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A test of the functional avoidance hypothesis in the development of overgeneral autobiographical memory

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Abstract

Overgeneral memory (OGM) refers to the failure to recall memories of specific personally experienced events, which occurs in various psychiatric disorders. One pathway through which OGM is theorized to develop is the avoidance of thinking of negative experiences, whereby cumulative avoidance may maladaptively generalize to autobiographical memory (AM) more broadly. We tested this, predicting that negative experiences would interact with avoidance to predict AM specificity. In Study 1 ($N = 281$), negative life events (over six months) and daily hassles (over one month) were not related to AM specificity, nor was avoidance, and no interaction was found. In Study 2 ($N = 318$), we revised our measurements and used an increased timeframe of 12 months for both negative life events and daily hassles. The results showed no interaction effect for negative life events, but they did show an interaction for daily hassles, whereby increased hassles and higher avoidance of thinking about them were associated with reduced AM specificity, independent of general cognitive avoidance and depressive symptoms. No evidence was found that cognitive avoidance or AM specificity moderated the effect of negative experiences on depressive symptoms. Our findings suggest that life events over 6–12 months are not associated with AM specificity, but chronic daily hassles over 12 months predict reduced AM specificity when individuals avoid thinking about them. The findings provide evidence for the functional-avoidance hypothesis of OGM development and future directions for longitudinal studies.

Keywords Overgeneral memory · Autobiographical memory specificity · Functional avoidance · CaR-FA-X · Daily hassles

Research over the past few decades has provided evidence that the process of retrieving autobiographical memories (AM) for personally experienced events is often done in a hierarchical and generative manner. This retrieval process tends to begin with more abstracted information about one's experience and progresses to contextual details of events that occurred on specific days in one's life (Conway & Pleydell-Pearce, 2000; Haque & Conway, 2001). A deficit in the voluntary retrieval of specific memories has been termed *overgeneral memory* (OGM), whereby individuals show a tendency to recall fewer memories of events that occurred within one day, and instead to recall more abstracted information, such as events lasting more than a day (extended memories; e.g., a summer semester at high school), repeated events (categoric memories; e.g., painting classes every Wednesday), or semantic associates (e.g., I'm a happy person).

It is now well understood that OGM is a cognitive marker of a range of psychiatric disorders, including clinical depression (Williams et al., 2007), posttraumatic stress disorder (Moore & Zoellner, 2007; Ono, Devilly, & Shum, 2016), and schizophrenia (Berna et al., 2016). A deficit in retrieving specific AM has been shown to be both a risk factor and a consequence of psychopathology (Sumner, Griffith, & Mineka, 2010). In addition to clinical groups, individual differences more generally in retrieving specific AMs are of importance, given that remembering particular experiences is crucial in adaptive processes such as planning, creativity, and problem solving (Dalgleish & Werner-Seidler, 2014). Knowledge of the development and causes of OGM may therefore be of great merit, given that it would inform models

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of cognitive functioning and psychopathology and guide interventions to modulate the ability to retrieve specific AM (e.g., Raes, Williams, & Hermans, 2009).

Williams and colleagues (Williams, 2006; Williams et al., 2007) have proposed three overlapping and interrelated mechanisms through which OGM might be caused, which they term the CaR-Fa-X model ("capture and rumination, functional avoidance, and executive functioning"). *Capture* refers to when the retrieval of AM becomes truncated at an intermediate, schematic level due to highly elaborated and salient personal concerns or self-representations that arouse emotion and attract attention. Relatedly, *rumination* at this level of retrieval may further elaborate personal concerns and self-representations, leading to further capture during this retrieval process. With respect to *executive functioning*, deficits in processes such as the monitoring of thoughts, inhibition of interfering cognitive information, and holding multiple bits of information in working memory may make generative retrieval less likely to end in the recall of specific memories, because, for example, irrelevant information might disrupt the search process.

The final mechanism through which OGM might manifest, and the focus of this article, is the *functional avoidance* of negatively valenced memories (Williams, 2006; Williams et al., 2007). As a means to regulate affect, individuals may avoid thinking of unpleasant events they have experienced that evoke negative affect. A small body of research has provided support for this affect-regulation model. A series of experimental studies have shown that individuals that retrieve more OGM show less subjective distress in response to negative stimuli (Raes, Hermans, de Decker, Eelen, & Williams, 2003; Raes, Hermans, Williams, & Eelen, 2006), and less-specific AM retrieval was found to be predictive of less emotional distress in a cohort of students who had failed at their exams (Hermans et al., 2008). A recent study in children also showed that using a deliberately overgeneral retrieval style for memories relating to negative cue words, relative to a specific style, was related to higher positive affect in the children, but this effect was not replicated in adults (Bunnell & Greenhoot, 2018). It is hypothesized that over time this regulatory response may become more pervasive and lead to the generalized tendency to retrieve memory in an abstracted way, regardless of its emotional valence. Indeed, evidence indicates that where OGM is manifest, such as in sufferers of clinical depression, this deficit applies to both negative- and positive-valenced experiences (van Vreeswijk & de Wilde, 2004). Therefore, although this means of affect regulation is initially adaptive, over time the development of habitual overgeneral retrieval becomes maladaptive and a risk factor for psychopathology (Bryant, Sutherland, & Guthrie, 2007; Gibbs & Rude, 2004; Sumner et al., 2010).

Although much research has focused on OGM as a feature (Williams et al., 2007) or as a predictor of psychopathology (Sumner et al., 2010), far less has focused on its development in the context of the functional avoidance of negative experiences. The development of OGM is theorized to occur over time (Williams et al., 2007) and as a result of cognitively suppressing thoughts of negative major life experiences. Therefore, rather than people just experiencing these negative events or having a generally avoidant coping style in isolation, the interaction of these two factors is thought to be important. Sumner (2012) summarized the etiological research and concluded that traumatic experiences, such as childhood abuse or adversity, may not be sufficient in isolation to cause OGM, although recent meta-analytic results have shown that they are associated with OGM (Barry, Lanaert, Hermans, Raes, & Griffith, 2018). On reviewing the literature on OGM in children and adolescents, Hitchcock, Nixon, and Weber (2014) also reported on significant associations between trauma and OGM; however, they noted that no research has been conducted in these age groups regarding how functional avoidance might be implicated in this association. Some factors have been identified that moderate the association between OGM and traumatic life experiences, such as a younger age of occurrence and longer duration (Burnside, Startup, Byatt, Rollinson, & Hill, 2004; Hermans et al., 2004). With respect to negative major life events in general, these factors have not been found to be predictive of reduced AM specificity (Gibbs & Rude, 2004; Hamlat et al., 2015). The results regarding the association between avoidant coping and AM specificity have been slightly more mixed, with some studies finding no association (Gibbs & Rude, 2004; Sumner et al., 2014), and others that higher avoidance is correlated with less specific AM (Hermans, Defranc, Raes, Williams, & Eelen, 2005) and is predictive of less specific AM when there is a perception of threat, relative to a neutral condition (Debeer, Raes, Williams, & Hermans, 2011). Assessing the interaction between the experience of negative life events and the avoidance of thinking of these events would be a truer test of the functional-avoidance hypothesis. To the authors' knowledge, no study to date has attempted this, which may account for the mixed findings from previous studies.

In addition to negative life events, it may be that daily hassles are a factor in the functional-avoidance mechanism of development. Note that here we also make a distinction, common in the literature, regarding negative life events and daily hassles, such that the former typically occur less often and are considered "major" events in life (e.g., divorce, imprisonment, starting a new job), whereas the latter might be considered relatively less significant or impactful in isolation, but can occur repeatedly or chronically (such as conflict with a co-worker, or too many household chores). Chronic daily stressors can elicit strong negative emotions and have been shown to be a superior predictor of psychological distress, relative to major life events (e.g., Kanner, Coyne, Schaefer, & Lazarus, 1981; Monroe, 1983). It is also possible that such experiences may also trigger an affect-regulation response in the form of cognitive avoidance. For individuals who habitually regulate in this manner, the result may be the development

of OGM, in a manner consistent with the avoidance of major life events. Although no studies have tested this hypothesis, some have examined the association between daily hassles and AM specificity. Anderson, Goddard, and Powell (2010) reported no significant association between daily hassles and AM specificity, but that AM specificity moderated the relationship between daily hassles and depressive symptoms. Sumner et al. (2011) reported that lower AM specificity predicted a greater risk of clinical depression when high levels of chronic interpersonal stress were reported. In contrast with Anderson et al., they found moderate correlations between chronic interpersonal and non-interpersonal stress and AM specificity. As we noted earlier, such findings speak to OGM as a risk factor for psychopathology, but they do not address the question of whether OGM might develop as a result of avoiding thinking about such daily hassles.

