical period for the development of the self as we move away from our parents and toward peer relations and increasing diversity and complexity in our social roles (Pfeifer & Berkman, 2018). At the same time as we are developing the neurocognitive tools to be able to encode and retrieve specific instances from our own personal past in increasingly rich detail, the transition through adolescence and into adulthood, and this drive toward peer relations, gives us the social motivation to use important, specific, detailed past experiences to define who we are to others (Habermas & Bluck, 2000). As such, the association between specificity and detail may change across development, especially when people are asked to recall specific important instances from their past rather than multiple mundane instances as in Lam et al. (2022). Further changes in the association between specificity and detail may also occur later in life given that as we progress into old age semantic memory becomes more important than episodic memory (Levine et al., 2002; St Jacques & Levine, 2007). Interestingly, Salmon et al. (2021) suggest that there may be some similarities between the differences in autobiographical memory that are seen between stages of development and the differences that are seen between cultural contexts. The processes of encoding and retrieval of autobiographical memories therefore do not occur within a vacuum but instead occur within our sociocultural context. We might therefore ask how the detail and specificity of our autobiographical memories is influenced by the social world in which we live and how they can in turn influence that world.

3.3 | The social role of autobiographical memory

The detail we share in our autobiographical narratives and the specificity of the memories we share are both related to the way that our parents talk to us. In particular, people's whose parents engage in elaborative reminiscing are themselves more likely to report detailed, specific memories (Reese et al., 1993; Salmon & Reese, 2016; Valentino et al., 2014). To our knowledge, no study has yet delineated whether social factors can differentially influence episodic

detail versus specificity. There is evidence that the context of retrieval can influence specificity such that participants in a more social, interview context retrieve fewer specific memories than those who are cued within a non-social, computerized task (Bunnell et al., 2020), however, to our knowledge no study has yet examined whether similar or different effects are also present for detail. Nevertheless, there is evidence that the detail and specificity of our autobiographical memories can have unique influences on other people.

The sharing of detailed autobiographical memories enables people who are listening to our memories to relate to them (Schank & Abelson, 1995) and it can enhance positive mood (Pasupathi & Carstensen, 2003) and boost people's feelings of intimacy and warmth with other people (Alea & Bluck, 2007). Each of these effects helps us to use our memories to achieve our interpersonal goals (Pillemer, 1992). Similar findings have emerged following the sharing of specific autobiographical memories (Barry, Vinograd, et al., 2019; Beike et al., 2016). Barry et al. (2022) subsequently examined whether people would be more or less willing to offer support to other people who shared detailed and/or specific autobiographical memories. They found consistent evidence that people offer greater support to people who share more episodic detail in their autobiographical memories. Although the effects for specificity were less consistent, they presented evidence that people also offer more support to people who share specific, compared to non-specific, autobiographical memories. Importantly, these effects were independent of the effects of episodic detail.

These findings that there are social influences on the detail and specificity of our autobiographical memories and that both detail and specificity can have similar, and perhaps unique, effects on other people further support the suggestion that specificity and detailedness are separable but related constructs. There may also be important cultural processes that influences the specificity and detail with which people encode their autobiographical experiences and share them afterwards.

3.4 | Culture and autobiographical memory

Evidence suggests that European and European American people report more specific and detailed autobiographical memories than Asian and Asian American participants (Humphries & Jobson, 2012; Wang et al., 2011). Consistent with these findings, in the study by Hallford, Ricarte, and Hermans (2021) the United States and Belgian samples were more specific and reported more episodic detail than Hong Kong and Japanese samples. However, there were methodological differences across sample sites, preventing us from drawing robust conclusions about cultural differences. These findings offer additional, albeit tentative, support to a close association between specificity and episodic detailedness given that they suggest that cultures that are more specific are also more detailed. These cultural differences are likely to be due to a range of factors such as cultural differences in parent–child reminiscing practices, the emphasis placed on independence and unique experiences, and differences in emotion knowledge and processing (Wang, 2009). Put otherwise, societies that emphasize independence and emotional experience may facilitate the encoding and retrieval of specific autobiographical events that are rich in episodic and emotional detail compared to societies that place greater emphasis on interdependence and shared experience and which also place less emphasis on individual emotional experience and regulation (Wang et al., 2018). This may have indirect effects on mental health how it affects peoples' willingness to support others if they share memories that do or do not conform to their culture preferences for specificity and detail (e.g., Barry et al., 2022; Barry, Vinograd, et al., 2019). That notwithstanding, there is a wealth of evidence related to the direct association between both autobiographical memory specificity and detailedness and psychopathology.

3.5 | Autobiographical memory and psychopathology

A body of research has established the association between reduced autobiographical memory specificity and the presence of psychiatric diagnoses (Barry et al., 2021), change in the symptoms of depressive disorders over time (Hallford, Rusanov, et al., 2021), and the persistence of these autobiographical memory problems even when depression has remitted (Hallford, Rusanov, et al., 2022). Some of the studies presented here have also found supporting evidence for this with weak but significant negative correlation between the number of specific autobiographical memories that people can retrieve and the severity of their depression symptoms (Hallford, Barry, et al., 2021; Kyung et al., 2016). However, both studies in this area that have involved community adolescents, for whom the level of depressive symptoms was low, found non-significant correlations between specificity as assessed by the AMT and depression (Lam et al., 2022; Salmon et al., 2021).

There is comparatively less research that has explored the association between autobiographical memory detail and psychiatric diagnoses or symptoms, and that which exists is far less consistent than that for autobiographical memory specificity. Studies in psychiatric groups, such as those with diagnoses of schizophrenia or Major Depressive Disorder, typically include fewer episodic details in their autobiographical memories than diagnosis-free controls (Corcoran & Frith, 2003; Potheegadoo et al., 2012; Söderlund et al., 2014). Söderlund et al. (2014) additionally found that this relative impairment does not extend to semantic details. The meta-analysis of Hallford, Ricarte, and Hermans (2021) suggested that, despite some inconsistencies across the sample sites, people who shared more episodic details reported having less severe depression symptoms. However, contrary to this, both Kyung et al. (2016) and Salmon et al. (2021) reported positive correlations between episodic detail and depression symptoms. Kyung et al.'s (2016) findings also extended to other process measures that are conceptually related to depression. For example, they found that people who retrieved more details within their specific memories also reported that they ruminated more and are more emotionally reactive. This conflict may be because both Kyung et al. (2016) and Salmon et al. (2021) involved diagnoses-free participants with relatively low levels of depression symptoms. Future research could examine whether the direction of the association between detail and depression is a function of diagnostic status. In particular, studies could explore whether more episodic detail is associated with greater depression severity in community groups and yet whether lower episodic detail is evident among people with depression diagnoses when compared to community groups.

The same is unlikely to be true for semantic detail. In line with evidence that the amount of semantic detail reported within memories does not differ between people with and without depression diagnoses (Söderlund et al., 2014), Hallford, Ricarte, and Hermans (2021) and Lam et al. (2022) also reported non-significant associations between depression symptoms and semantic detail.

Interestingly, there is evidence that some of these effects may not be transdiagnostic. In line with suggestions that autobiographical memory specificity may not be strongly associated with the presence of anxiety (Barry et al., 2021), Kyung et al. (2016) also reported a non-significant correlation with anxiety symptoms. However, Moscovitch et al. (2018) found that people with Social Anxiety Disorder reported significantly more episodic detail in their memories for aversive events than diagnoses-free controls, whereas there was no group difference for the amount of detail included in their memories for non-aversive events. Future studies should examine whether an association is only evident between detailedness, and indeed specificity, when anxiety-relevant memories are evoked. Some evidence for this comes from a recent meta-analysis of the correlation between anxiety and self-reported level of detail in autobiographical future thinking (Du et al., 2022), which found that higher anxiety was related to higher detail for negatively-valenced cues. This is, however, not the only possible future direction for research in this area.

4 | FUTURE DIRECTIONS

4.1 | Measures and procedures

As noted at the beginning of this review, the instructions that we give to participants (e.g., whether or not they are asked to retrieve a specific memory) and the cues (e.g., nouns/adjectives vs. life periods) used to elicit memories can have important implications for the kinds of autobiographical memory that are retrieved and whether we are measuring the tendency or ability to retrieve these memories. Furthermore, the context of retrieval, such as whether it occurs within a more or less social context, can also influence retrieval (Bunnell et al., 2020). Future research should use these different procedures to examine the conditions under which specificity and detail converge and diverge. For example, are specificity and detail both similarly compromised when retrieving memories in social versus non-social contexts; is the *ability* to retrieve specific, high detailed memory, when explicitly instructed to do so correlate with the *tendency* to retrieve such memories when minimal instructions are given. Future research should also consider the cues that are given and the memories that they elicit.