Over two studies, we aimed to test the functional-avoidance hypothesis of the development of OGM by surveying individuals for the experience of negative life events and daily hassles, and the degree to which they avoided thinking of these adverse experiences. In accordance with the functional-avoidance hypothesis, we predicted that the interaction between experiencing more negative life events and daily hassles and a higher avoidance of thinking about these experiences would be related to less-specific AM. As a secondary aim, we also sought to test the notion that OGM has an affect-regulation role. We predicted that more negative life events and daily hassles would be predictive of depressed mood, but that this association would be weaker in the context of the moderators of higher avoidance of thinking about them and lower AM specificity. We also tested a three-way interaction effect assessing these two moderators.

Study 1

Method

Participants

Participants were recruited from Amazon's Mechanical Turk. MTurk is a crowd-sourcing website that facilitates individuals to complete tasks in exchange for payment. Researchers advertise their study to registered MTurk "workers," who can then link to the study tasks and be remunerated for their time. MTurk participants have been shown to respond to surveys in a way that is comparable to other nonrandom recruitment methods (Chandler & Shapiro, 2016) and to provide psychometrically reliable and valid information on this platform (Paolacci & Chandler, 2014). Using G*Power 3.1.9.2 (Faul, Erdfelder, Buchner, & Lang, 2009), we estimated that at least 250 participants would be needed to detect a small effect size for the interaction term in the main analysis of the functional-avoidance hypothesis with a power of .80 and an alpha level of .05. In total, 324 participants were recruited. After data cleaning and the removal of participants who completed the survey twice or had clearly completed it erroneously (e.g., all responses the same), the sample used for the analyses consisted of 281 participants (61.7% female) with a mean age of 36.9 years (SD = 11.5). All participants were residing in the United States of America. The majority of the sample identified as Caucasian (81.3%), with small numbers identifying as Asian (7.6%), Latino or Hispanic (4.5%), African American (3.8%), or other ethnicities (2.8%). The majority had either a bachelor's degree (48.4%) or postgraduate qualification (15.6%), and the remainder had a diploma or certificate (20.1%) or had finished high school (15.9%) as their highest educational achievement. The majority of the participants were employed, either full-time (64.7%), part-time (16.3%), or casually (9%), and 22.5% reported currently studying.

Measures

Major life events The Life Experiences Survey (Sarason, Johnson, & Siegel, 1978) was used to assess the occurrence of major life events and their subjective impact. Participants were asked to endorse whether they had experienced one of 45 different events over the last six months (e.g., a death in the family, borrowing large quantities of money, losing their job etc.), and space was given for participants to list an additional five events that may have been impactful but not captured in the prescribed list. Some items were altered to represent modern and easier to interpret language (e.g., "Reconciliation with girlfriend/boyfriend" was changed to "Making up or getting back together with girlfriend/boyfriend"). The participants were asked to indicate the impact that this event had on them using a rating scale from – 3 (*Extremely negative*) to + 3 (*Extremely positive*). Given our interest was in the events that impacted negatively, we recoded the data so negatively impacting events were rated from 1 (*low negative impact*) to 3 (*high negative impact*), and positively impacting and neutrally impacting events were coded as 0. We summed these items to obtain a scale on which higher scores indicated more, and more impactful, negative events over the last six months. The Cronbach's alpha for these items was .74. In addition to this, participants were asked to rate how much they avoided thinking about each event that was experienced using a rating scale from 0 (*I don't avoid thinking about it*) to 10 (*I completely avoid thinking about it*). The avoidance ratings for the negative events were summed, with higher scores indicating more avoidance of thinking about these events. The Cronbach's alpha for these items was .67.

Daily hassles The Survey of Recent Life Experiences, short-form version (Kohn & Macdonald, 1992), was used to assess daily hassles. Participants were asked to indicate to what degree 41 different daily hassles had been a part of their life over the past month, using a 4-point Likert scale ranging from 1 (*not at all a part of my life*) to 4 (*very much as part of my life*).

Examples of these daily hassles were "not having enough leisure time," "dissatisfaction with work," and "gossip about yourself." These items were found to have high internal reliability (Cronbach's alpha = .97). Participants were asked to rate how much they avoided thinking about each daily hassle using a rating scale from 0 (*I don't avoid thinking about it*) to 10 (*I completely avoid thinking about it*). The avoidance ratings were summed to create a total score, with higher scores indicating more avoidance of thinking about the events. The internal reliability of these items was high (Cronbach's alpha = .94)

Autobiographical memory specificity An online version of the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986) was used. The AMT requires individuals to retrieve AM in response to a series of cue words. In this study the participants were not explicitly advised to recall specific AMs, but rather just to recall a personal event from their life that could not be from the past week or have been mentioned multiple times. They were asked to state as many details as they could in relation to the event but were not given a definition of a specific AM or practice cues. Given that "minimal" instructions for the AMT such as this do not request specific AM, they might be considered a measure of the tendency to retrieve less specific memories. Therefore, they may be more ecologically valid as specific autobiographical memories may not be predominantly elicited under explicit instructions in everyday life. Further, this type of AMT instruction has been found to be more sensitive to individual differences in nonclinical samples, such as ours, relative to "explicit" AMT in which proportions of specific memories are typically very high (Debeer, Hermans, & Raes, 2009; Griffith et al., 2009). Therefore, this higher variance in the types of AM retrieved might improve our ability to detect any effects of interactions between negative life experiences and cognitive avoidance of them. Following the instructions, a series of ten cue words, taken from Heron et al. (2012), were presented that alternated between positive and negative valence: excited, bored, happy, failure, lucky, hopeless, relaxed, lonely, relieved, and sad. There was no time limit on how long participants had to respond to each cue word. The responses were coded as a specific or nonspecific AM. A subset of 200 AMT responses were coded by the first author and another researcher not associated with the study. Intraclass correlation coefficients were calculated, and showed good agreement, ICC = .83. The first author coded the remaining responses. The scores were summed and reported as the proportion coded as being specific AM.

General cognitive avoidance In addition to the avoidance of specific events and hassles, we sought to measure and control for the general disposition for cognitive avoidance, as this may also account for some variance in AM specificity. The Cognitive Avoidance Questionnaire (CAQ; Sexton & Dugas, 2008) was used to assess the general disposition to avoiding upsetting or negatively valenced cognitions. The CAQ has 25 items in total, which are distributed across five subscales representing different cognitive avoidance strategies (thought suppression, thought substitution, distraction, avoidance of threatening stimuli, and transformation of images into thoughts). For each item, participants indicated how typical it was for them to use the stated avoidance response, using a 5-point Likert scale from 1 (*not at all*) to 5 (*completely typical*). The items on all subscales were totaled in the present study, with higher scores indicating more cognitive avoidance in general. The CAQ correlates strongly with other measures of thought suppression (Sexton & Dugas, 2008), and had good internal reliability in the present study (Cronbach's alpha = .97).

Depressive symptoms The seven-item Depression subscale from the short-form version of the Depression, Anxiety, and Stress Scale (DASS; Lovibond & Lovibond, 1995) was used to assess for symptoms of clinical depression. Participants responded to items by indicating the presence of symptoms over the last week, using a 4-point scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). This scale possesses good psychometric properties and correlates very highly with longer measures of depressive symptoms (Antony, Bieling, Cox, Enns, & Swinson, 1998). Good internal reliability of the items was found in the present study (Cronbach's alpha = .91). For descriptive purposes, we report the DASS Anxiety subscale, which was also administered; it showed a mean score of 3.4 (*SD* = 4.3) and was internally reliable (Cronbach's alpha = .87).