4.2 | Emotion

Beyond a consideration of the amount of semantic and episodic detail within autobiographical memories, there are additional features of these memories that might be important. One example is the degree to which these memories are emotionally evocative. In this regard, one notable finding that has yet to be followed up on was the moderating role of

emotionality on the association between specificity and detailedness (Roberts et al., 2018). In addition to their finding that people's recall of specific autobiographical memories and episodic details follow opposing curvilinear trajectories, they also found that when memories were emotional in content, the trajectories for retrieval of specific memories and the amount of detail included in these memories began to converge such that people were more detailed when they were more specific (Roberts et al., 2018). These findings suggest that emotion may have a role in coupling specificity and detail more strongly together as characteristics of memory. To our knowledge, no other study in this area has examined whether the presence or absence of emotion can influence specificity/detail or whether this differs as a function of age or clinical status (St Jacques & Levine, 2007). There may also be valence-specific effects such that specificity and detail are similarly or differentially influenced by positive versus negative cuing or that the specificity and/or detail of negative versus positive memories is differentially affected among people with psychiatric diagnoses (e.g., Barry, Del Rey et al., 2019; Janssen et al., 2015). Future studies in this area could further examine the intersection between emotion, psychopathology and autobiographical memory.

4.3 | The detail and organization of autobiographical memory

We might also broaden our analysis of detail beyond simply counting the kinds of information within memory responses to focus on the organization of these details within autobiographical memory. In this respect the narrative identity literature is instructive given its advances in this area. In these studies, people are typically asked to describe a single personal experience in as much detail as possible, as in Salmon et al. (2021).

Several models have emerged that offer potentially valuable ways to quantify the coherence of autobiographical memory. Like Holland et al.'s (2011) suggestion that it is not detail per se that is important but the organization of detail, Reese et al. (2011) proposed that we can consider the coherence of a memory or narrative. Put otherwise, we can quantify an autobiographical memory in terms of whether it includes information about when and where events took place (contextual coherence), whether these details are presented in a logical and chronological manner (chronological coherence), and whether the events described involve an emotional highpoint and resolution (thematic coherence). As Vanderveren et al. (2017) highlight, there is substantial overlap between the concepts of memory coherence and autobiographical memory specificity given that reference to specific times and places characterizes contextual coherence (Reese et al., 2011). As they later showed, the ability to describe past experiences in a coherent manner was related to the ability to retrieve specific autobiographical memories (Vanderveren et al., 2019). This positive association was also true not just for contextual coherence but also chronological and thematic coherence. In addition, they showed that the coherence with which negative events were described was negatively associated with depressive symptoms even when accounting for the variance that was explained by memory specificity (Vanderveren et al., 2019).

There may also be similar findings for narrative variables such as coherence, as are present for other autobiographical memory variables, and their relations with psychopathology and wellbeing. For example, Mitchell et al. (2020) found that greater causal coherence in adolescents' life turning points predicted lower psychopathology and greater life satisfaction over 1 year (Mitchell et al., 2020). The self-reported perception of more causal coherence across a person's autobiographical memories has also been found to be related to lower depressive symptoms at follow-up (Hallford, Ricarte, & Hermans, 2021). In addition, social effects have also been reported for memory coherence in terms of increasing listeners' preferences and willingness to support others who share their memories in coherent ways (Vanaken et al., 2020; Vanaken & Hermans, 2021), similar to findings for episodic detail (Barry et al., 2022). These findings suggest that coherence and specificity are related, and that the coherence with which the details of our memories are presented is important too. This may be because coherence captures not just autobiographical memory performance but also the extent to which we have made sense of the events in our lives, and whether we have extracted some broader meaning from them.

Relatedly, McAdams and McLean (2013) highlight other narrative qualities that are associated with wellbeing, such as the extent to which our memories include details related to our ability to affect change (agency), our connections with others (communion) and the positive resolutions (redemption) and lessons learnt (meaning making) from our experiences. Adler et al. (2016) offers a consolidated framework for considering these narrative variables along with aspects of autobiographical narratives related to coherence or structure. They suggest that our narratives are comprised of motivational themes (e.g., agency, communion, etc.), affective themes (i.e., the affective tone of the narrative), themes related to meaning making, and structural and organizational elements. Adler et al. (2016) presents evidence for the associations between these elements and emotional wellbeing. Each of these elements is a function of the episodic and semantic detail that is retrieved and the ways in which they are presented.