Procedure

Ethics approval was obtained from the university human research ethics committee prior to commencement of the study. After electing to take part on the MTurk website, participants were taken to an external website that hosted the study survey. Here they were presented with a plain-language statement and then prompted to provide demographic information and complete the study questionnaires. Informed consent was implied by completion and submission of the questionnaire. Participants were compensated for their time with a nominal sum of US$1.

Data analytic strategy

All analyses were conducted using SPSS 24.0. Descriptive statistics and Pearson correlations were generated for the study variables. The scores for the impacts of negative events and daily hassles, both corresponding avoidance measures, and depressive symptoms were all highly positively skewed. Given this, these variables were logarithmically transformed prior to analyses to attain a normal distribution. To test the main hypotheses, moderated multiple-regression models were conducted using an SPSS macro created by Hayes (PROCESS;

Hayes, 2012). A bootstrapping approach was used, which is a nonparametric approach to estimating effect sizes and testing hypotheses. Bootstrapping was conducted with 5,000 samples, and bias-corrected 95% confidence intervals were generated. The variables were mean-centered before being entered into the model. The PROCESS macro implements a procedure to ensure heteroscedasticity-consistent standard errors. We included measures of general cognitive avoidance (the CAQ) and depressive symptoms (DASS Depression subscale) in order to partial out confounding effects they might have had on AM specificity. Where interaction effects were significant, we conducted simple-slope analyses to examine the effects at different levels of the moderator (mean and one standard deviation above and below). We also used the Johnson–Neyman technique (Johnson & Fay, 1950), as described by Hayes and Matthes (2009), to probe for the region of significance on the moderator.

Results

Descriptive statistics and zero-order correlations between the study variables are reported in Table 1. As these indicate, AM specificity did not correlate significantly with any of the other variables. The avoidance of thinking about life events and daily hassles correlated with general avoidance to a small to moderate degree.

Functional avoidance hypothesis

To test our first hypothesis, we entered the impact of events, avoidance of events, and the interaction term as predictors in the regression equation. The model did not significantly predict AM specificity, $r = .16$, $R^2 = .02$, $F(5, 275) = 1.7$, $p = .118$. As is indicated in Table 2, the impact of negative events was an independent predictor of lower AM specificity; however, no other predictors were, and the interaction was nonsignificant.

The functional-avoidance hypothesis predicts that the avoidance of negative or distressing experiences will be predictive of the development of OGM. We sought to test the specificity of this rationale (outlined by Williams, 1996; Williams et al., 2007) by assessing whether cognitively avoiding positive experiences might predict lower AM specificity, and therefore provide a preliminary check on the boundary conditions of the functional-avoidance hypothesis. We tested the model again using the impact of events rated as positive and the avoidance of thinking about these positive events. The resulting model did not significantly predict AM specificity, $r = .12$, $R^2 = .01$, $F(5, 282) = 0.9$, $p = .470$, and none of the predictors were statistically significant (all ps > .218).

The regression analyses were then repeated using daily hassles as the focal predictor and avoidance of thinking about daily hassles as the moderating variable. The resulting model did not significantly predict AM specificity, $r = .11$, $R^2 = .01$, $F(5, 280) = 0.73$, $p = .596$, and none of the variables were significant predictors (see Table 2).

To assess whether general cognitive avoidance might moderate the relationship between the experience of events or hassles and AM specificity, we conducted two further regressions, with CAQ scores as the moderator instead of specific avoidance and retaining depressive symptoms as a covariate. Neither the model containing negative life events, $r = .15$, $R^2 = .02$, $F(4, 284) = 1.03$, $p = .158$, nor the model with daily hassles, $r = .12$, $R^2 = .01$, $F(5, 284) = 1.17$, $p = .321$, significantly predicted AM specificity, and none of the variables in the models were significant predictors (all ps > .05). This indicated that the general tendency to avoid negative cognitions did not moderate the impact of events or hassles on AM specificity.

Affect-regulation function of OGM

Analyses were conducted in the same manner as above, although depressive symptoms were used as the dependent variable. The first model tested included the impact of events as the focal predictor, avoidance of events and AM specificity as two moderators, and the two- and three-way interaction terms

Table 1 Descriptive statistics and zero-order correlations between the Study 1 variables

	Specific AM	Impact of Negative Events	Avoidance of Negative Events	Daily Hassles	Avoidance of Hassles	CAQ	DASS-D	Mean (*SD*)
Specific AM	–							.54 (.19)
Impact of Negative Events	– .09	–						0.15 (0.22)
Avoidance of Negative Events	– .02	.83***	–					0.31 (0.43)
Daily Hassles	– .08	.50***	.43***	–				1.5 (0.44)
Avoidance of Hassles	– .02	.19**	.25***	.32***	–			3.4 (2.2)
CAQ	– .05	.37***	.37***	.56***	.41***	–		2.5 (1.0)
DASS-D	– .09	.50***	.45***	.56***	.21***	.53***	–	4.5 (5.4)

CAQ = Cognitive Avoidance Questionnaire Total Score, DASS-D = Depression Subscale of the Depression, Anxiety, and Stress Scale. Specific AM reported as proportion of specific responses on the Autobiographical Memory Test. Impact of negative events and daily hassles, both corresponding avoidance measures, and DASS-D are logarithmically transformed. ** $p < .01$, *** $p < .001$.

Table 2 Study 1 results of moderation analyses testing the functional avoidance hypothesis with AM specificity as the dependent variable

	B	*SE*	*t*	*p*	L.C.I.	U.C.I.
Negative Life Events						
Constant	5.7	0.33	17.1	<.001	5.1	6.4
Impact of Negative Events	– 0.96	0.46	– 2.06	.039	– 1.9	– 0.04
Avoidance of Negative Events	0.67	0.36	1.9	.061	– 0.03	1.38
CAQ	– 0.01	0.001	– 0.31	.757	– 0.01	0.01
DASS-D	– 0.22	0.32	– 0.70	.481	– 0.85	0.40
Impact × Avoidance	– 0.36	0.39	– 0.93	.354	– 1.1	0.40
Daily Hassles						
Constant	5.5	0.39	14.1	<.001	4.7	6.3
Daily Hassles	– 0.47	1.3	– 0.35	.723	– 3.1	2.1
Avoidance of Hassles	0.04	0.03	0.13	.889	– 0.06	0.06
CAQ	0.00	0.01	0.00	.998	– 0.01	0.01
DASS-D	– 0.02	0.03	– 1.1	.281	– 0.07	0.02
Hassles × Avoidance	– 0.19	0.29	– 0.65	.510	– 0.77	0.39

CAQ = Cognitive Avoidance Questionnaire Total Score, DASS-D = Depression Subscale of the Depression, Anxiety, and Stress Scale

as well as CAQ score entered as covariates. The model was found to significantly predict depressive symptoms, $r = .61$, $R^2 = .38$, $F(8, 272) = 25.8$, $p < .001$. As is indicated in Table 3, the impact of negative events and general cognitive avoidance were significant predictors of depressive symptom, but no interaction terms were statistically significant.

The analyses were repeated for daily hassles, with the model being significantly predictive of variance in depressive symptoms, $r = .62$, $R^2 = .39$, $F(8, 276) = 31.1$, $p < .001$. This was accounted for by daily hassles and general avoidance being significant predictors of depressive symptoms; however, once again, none of the interaction terms were significant.[1]

Discussion

Our results showed that negative life events, daily hassles, and avoidance of thinking about these experiences did not correlate with AM specificity. Contrary to our expectations, no evidence was found for an interaction effect between experiencing these events or hassles and avoidance of thinking about them. In light of these negative findings, we decided to conduct another study wherein we extended the temporal frame for life events and daily hassles to one year, to assess more stressors over a longer period of time. We believed that this might better test the cumulative process of stressors and avoidance through which OGM may develop. We also attempted to improve the measurement of our constructs of interest. We used an assessment of daily hassles that included additional items for interpersonal stressors, given that they have been found to have a contribution to distress independent from other hassles (Maybery, 2003), and in one study this category of daily hassles was found to correlate with AM specificity (Sumner et al., 2011). We also included a multi-item measure of the cognitive avoidance of thinking about particular negative circumstances that has been found to correlate with AM specificity (Brewin, Watson, McCarthy, Hyman, & Dayson, 1998; Kuyken & Brewin, 1995). An alternative measure of general cognitive avoidance was used that has in one instance been found to correlate with AM specificity (Hermans et al., 2005).

Study 2

Method

Participants and procedure

The same recruitment method and procedure was used as in Study 1, with a separate sample of 341 participants from MTurk, none of whom completed both surveys. After data cleaning and again removing participants who completed the survey twice or clearly gave erroneous responses to all items,

[1] Given that studies using the AMT have used various indices of AM specificity and OGM, we reanalyzed the data after coding the responses to the AMT for number of categoric, extended, and semantic memories, and found results that were consistent with those for specific AM. For the functional-avoidance hypothesis, models including negative life events did not predict variance in categoric, extended, or semantic AM (all Fs < 1.7, ps > .134), nor were any interaction terms statistically significant (all ps > .064). For daily hassles, none of the models predicted variance (all Fs < 1.2, ps > .340), nor were any interaction terms statistically significant (all ps > .545). For the affect-regulation function test, the models for negative life events were all significant (Fs = 26.8–28.9, all ps < .001), but, critically, none of the interaction terms were (all ps > .052). The models including daily hassles were all significant (Fs = 31.5–34.8, all ps < .001), but again, none of the interaction terms were (all ps > .060). The proportions and standard deviations for each of these types of AM in Study 1 were as follows: categoric AM, $M = 13.9\%$ ($SD = 12.5\%$); extended AM, $M = 26.1\%$ ($SD = 15\%$); and semantic AM, $M = 4.4\%$ ($SD = 7.7\%$).

Table 3 Study 1 results of moderation analyses testing the affect-regulation function of OGM with depressive symptoms as the dependent variable

	B	*SE*	*t*	*p*	L.C.I.	U.C.I.
Negative Life Events						
Constant	0.8	0.06	1.3	.197	– 0.04	.021
Impact of Negative Events	0.25	0.09	2.6	.010	0.06	0.44
Avoidance of Negative Events	0.06	0.07	0.82	.412	– 0.08	0.21
AM Specificity	– 0.02	0.02	– 0.75	.450	– 0.05	0.02
CAQ	0.01	0.00	7.1	<.001	0.01	0.01
Impact × Avoidance	– 0.00	0.08	– 0.03	.970	– 0.17	0.17
Impact × AM Specificity	0.01	0.05	0.13	.896	– 0.09	0.11
Avoidance × AM Specificity	0.00	0.04	0.06	.950	– 0.07	0.07
Impact × Avoidance × AM Specificity	0.02	0.06	0.38	.700	– 0.09	0.14
Daily Hassles						
Constant	0.17	0.07	2.3	.019	0.03	0.32
Daily Hassles	1.6	0.26	6.1	<.001	1.1	2.1
Avoidance of Hassles	– 0.03	0.07	– 0.53	.591	– 0.17	0.09
AM Specificity	– 0.01	0.01	– 0.96	.333	– 0.04	0.01
CAQ	0.01	0.00	4.8	<.001	0.00	0.01
Hassles × Avoidance	– 0.59	0.48	– 1.2	.220	– 1.5	0.36
Hassles × AM Specificity	– 0.01	0.12	– 0.07	.938	– 0.24	0.22
Avoidance × AM Specificity	– 0.00	0.04	– 0.02	.982	– 0.08	0.08
Hassles × Avoidance × AM Specificity	0.13	0.32	0.41	.683	– 0.50	0.76

CAQ = Cognitive Avoidance Questionnaire Total Score, DASS-D = Depression Subscale of the Depression, Anxiety, and Stress Scale

the sample consisted of 318 participants (68.2% female), with a mean age of 36.7 years (*SD* = 12.3). The majority were again Caucasian (78.9%), with small numbers identifying as Asian (6%), Latino or Hispanic (6.9%), African American (4.7%), or other ethnicities (3.2%). Half had a bachelor's degree (50%), and the remainder had diplomas or certificates (18.7%), post-graduate qualifications (15.8%), or had finished high school (15.5%). The majority were employed, either full-time (60.3%), part-time (19.6%), or casually (7.9%), and 24% reported currently studying.

Measures

The AMT was used again for the second study, with the same methodology as in Study 1 (interrater reliability, ICC = .82), as was the DASS Depression subscale. Again, we report the DASS Anxiety subscale for descriptive purposes, which had a mean score of 3.4 (*SD* = 4.1) and was internally reliable (Cronbach's alpha = .80). As noted, we also used different measures of life events, daily hassles, and cognitive avoidance.

Major life events An updated version of the Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967) was used to assess the occurrence of 43 different life events over the last 12 months that are commonly reported as being stressful (Scully, Tosi, & Banning, 2000). As with the Life Experiences Survey used in Study 1, participants were asked whether they had experienced any of the events and the impacts that they had, and the data were coded and summed to provide a scale on which higher scores indicated more, and more impactful, negative events over the last 12 months. The Cronbach's alpha for these items was .61. The SRRS also allows researchers to calculate a total score for adjustment-related stress by adding together predetermined stress scores for each event that is endorsed. These scores were based on average weightings as established in Scully et al.'s study in the U.S. population. We used these two scoring methods to provide the subjective and norm-based impacts of life events.

Daily hassles The Negative Event Scale (NES; Maybery, Neale, Arentz, & Jones-Ellis, 2007) was used to assess daily hassles. The NES comprises 46 items relating to daily hassles, with a majority of the items focusing on interpersonal stress (e.g., problems with friends, partners, or co-workers). Participants indicated how much of a hassle each of the stressors was for them, using a 5-point Likert scale ranging from 1 (*no hassle*) to 5 (*extreme hassle*), and the scores were totaled to produce an overall hassles score. The items were found to have high internal reliability (Cronbach's alpha = .95). As with the SRRS, participants were asked to respond to the items in relation to the last 12 months.

Cognitive avoidance Again, we assessed the avoidance of the specific events and hassles that were surveyed, as well as the

tendency for cognitive avoidance in general. For the events and hassles, we used the two-item Avoidance subscale from the short form of the Impact of Events Scale–Revised (IES; Thoresen et al., 2010). This short form correlates strongly with the full Avoidance subscale (*r*s = .78–.90; Thoresen et al., 2010) and is a less burdensome alternative. Participants completed the two items ("I try not to think about it," "I am aware that I still have a lot of feelings about it, but I don't deal with them") in relation to each of the events or hassles that they identified experiencing over the last 12 months. The original IES scale of 1 (*not at all*) to 5 (*often*) was used for the responses to daily hassles, given that all participants completed all the daily hassles items; however, a scale of 0 (*not at all*) to 4 (*often*) was used for events, so as not to artificially inflate the avoidance scores just because participants had endorsed experiencing a particular event. The items correlated strongly with each other for life events (r = .89) and for hassles (r = .95), and were averaged to produce an overall indicator of how much participants avoided thinking about either life events that had impacted negatively on them or daily hassles. The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) was used to assess the general disposition to suppress and avoid unwanted thoughts. The WBSI has 15 items, and participants indicate how much they agree with the items using a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The items were totaled in order to generate an overall score, with higher scores indicating a stronger tendency to suppress thoughts in general. The WBSI had good internal reliability in the present study (Cronbach's alpha = .95).

Results

Descriptive statistics and zero-order correlations between the study variables are reported in Table 4. Consistent with Study 1, AM specificity generally did not correlate significantly with any of the other variables, with the noted exception of a weak negative correlation with daily hassles, and depressive symptoms. The same data analyses were conducted using the different measures. Again, life events, hassles, IES scores for life events, and depressive symptoms were found to be highly positively skewed and were logarithmically transformed to attain a normal distribution.