However, to our knowledge, very little research has directly examined the association between typical autobiographical memory variables such as specificity or detail and these narrative elements or whether each of these variables differentially or incrementally predict psychopathology or other associated processes. Salmon et al. (2021) suggests that such an analysis may be fruitful as their study included both episodic detail and meaning making (lessons that were learned) in their study of community adolescents' turning point memories. They found that the extent to which adolescents' narratives included a negative implication for the self was a unique predictor of variance in depressive symptoms concurrently and across 1 year, in addition to greater episodic detail. That is, both cognitive (detailedness) and narrative (the valence of the lesson learnt) variables were significant and unique predictors of depressive symptoms.

4.4 | Computerized algorithms for coding memories

There are also potentially fruitful future directions regarding not what we code, but how we code our memories. There may be some variability in the coding procedure across different coders and labs, which may have contributed to, apart from the above-mentioned factors, the heterogenous findings in the research area. Automating the coding process is expected to resolve this issue, and several attempts have been made to achieve this over the past 5 years.

Peters et al. (2017) selected linguistic text features (e.g., number of nouns, verbs) from German-written memories and put these features in a series of regression models to predict the number of internal/episodic details within a memory. They concluded that their models showed reasonable accuracy in the predictions. Takano et al. (Takano et al., 2017; Takano, Gutenbrunner, et al., 2018; Takano, Hallford, et al., 2018) identified words and phrases often used in specific and non-specific memories for the AMT, on which a support vector machine was trained to predict memory specificity. They found that the prediction accuracy of the model against human raters was good (around 80%–85%) across different languages and populations (Dutch, English, and Japanese; Adults and children). Most recently, van Genugten and Schacter (2022) used a machine learning technique (i.e., Transformer with distilBERT) to predict the amount of internal/episodic and external/semantic details in English-written memories. They found that the model's predictions were highly correlated with the human-coded internal/external (episodic/semantic) details.

These promising new computational tools will pave the way to standardization of the coding schemes used within autobiographical memory research and will enable researchers to conduct research in much larger samples than has been possible to-date. However, this research is not without limitations. Language differences—and even differences between dialects within a given language—are still a potential challenge (e.g., a model trained on English-written memories cannot be used for memories in Dutch). Another issue is that it is typically difficult to interpret the internal structure of a model trained through a machine learning approach, and thus, the fact that we have models with good prediction accuracy does not mean that we know how specificity and detailedness are defined linguistically and psychologically—the text features that the models use to make their predictions are not the same as those which human raters use. Researchers have also yet to develop algorithms for quantifying other autobiographical memory qualities, such as their coherence. Although this may be possible, several challenges are apparent. Future research could consider developing (or tuning) a text segmentation technique specific to autobiographical memory (Pak & Teh, 2018). This process splits a written memory into meaningful parts (segments), which allows us to computationally define how a story unfolds. Also, we would need a coherency metric to capture how consistent the identified segments are, which may be implemented by the cosine similarity or more complex methods (e.g., Chen et al., 2020).

4.5 | Intervention

Finally, it is imperative that we consider the implications of the findings presented here for interventions that aim to improve autobiographical memory among groups of people who otherwise struggle retrieving memories of past events. Perhaps the most common such intervention is Memory Specificity Training (MeST; Raes et al., 2009). Although MeST is ostensibly concerned with improving autobiographical memory specificity, the exercises within a typical MeST protocol achieve this by encouraging participants to retrieve any kind of episodic detail associated with an autobiographical event as a way of not only aiding the retrieval of specific events but also their reliving once retrieved. Indeed, one study that pre-dates the first publication of MeST, but which used a similar intervention, even rewarded participants by giving them points for each episodic detail that they retrieved during the intervention (Blairy et al., 2008). And yet, to our knowledge, although MeST is effective at improving autobiographical memory specificity (Barry, Sze, & Raes, 2019), no

study has examined whether MeST leads to improvements in episodic detail. The nature of the MeST protocol also seems to imply that any such improvement in episodic detail would also mediate improvements in specificity and yet, to our knowledge, this has also not been tested. However, evidence from similar experimental studies using the Episodic Specificity Induction (ESI)—where participants are shown a video of a fictitious event and are then asked to think about it with high levels of episodic detail—suggests that such manipulations can improve the amount of episodic, but not semantic, detail that people retrieve when thinking about real autobiographical events from their past, as well as possible events in their future (Madore et al., 2014; Madore & Schacter, 2016). Future studies of MeST and other similar memory interventions (e.g., Memory Flexibility Training; Hitchcock et al., 2018) must now measure episodic and semantic detail and examine the association between improvements in these variables and autobiographical memory specificity as well as (current and prospective) diagnostic status and symptoms. Further, in light of findings that greater detail is sometimes related to higher psychopathology, further research is necessary to clarify the conditions under which high versus low detail is a harbinger of psychological problems.