Functional-avoidance hypothesis

The results for the regression equation to assess whether avoidance moderated the impact of negative life events on AM specificity showed that the model marginally failed to reached statistical significance, r = .19, R^2 = .04, $F(5, 303)$ = 2.2, p = .053, and none of the variables were significant predictors of AM specificity (see Table 5). We repeated this analysis using the weighted adjustment scores for the SRSS items and related avoidance. This model did significantly predict AM specificity, r = .19, R^2 = .04, $F(5, 298)$ = 2.3, p = .043; however, none of the predictors were significant (all ps > .10), including the interaction term (p = .404). Again, we repeated these analyses using the impact of events rated as positive and the avoidance of these events, and the model as a whole did not significantly predict variance in AM specificity or have any significant unique predictors (ps > .05).

The regression analysis for daily hassles showed that the model did significantly predict AM specificity, r = .23, R^2 = .05, $F(5, 305) = 2.6$, p = .023. Importantly, the interaction term was significant (see Table 5) and significantly increased the variance explained by the model, R^2 change = .03, $F(1, 303)$ = 6.8, p = .009. We used the John–Neyman procedure to probe the interaction effect in order to determine in which region

Table 4 Descriptive statistics and zero-order correlations between the Study 2 variables

	Specific AM	Impact of Negative Events	IES Negative Events Avoidance	Daily Hassles	IES Hassles Avoidance	SRSS Weights	SRSS Weights Avoidance	WBSI	DASS-D	Mean (*SD*)
Specific AM	–									.64 (.22)
Impact of Negative Events	.04	–								4.2 (4.7)
IES Negative Events Avoidance	.05	.79***	–							0.09 (0.13)
Daily Hassles	– .14*	.27***	.21***	–						1.74 (0.6)
IES Hassles Avoidance	– .07	.18**	.23***	.83***	–					1.57 (0.73)
SRSS Weights	.06	65***	.55***	.27*	18**	–				127.2 (84.7)
SRSS Weights Avoidance	– .03	.65***	.68***	.24***	.22***	.68***	–			0.17 (0.17)
WBSI	– .11	.31***	.27***	.32***	.28***	.30***	.33***	–		3.2 (0.9)
DASS-D	– .12*	.33***	.27***	.50***	.45***	.56***	.36***	.56***	–	4.8 (5.2)

IES = Impact of Events Scale, WBSI = White Bear Suppression Inventory, DASS-D = Depression Subscale of the Depression, Anxiety, and Stress Scale, SRRS Weights = Total of weighted scores of readjustment to life events, Social Readjustment Rating Scale. Specific AM is reported as the proportion of specific responses on the Autobiographical Memory Test. The impact of negative events and daily hassles, both corresponding avoidance measures, and DASS-D are logarithmically transformed. * p < .05, ** p < .01, *** p < .001.

Table 5 Study 2 results of moderation analyses testing the functional avoidance hypothesis with AM specificity as the dependent variable

	B	*SE*	*t*	*p*	L.C.I.	U.C.I.
Negative Life Events						
Constant	7.6	0.53	14.4	<.001	6.5	8.7
Impact of Negative Events	– 0.01	0.78	– 0.01	.991	– 1.5	1.5
IES Negative Events Avoidance	9.5	10.1	0.95	.345	– 10.3	29.4
WBSI	– 0.01	0.01	– 1.4	.209	– 0.04	0.01
DASS-D	– 0.63	0.34	– 1.8	.067	– 1.3	0.05
Impact × Avoidance	– 14.4	14.2	– 1.0	.309	– 42.4	13.5
Daily Hassles						
Constant	7.7	0.50	15.3	<.001	6.7	8.7
Daily Hassles	– 1.3	1.8	– 0.76	.443	– 4.8	2.1
IES Hassles Avoidance	0.50	0.31	1.6	.103	– 0.1	1.1
WBSI	– 0.01	0.01	– 1.5	.126	– 0.03	0.004
DASS-D	– 0.32	0.37	– 0.87	.380	– 1.1	0.40
Hassles × Avoidance	– 3.6	1.8	– 2.6	.009	– 6.4	– 0.89

IES = Impact of Events Scale, WBSI = White Bear Suppression Inventory, DASS-D = Depression Subscale of the Depression, Anxiety, and Stress Scale

avoidance significantly moderated the effect of daily hassles on AM specificity at the $p < .05$ level. Higher daily hassles began to significantly predict lower AM specificity at $z = 0.73$ standard deviations above the mean avoidance scores (unstandardized effect = – 3.08, standard error = 1.56, $t = – 1.97$, $p = .050$), with this interaction effect becoming stronger up to a maximum of $z = 2.86$ (unstandardized effect = – 8.85, standard error = 2.98, $t = – 2.96$, $p = .003$). The association between hassles and AM specificity was nonsignificant ($p < .05$) at values below $z = 0.73$ standard deviations above the mean avoidance score. Figure 1 shows a simple slope analysis using the mean and plus and minus one standard deviation from the mean, indicating that higher intensity of daily hassles was associated with lower AM specificity when avoidance of thinking about these hassles was high.

To explore whether this moderating effect was accounted for by interpersonal or noninterpersonal daily hassles, we calculated separate subscales for those items on the NES and related avoidance items. There was no difference in the results between categories, with both having significant interaction effects and daily hassles predicting lower AM specificity where there was higher avoidance of thinking about them.

As in Study 1, we also assessed whether general cognitive avoidance, as measured by the WBSI in this study, might be a moderator. The model containing negative life events significantly predicted AM specificity, $r = .19$, $R^2 = .03$, $F(4, 304) = 3.1$, $p = .016$, but no variables were observed to predict unique variance. The model containing daily hassles did not significantly predict AM specificity, $r = .16$, $R^2 = .03$, $F(4, 304) = 1.9$, $p = .103$, and none of the predictors in the model were significant. This indicated again that the general tendency to avoid negative cognitions did not moderate the association between events or hassles and AM specificity.

Affect-regulation function of OGM

The first model tested included impact of events as the focal predictor, avoidance of events and AM specificity as two moderators, and the two- and three-way interaction terms as well as the WBSI scores being entered as covariates. The model was found to significantly predict depressive symptoms, $r = .59$, $R^2 = .35$, $F(8, 300) = 32.1$, $p < .001$. The impact of negative events and general cognitive avoidance were unique predictors of depressive symptoms, but no interaction terms were significant (see Table 6). The analyses were repeated for daily hassles, with the model being significantly predictive of variance in depressive symptoms, $r = .66$, $R^2 = .44$, $F(8, 300) = 42.9$, $p < .001$. Only general cognitive avoidance was a significant predictor of depressive symptoms, and none of the interaction terms were significant.[2]

[2] As in Study 1, we reanalyzed the data after coding responses to the AMT for numbers of categoric, extended, and semantic memories, and found results that were consistent with those for specific AM. For the functional-avoidance hypothesis, models including negative life events did predict variance in categoric ($F = 2.9$, $p = .012$) and extended AM ($F = 2.4$, $p = .031$), but not in semantic AM ($F = 1.0$, $p = .402$). Critically, none of the interaction terms in the models were statistically significant (all $ps > .071$). For daily hassles, the models did not predict variance in categoric or extended AM (both $Fs < 1.72$, $ps > .161$), nor were the interaction terms in these models statistically significant (both $ps > .113$). For extended AM, the model was not statistically significant ($F = 1.7$, $p = .131$), but the interaction term was ($p = .026$). For the affect-regulation function test, the models for negative life events were all significant ($Fs = 32.5–34.9$, all $ps < .001$), but, critically, none of the interaction terms were (all $ps > .145$). The models including daily hassles were all significant ($Fs = 40.2–45.7$, all $ps < .001$), but again, none of the interaction terms were (all $ps > .111$).The proportions and standard deviations for each of these types of AM in Study 2 were as follows: categoric AM, $M = 12.3\%$ ($SD = 15.5\%$); extended AM, $M = 17.7\%$ ($SD = 14.2\%$); and semantic AM, $M = 2.8\%$ ($SD = 7.2\%$).

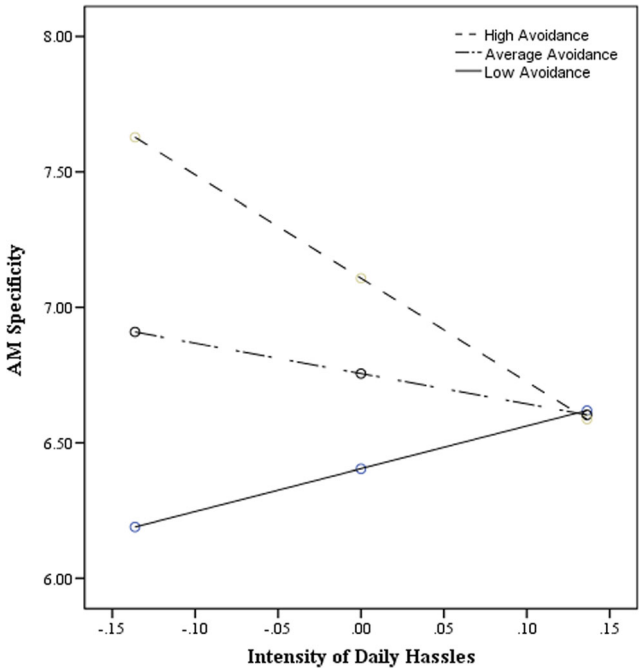

Fig. 1 Simple slope analyses of interaction effects between intensity of daily hassles and avoidance of thinking about hassles on autobiographical memory (AM) specificity. The data for intensity of daily hassles are shown following logarithmic transformation and mean centering.

General discussion

In the present study we aimed to test the functional-avoidance hypothesis of OGM development, which represents the first study to assess whether the interaction between experiencing life events or daily hassles and avoidance of thinking about them was associated with lower AM specificity. The findings were consistent across Studies 1 and 2 for major life events, in that major negative life events that had occurred in the last 6 or 12 months were not associated with AM specificity, nor were there any interactions with avoidance of thinking about these events. For daily hassles, Study 1 showed that hassles occurring in the previous month did not predict AM specificity, nor was there any interaction with avoidance of thinking about them. However, when we increased the temporal frame of these hassles to 12 months in Study 2, we found that more daily hassles did predict lower AM specificity, and that this relationship was stronger for those who endorsed being more highly avoidant of thinking about them.

These findings provide some preliminary evidence of how the avoidance of specific negative experiences might be associated with reduced AM specificity. These effects were not attributable to a general tendency to avoid or suppress thoughts, either, given that levels of general cognitive avoidance in our study were not correlated with AM specificity, nor were they a moderator of the effects. In our sample, general

Table 6 Study 2 results of moderation analyses testing the affect-regulation function of OGM with depressive symptoms as the dependent variable

	B	*SE*	*t*	*p*	L.C.I.	U.C.I.
Negative Life Events						
Constant	– 0.18	0.07	– 2.3	.023	– 0.33	– 0.02
Impact of Negative Events	0.28	0.13	2.1	.033	0.02	0.53
IES Negative Events Avoidance	– 0.93	1.6	– 0.58	.565	– 4.1	2.3
AM Specificity	– 0.02	0.02	– 1.0	.313	– 0.04	0.01
WBSI	0.02	0.00	10.7	<.001	0.01	0.2
Impact × Avoidance	0.96	2.0	0.47	.638	– 3.0	5.0
Impact × AM Specificity	– 0.00	0.06	– 0.04	.966	– 0.11	0.11
Avoidance × AM Specificity	0.20	0.68	0.30	.764	– 1.1	1.5
Impact × Avoidance × AM Specificity	– 0.17	0.83	– 0.21	.838	– 1.8	1.5
Daily Hassles						
Constant	– 3.3	2.4	– 1.4	.008	– 8.1	1.3
Daily Hassles	1.7	1.3	1.3	.182	– 0.81	4.3
IES Hassles Avoidance	0.70	1.1	0.65	.516	– 1.4	2.8
AM Specificity	0.06	0.35	0.17	.860	– 0.63	0.75
WBSI	0.01	0.002	8.5	<.001	0.01	0.02
Hassles × Avoidance	– .032	0.53	– 0.61	.545	– 1.4	0.73
Hassles × AM Specificity	– 0.03	0.19	– 0.17	.858	– 0.4	0.33
Avoidance × AM Specificity	– 0.01	0.17	– 0.07	.947	– 0.35	0.33
Hassles × Avoidance × AM Specificity	0.004	0.09	0.05	.962	– 0.16	0.17

IES = Impact of Events Scale, WBSI = White Bear Suppression Inventory, DASS-D = Depression Subscale of the Depression, Anxiety, and Stress Scale

and specific avoidance were correlated, but only the latter moderated the relationship between chronic daily stressors and AM specificity. This points to the specificity of avoidance of thinking about negative events in OGM development, relative to generally avoiding negative experiences (e.g., thoughts about oneself or feeling sad). We also found that both interpersonal and noninterpersonal chronic daily hassles accounted for this effect, adding to the previous literature focused on interpersonal stress (Sumner et al., 2011).

The finding that major life events did not predict AM specificity is consistent with previous studies (Gibbs & Rude, 2004; Hamlat et al., 2015), although these studies did not assess the interaction with avoidance. As a particularly aversive case of negatively impacting life event, trauma has been postulated as being central in the development of OGM (Williams, 1996). Meta-analytic research suggests that the experience of trauma may be associated with lower AM specificity (Barry et al., 2018), and other evidence indicates that this association is much larger in the context of a diagnosis of post-traumatic stress disorder, which includes a tendency for higher cognitive avoidance (Ono et al., 2016). Future research may formally test whether the experience of trauma and cognitive avoidance of this trauma interact to produce an overgeneral style of memory retrieval.

With respect to affect regulation, we found no evidence that higher cognitive avoidance of specific events or lower AM specificity reduced the impact of negative experiences on depressive symptoms. This contrasts with studies showing that a less-specific style of AM retrieval is related to less distress in the context of negative stimuli (Raes et al., 2003; Raes et al., 2006) or failure (Hermans et al., 2008), and that OGM moderates the association between daily hassles and depressive symptoms (Anderson et al., 2010). One explanation for this is that OGM buffers against the effects of negative events on depressed mood only in the short term, but is a risk factor for depression over time if it becomes more pervasive (Sumner et al., 2010). Indeed, previous studies have looked predominantly at much shorter timeframes, in which lower AM specificity was protective against distress (Hermans et al., 2008; Raes et al., 2003; Raes et al., 2006). A shortcoming of our study design is that it could not disentangle these different effects. Future longitudinal studies might examine and distinguish how the affect regulation produced by this cognitive avoidance of specific AM is initially adaptive but becomes maladaptive once it becomes generalized or pervasive. It should also be noted that AM specificity and depressive symptoms either were not correlated with depressive symptom (Study 1) or were weakly correlated (Study 2). Although a range of studies have shown that AM specificity correlates with depressive symptoms in clinical samples (Williams et al., 2007), this correlation seems to be absent or weak in studies of nonclinical samples that use either the full-instructions AMT (e.g., Debeer et al., 2009; Ganly, Salmon, & McDowall, 2017; Hauer, Wessel, & Merckelbach, 2006) or the "minimal-instructions" AMT used in this study (Debeer et al., 2009; Takano, Mori, Nishiguchi, Moriya, & Raes, 2017). Therefore, our findings are consistent with the notion that reduced AM specificity is characteristic of depressive disorders or in those remitted from a depressive disorder, but is not robustly correlated with depressive symptoms in community samples.

This study provides an initial investigation of these hypotheses, and the general limitations of online surveys are applicable here, such as possible satisficing behaviors (e.g., completing questions quickly or without much thought; Krosnick, 1991) and an inability to make causal inferences. Nonetheless, it does provide an impetus for future longitudinal studies that might provide clearer information on the reciprocal and complex relationships between affect regulation and the emergence of more pervasive OGM. Such study designs might use multiple time points to more effectively examine how negative experiences and related avoidance might cumulatively affect AM recall and lead to the development of an OGM style of retrieval. With respect to measurement, more rigorous assessments of chronic daily stressors and negative life events may be justified, perhaps with assessment conducted through interviews. This approach may be preferable to checklists, which participants might answer with a different timeframe in mind than specified. This is a possible limitation of our study, and one that would be overcome in an interview assessment, especially given that previous research using interview methods has shown a more robust correlation with AM specificity (Sumner et al., 2011). Furthermore, as it may be that our improved measurement in Study 1 was the cause of observing significant effects in daily hassles, and not necessarily the increased timeframe, future research may wish to reassess this shorter timeframe in order to examine whether effects are to be found. Future research may also consider using a second reporter to verify the occurrence of life events and hassles, as a means of improving sensitivity in the measurement, especially in contexts where reduced AM specificity might compromise recall.