5 | CONCLUSION

Autobiographical memory specificity and detailedness are related but separable constructs. The retrieval of a specific autobiographical event from our past necessitates that we retrieve at least one episodic detail that makes it possible to determine that the event took place on a single day in our past. And yet, it is possible to retrieve a specific event that is low in episodic detail, and a non-specific event that is very rich in episodic detail. From a neural perspective, there is evidence that the retrieval and reliving of specific autobiographical memories is associated with a unique pattern of neural activation, compared to non-specific but detailed memories. In addition, there is some evidence that specificity and detailedness may be differentially, and perhaps independently, associated with outcomes such as the symptoms of psychiatric diagnoses. Nevertheless, evidence from research that compares different cultures and age groups further supports the suggestion that specificity and detailedness are related as age groups and cultures that are more specific typically also show evidence of being more detailed in their retrieval of their memories also.

There is still much research that must be done to further elucidate the association between autobiographical memory specificity and detailedness, and particularly the circumstances in which their association is strengthened or weakened, such as when thinking about emotional memories, the nature of the population (clinical vs community) being studied and of the task (a highly self-relevant narrative vs a cued recall task) used to elicit memories.

We draw emphasis to the apparent importance of episodic detail and its unique predictive function within psychopathology and elsewhere to illustrate that the current skew toward the measurement of autobiographical memory specificity within the field of psychopathology may be unjustified. Despite the evidence that episodic detailedness may be unique associated with psychopathology, there is relatively little consideration within the available literature regarding whether the detail with which we retrieve and think about our autobiographical past can influence our mental health.

However, we do not wish to make the point that research should now solely focus on quantifying the amount of episodic detail within memories. Our hope is to emphasize that researchers could be considering much more than just whether a memory refers to a specific event. Instead, there should be more focus on whether people are able to retrieve memories that are rich in episodic and semantic detail, the ways in which these details characterize more complex narrative themes (e.g., details related to agency, communion, etc.) and whether these details are structured and reported in a coherent manner (i.e., narrative coherence). As the evidence presented here indicates, autobiographical memory specificity correlates with a number of other features within autobiographical memory, and this may in turn explain why it is often associated with psychopathology. It is also possible that this association is because each of these features exist within a single whole related to what constitutes strong or poor autobiographical memory. This is similar to Levine et al.'s (2002) continuum of specificity and detail. Put otherwise, some people may be able to easily retrieve memories of specific events that are rich in episodic detail, that include narrative themes related to agency, communion, resolution, and so forth and which are presented in a coherent and organized way. It is possible that other people may do this with less consistency, occasionally retrieving memories with only some or none of these features. It is also possible that autobiographical memory performance may not just differ between individuals but also within them, such that the richness with which we retrieve and share our memories differs across moments and contexts, depending on the function that they are intended to serve for us at a given time (Waters et al., 2014).

To adequately capture specificity, detail and narrative elements related to theme and structure, we may need to broaden our methodology, moving away from the traditional Autobiographical Memory Test (AMT) to paradigms that

stress the importance of thinking about important events from the past and giving people the time and encouragement to share these memories in as much detail as possible. We may also need to broaden our theoretical lens to incorporate rich findings from both neurocognitive (Schacter et al., 2012) and narrative (McAdams & McLean, 2013) perspectives. By considering the kinds of details that are included in our memories and the ways in which they are organized, we might fully realize the contribution of autobiographical memory to the presence and severity of mental health problems. We might then also use this knowledge to continue to develop, and improve the assessment of, interventions that are designed to improve autobiographical memory.

AUTHOR CONTRIBUTIONS

Tom J. Barry: Conceptualization (equal); visualization (equal); writing – original draft (lead); writing – review and editing (equal). **Keisuke Takano:** Conceptualization (equal); visualization (equal); writing – original draft (supporting); writing – review and editing (equal). **David Hallford:** Conceptualization (equal); visualization (equal); writing – original draft (supporting); writing – review and editing (equal). **John Roberts:** Conceptualization (equal); visualization (equal); writing – original draft (supporting); writing – review and editing (equal). **Karen Salmon:** Conceptualization (equal); visualization (equal); writing – original draft (supporting); writing – review and editing (equal). **Filip Raes:** Conceptualization (equal); visualization (equal); writing – original draft (supporting); writing – review and editing (equal).

CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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