Our finding that general cognitive avoidance was not related to AM specificity was consistent with some (Gibbs & Rude, 2004; Sumner et al., 2014), but not all (Hermans et al., 2005), previous findings. Future studies should seek to measure the specific avoidance of a range of events, rather than only general cognitive avoidance. This will provide more sensitivity to detect effects, if they are present. Moderators of the development of OGM would be of interest also, since there may be particular individual differences (e.g., age, personality traits) or characteristics of negative events (e.g., chronicity or repeated experiences) that evoke avoidance or contribute differently to the development of OGM. We did not assess for lifelong traumatic experiences in this study, instead focusing on negative life events and daily hassles that occur in

adulthood. This would be an important addition to future studies, though, so as to examine how these particular negative life events might predispose individuals to the development of OGM in the context of subsequent negative life experiences in adulthood and the cognitive avoidance of these experiences (Williams, 1996). It may be that trauma, including that occurring in childhood, or indeed negative childhood experiences in general, are a prerequisite for this development over time, or such factors may moderate any effects of negative experiences and avoidance (e.g., Schönfeld, Ehlers, Böllinghaus, & Rief, 2007) and predict more variance in AM specificity. We also note that because the "minimal-instructions" version of the AMT was used, the results must be interpreted within this context, and since participants were not asked to recall specific memories, it is possible that these findings will not generalize to this "explicit" recall task.

In conclusion, this study represents the first test of the functional-avoidance hypothesis of OGM development that has focused on the interaction effect of the occurrence and cognitive avoidance of negative experiences on AM specificity. It indicated that suppressing thoughts of, and risk factor for, poor mental health.

References

Anderson, R. J., Goddard, L., & Powell, J. H. (2010). Reduced specificity of autobiographical memory as a moderator of the relationship between daily hassles and depression. *Cognition and Emotion*, *24*, 702–709. https://doi.org/10.1080/02699930802598029

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment*, *10*, 176–181. https://doi.org/10.1037/1040-3590.10.2.176

Barry, T. J., Lenaert, B., Hermans, D., Raes, F., & Griffith, J. W. (2018). Meta-analysis of the association between autobiographical memory specificity and exposure to trauma. *Journal of Traumatic Stress*, *31*, 35–46. https://doi.org/10.1002/jts.22263

Berna, F., Potheegadoo, J., Aouadi, I., Ricarte, J. J., Allé, M. C., Coutelle, R.,… Danion, J.-M. (2016). A meta-analysis of autobiographical memory studies in schizophrenia spectrum disorder. *Schizophrenia Bulletin*, *42*, 56–66. https://doi.org/10.1093/schbul/sbv099

Brewin, C. R., Watson, M., McCarthy, S., Hyman, P., & Dayson, D. (1998). Intrusive memories and depression in cancer patients. *Behaviour Research and Therapy*, *36*, 1131–1142. https://doi.org/10.1016/S0005-7967(98)00084-9

Bryant, R. A., Sutherland, K., & Guthrie, R. M. (2007). Impaired specific autobiographical memory as a risk factor for posttraumatic stress after trauma. *Journal of Abnormal Psychology*, 116, 837–841. https://doi.org/10.1037/0021-843X.116.4.837

Bunnell, S. L., & Greenhoot, A. F. (2018). Do overgeneral memories make us feel better? An experimental examination. *Memory*, 26, 74–88. https://doi.org/10.1080/09658211.2017.1323105

Burnside, E., Startup, M., Byatt, M., Rollinson, L., & Hill, J. (2004). The role of overgeneral autobiographical memory in the development of adult depression following childhood trauma. *British Journal of Clinical Psychology*, *43*, 365–376. https://doi.org/10.1348/0144665042388991

Chandler, J., & Shapiro, D. (2016). Conducting clinical research using crowdsourced convenience samples. *Annual Review of Clinical Psychology*, *12*, 53–81. https://doi.org/10.1146/annurev-clinpsy-021815-093623

Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review*, *107*, 261–288. https://doi.org/10.1037/0033-295X.107.2.261

Dalgleish, T., & Werner-Seidler, A. (2014). Disruptions in autobiographical memory processing in depression and the emergence of memory therapeutics. *Trends in Cognitive Sciences*, *18*, 596–604. https://doi.org/10.1016/j.tics.2014.06.010

Debeer, E., Hermans, D., & Raes, F. (2009). Associations between components of rumination and autobiographical memory specificity as measured by a Minimal Instructions Autobiographical Memory Test. *Memory*, *17*, 892–903. https://doi.org/10.1080/09658210903376243

Debeer, E., Raes, F., Williams, J. M. G., & Hermans, D. (2011). Context-dependent activation of reduced autobiographical memory specificity as an avoidant coping style. *Emotion*, *11*, 1500–1506. https://doi.org/10.1037/a0024535

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*, 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Ganly, T. J., Salmon, K., & McDowall, J. (2017). Is remembering less specifically part of an avoidant coping style? Associations between memory specificity, avoidant coping, and stress. *Cognition and Emotion*, *31*, 1419–1430. https://doi.org/10.1080/02699931.2016.1227304

Gibbs, B. R., & Rude, S. S. (2004). Overgeneral autobiographical memory as depression vulnerability. *Cognitive Therapy and Research*, *28*, 511–526. https://doi.org/10.1023/B:COTR.0000045561.72997.7c

Griffith, J. W., Sumner, J. A., Debeer, E., Raes, F., Hermans, D., Mineka, S.,… Craske, M. G. (2009). An item response theory/confirmatory factor analysis of the Autobiographical Memory Test. *Memory*, *17*, 609–623. https://doi.org/10.1080/09658210902939348

Hamlat, E. J., Connolly, S. L., Hamilton, J. L., Stange, J. P., Abramson, L. Y., & Alloy, L. B. (2015). Rumination and overgeneral autobiographical memory in adolescents: An integration of cognitive vulnerabilities to depression. *Journal of Youth and Adolescence*, *44*, 806–818. https://doi.org/10.1007/s10964-014-0090-2

Haque, S., & Conway, M. A. (2001). Sampling the process of autobiographical memory construction. *European Journal of Cognitive Psychology*, *13*, 529–547. https://doi.org/10.1080/09541440125757

Hauer, B. J., Wessel, I., & Merckelbach, H. L. G. J. (2006). Intrusions, avoidance and overgeneral memory in a non-clinical sample. *Clinical Psychology & Psychotherapy*, 13, 264–268. https://doi.org/10.1002/cpp.495

Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling (White paper). Retrieved from www.afhayes.com/

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods*, *41*, 924–936. https://doi.org/10.3758/BRM.41.3.924

Hermans, D., de Decker, A., De Peuter, S., Raes, F., Eelen, P., & Williams, J. M. G. (2008). Autobiographical memory specificity and affect regulation: Coping with a negative life event. *Depression and Anxiety*, 25, 787–792. https://doi.org/10.1002/da.20326

Hermans, D., Defranc, A., Raes, F., Williams, J. M. G., & Eelen, P. (2005). Reduced autobiographical memory specificity as an

avoidant coping style. *British Journal of Clinical Psychology*, 44, 583–589. https://doi.org/10.1348/014466505X53461

Hermans, D., Van den Broeck, K., Belis, G., Raes, F., Pieters, G., & Eelen, P. (2004). Trauma and autobiographical memory specificity in depressed inpatients. *Behaviour Research and Therapy*, *42*, 775–789. https://doi.org/10.1016/S0005-7967(03)00197-9

Heron, J., Crane, C., Gunnell, D., Lewis, G., Evans, J., & Williams, J. M. G. (2012). 40,000 memories in young teenagers: Psychometric properties of the Autobiographical Memory Test in a UK cohort study. *Memory*, *20*, 300–320. https://doi.org/10.1080/09658211.2012.656846

Hitchcock, C., Nixon, R. D., & Weber, N. (2014). A review of overgeneral memory in child psychopathology. *British Journal of Clinical Psychology*, *53*, 170–193. https://doi.org/10.1111/bjc.12034

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, *11*, 213–218. https://doi.org/10.1016/0022-3999(67)90010-4

Johnson, P. O., & Fay, L. C. (1950). The Johnson–Neyman technique, its theory and application. *Psychometrika*, *15*, 349–367. https://doi.org/10.1007/BF02288864

Kanner, A. D., Coyne, J. C., Schaefer, C., & Lazarus, R. S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine*, 4, 1–39. https://doi.org/10.1007/BF00844845

Kohn, P. M., & Macdonald, J. E. (1992). The Survey of Recent Life Experiences: A decontaminated hassles scale for adults. *Journal of Behavioral Medicine*, *15*, 221–236. https://doi.org/10.1007/BF00848327

Krosnick, J. A., (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. *Applied Cognitive Psychology*, *5*, 213–236. https://doi.org/10.1002/acp.2350050305

Kuyken, W., & Brewin, C. R. (1995). Autobiographical memory functioning in depression and reports of early abuse. *Journal of Abnormal Psychology*, *104*, 585–591. https://doi.org/10.1037/0021-843X.104.4.585

Lovibond, P. F., & Lovibond, S. H. (1995). Manual for the Depression Anxiety Stress Scales (2nd ed.). Sydney, Australia: Psychology Foundation of Australia.

Maybery, D. (2003). Incorporating interpersonal events within hassle measurement. *Stress and Health*, *19*, 97–110. https://doi.org/10.1002/smi.961

Maybery, D. J., Neale, J., Arentz, A., & Jones-Ellis, J. (2007). The negative event scale: Measuring frequency and intensity of adult hassles. *Anxiety, Stress, and Coping*, *20*, 163–176. https://doi.org/10.1080/10615800701217654

Monroe, S. M. (1983). Major and minor life events as predictors of psychological distress: Further issues and findings. *Journal of Behavioural Medicine*, *6*, 189–205. https://doi.org/10.1007/BF00845380

Moore, S. A., & Zoellner, L. A. (2007). Overgeneral autobiographical memory and traumatic events: An evaluative review. *Psychological Bulletin*, *133*, 419–437. https://doi.org/10.1037/0033-2909.133.3.419

Ono, M., Devilly, G. J., & Shum, D. H. (2016). A meta-analytic review of overgeneral memory: The role of trauma history, mood, and the presence of posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*, 157–164. https://doi.org/10.1037/tra0000027

Paolacci, G., & Chandler, J. (2014). Inside the Turk understanding mechanical Turk as a participant pool. *Current Directions in Psychological Science*, *23*, 184–188. https://doi.org/10.1177/0963721414531598

Raes, F, Hermans, D, de Decker, A, Eelen, P.., & Williams, J. M. G. (2003). Autobiographical memory specificity and affect regulation: An experimental approach. *Emotion*, *3*, 201–206. https://doi.org/10.1037/1528-3542.3.2.201

Raes, F., Hermans, D., Williams, J. M. G., & Eelen, P. (2006). Reduced autobiographical memory specificity and affect regulation. *Cognition and Emotion*, *20*, 402–429. https://doi.org/10.1080/02699930500341003

Raes, F., Williams, J. M. G., & Hermans, D. (2009). Reducing cognitive vulnerability to depression: A preliminary investigation of MEmory Specificity Training (MEST) in inpatients with depressive symptomatology. *Journal of Behavior Therapy and Experimental Psychiatry*, *40*, 24–38. https://doi.org/10.1016/j.jbtep.2008.03.001

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology*, *46*, 932–946. https://doi.org/10.1037/0022-006X.46.5.932

Schönfeld, S., Ehlers, A., Böllinghaus, I., & Rief, W. (2007). Overgeneral memory and suppression of trauma memories in post-traumatic stress disorder. *Memory*, *15*, 339–352. https://doi.org/10.1080/09658210701256571

Scully, J. A., Tosi, H., & Banning, K. (2000). Life event checklists: Revisiting the social readjustment rating scale after 30 years. *Educational and Psychological Measurement*, *60*, 864–876. :https://doi.org/10.1177/00131640021970952

Sexton, K. A., & Dugas, M. J. (2008). The cognitive avoidance questionnaire: Validation of the English translation. *Journal of Anxiety Disorders*, *22*, 355–370. https://doi.org/10.1016/j.janxdis.2007.04.005

Sumner, J. A. (2012). The mechanisms underlying overgeneral autobiographical memory: An evaluative review of evidence for the CaR-FA-X model. *Clinical Psychology Review*, *32*, 34–48. https://doi.org/10.1016/j.cpr.2011.10.003

Sumner, J. A., Griffith, J. W., & Mineka, S. (2010). Overgeneral autobiographical memory as a predictor of the course of depression: A meta-analysis. *Behaviour Research and Therapy*, *48*, 614–625. https://doi.org/10.1016/j.brat.2010.03.013

Sumner, J. A., Griffith, J. W., Mineka, S., Rekart, K. N., Zinbarg, R. E., & Craske, M. G. (2011). Overgeneral autobiographical memory and chronic interpersonal stress as predictors of the course of depression in adolescents. *Cognition and Emotion*, *25*, 183–192. https://doi.org/10.1080/02699931003741566

Sumner, J. A., Mineka, S., Adam, E. K., Craske, M. G., Vrshek-Schallhorn, S., Wolitzky-Taylor, K., & Zinbarg, R. E. (2014). Testing the CaR-FA-X model: Investigating the mechanisms underlying reduced autobiographical memory specificity in individuals with and without a history of depression. *Journal of Abnormal Psychology*, *123*, 471–486. https://doi.org/10.1037/a0037271

Takano, K., Mori, M., Nishiguchi, Y., Moriya, J., & Raes, F. (2017). Psychometric properties of the written version of the autobiographical memory test in a Japanese community sample. *Psychiatry Research*, *248*, 56–63. https://doi.org/10.1016/j.psychres.2016.12.019

Thoresen, S., Tambs, K., Hussain, A., Heir, T., Johansen, V. A., & Bisson, J. I. (2010). Brief measure of posttraumatic stress reactions: Impact of event scale-6. *Social Psychiatry and Psychiatric Epidemiology, 45*(3), 405–412. https://doi.org/10.1007/s00127-009-0073-x

van Vreeswijk, M. F., & de Wilde, E. J. (2004). Autobiographical memory specificity, psychopathology, depressed mood and the use of the Autobiographical Memory Test: A meta-analysis. *Behaviour Research and Therapy*, *42*, 731–743. https://doi.org/10.1016/s0005-7967(03)00194-3

Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality*, *62*, 615–640. https://doi.org/10.1111/j.1467-6494.1994.tb00311.x

Williams, J. M., & Broadbent, K. (1986). Autobiographical memory in suicide attempters. *Journal of Abnormal Psychology*, *95*, 144–149. https://doi.org/10.1037/0021-843X.95.2.144

Williams, J. M. G. (1996). Depression and the specificity of autobiographical memory. In D. C. Rubin (Ed.), Remembering our past: Studies in autobiographical memory (pp. 244–267). New York, NY: Cambridge University Press.

Williams, J. M. G. (2006). Capture and rumination, functional a voidance, and executive control (CaRFAX): Three processes that underlie overgeneral memory. *Cognition and Emotion*, *20*, 548–568. https://doi.org/10.1080/02699930500450465

Williams, J. M. G., Barnhofer, T., Crane, C., Herman, D., Raes, F., Watkins, E., & Dalgleish, T. (2007). Autobiographical memory specificity and emotional disorder. *Psychological Bulletin*, *133*, 122–148. https://doi.org/10.1037/0033-2909.133.1.122