The Effects of Overgeneral Autobiographical Memory Retrieval on Reappraisal Ability

Emotion regulation is defined as the attempts individuals make to influence the emotions we have, when we have them, and how we express and experience them (Gross, 1998). The ability to successfully regulate emotions has been linked to positive psychological, social, and physical health outcomes. Conversely, failures to regulate emotion has been linked to negative mood and anxiety disorders (Troy, Shallcross, Brunner, Friedman, & Jones, 2018). Thus, an ability to use adaptive regulation strategies may be important because it can enhance everyday functioning, and may also inform clinical practice.

One widely studied regulation strategy is reappraisal. Reappraisal involves consciously reinterpreting the meaning of a stimulus, with the intention to modify its initial emotional eliciting response (Nelson, Fitzgerald, Klumpp, Shankman, & Phan, 2015). Reappraisal is generally an adaptive strategy, as experimental studies have shown that instructed reappraisal reliably decreases self-reported negative affect and activation in neural regions associated with emotion generation, such as the amygdala (McRae, Jacobs, Ray, & Gross, 2012). Similarly, correlational studies have shown that people who frequently use reappraisal in their everyday lives also tend to report greater psychological wellbeing (Gross & John, 2003).

Recent developments in emotion regulation research have proposed that the degree to which a regulation strategy is adaptive or not depends on its context of use (Aldao, 2013). For example, studies have shown that using reappraisal is adaptive under situations where stressors cannot be controlled, such as being stuck in a traffic jam. However, under situations where stressors are controllable, such as if one discovers that they are being cheated on, using reappraisal is associated with maladaptive outcomes (Aldao, 2013). In our study, we propose that

one additional factor which may influence the effectiveness of reappraisal is the type of memory that is being reappraised.

Memory Type and Reappraisal

Autobiographical memory refers to the recollection of events from one's past. These memories can vary in their level of specificity (Ridout, Dritschel, Matthews, & Ocarroll, 2016). Specific autobiographical memories are memories for an event that happened at a particular time and place and lasted for a day or less (e.g., I played football with my colleagues last Saturday afternoon). Conversely, overgeneral autobiographical memories are categorical memories, referring to a group of events that share common elements (e.g., I always play football) or extended memories, referring to events that last longer than one day (e.g., I spent a week in Hawaii; Anderson, Dewhurst, & Dean, 2017). Research has showed that the tendency to recall overgeneral memories has been associated with maladaptive outcomes. For example, overgeneral memory bias has been identified as a stable cognitive marker across a wide range of mental disorders, such as depression or posttraumatic stress disorder (PTSD; Williams et al., 2007). Experimental studies have also shown that retrieving overgeneral memories may lead to negative outcomes such as increased ruminative thinking (Raes, Hermans, Williams, Geypen, & Eelen, 2006) or impaired problem solving (Williams et al., 2006).

We propose that overgeneral memories might also impair reappraisal ability. Why might this be? One possible explanation may be provided by theories on schemas (Dalgleish, 2004). Schemas have been conceptualized as a way of mentally representing knowledge, and their function is to organize knowledge at different levels of abstraction through coding the commonalities of a large number of different experiences in one's life. There are individual differences in the nature and content of schemas, which are in part determined as a function of

one's past experiences, such that stronger and more rigid schemas are determined by a greater number of repeated experiences of that event (Beck & Haigh, 2014; Dalgleish, 2004; Dane, 2010).

According to the theory, as overgeneral memories are composed of a recollection of repeated events in one's life, they should correspond to a stronger schema for those events. Stronger schemas are more stable and resistant to change, where they maintain their stability through two ways (Dalgleish, 2004). Firstly, stronger schemas may bias information processing to a greater degree, where information processing is biased in favor of maintaining the schema contents. In relation to reappraisal, this increased bias may make it more difficult for one to generate alternative interpretations (schema inconsistent information) to challenge the schema. Secondly, schematic change is also hypothesized to occur through a gradual process of schemas incorporating schema inconsistent information, a process termed accommodation (Dalgleish, 2004). To the extent that stronger schemas are more stable, this may mean that greater amounts of accommodation are required before schematic change occurs.

Despite theoretical considerations that reappraisal may be affected by memory generality, there has been a lack of research that has directly tested this hypothesis. Suggestive evidence that overgeneral memories may impair reappraisal comes from correlational studies showing that people who tend to recall their memories in an overgeneral manner also tend to use reappraisal less in their daily lives (Denkova, Dolcos, & Dolcos, 2012). Similarly, other studies have showed that people who are less willing to remain in contact with negatively evaluated private events, such as thoughts and memories (a characteristic of overgenerality bias), are also less likely to use reappraisal in their everyday life (Kashdan, Barrios, Forsyth, & Steger, 2006).

Conversely, other evidence suggests that increased memory specificity may enhance reappraisal. For example, PTSD patients who received reappraisal training in addition to exposure therapy - which involves recalling the details of a traumatic event - reported greater reductions in PTSD symptoms compared to patients who only received exposure therapy (Arntz, Tiesma, & Kindt, 2007). Additionally, experimental studies on episodic future thinking (which is hypothesized to rely on similar mechanisms as autobiographical recall) showed that participants who were trained to imagine future worrisome events in more detail had a greater ability to reappraise these events compared a control group (Jing, Madore, & Schacter, 2016)

The Present Study

The primary aim of the present study is to investigate if a person's ability to reappraise their negative autobiographical memories would be affected by whether a person is reappraising specific memories, or general memories. In our study, participants were randomly assigned to recall negative autobiographical memories in either a specific or general manner, followed by instructions to reappraise these memories. Reappraisal ability was operationalized as the degree to which reappraisal is able to decrease negative mood that is induced by memory recall, such that greater decreases in negative mood is indicative of greater reappraisal ability (Gross, 1998). We hypothesized that participants who are instructed to reappraise general negative memories will be less successful in using reappraisal compared to participants who are instructed to reappraise specific negative memories.

Method

Design

The experiment is a 2 x 2 mixed design, with the between subjects factor of memory type (specific vs. general memory recall), and the within subject factor of time (pre-reappraisal vs.

post-reappraisal). This study was approved by the Ethics Review Committee at the University of Toronto Mississauga.

Participants

An a priori power analysis was conducted for sample size estimation using the software G*Power version 3.1. Because of a lack of research examining the effect of memory type on reappraisal, we conservatively used the small to moderate effect size of d = 0.3. The projected sample size required to maintain a power of 0.90 within a 95% confidence interval is N=120 in this mixed model design.

To allow for expected attrition, we recruited 144 participants who were living in the United States using MTurk, a crowdsourcing website. Participants were offered 3$ in exchange for completing a short online survey. Participants were prescreened via a brief survey administered on Qualtrics to confirm that they were older than 18, were fluent in reading and speaking English, and had not been formally with a mental illness in the past year. 16 participants were initially excluded because they provided blank or no responses on the written manipulation check. Of the remaining 128 participants, an additional 16 participants were excluded because they failed to follow the instructions (e.g., they recalled a combination of general and specific memories on the written manipulation check, or they recalled the wrong type of memory for their condition).

The final sample consisted of 112 participants (68 males, 44 females), with an average age of 34 years old (range: 19-63). The sample was ethnically diverse: 11% were Asian, 11% were Black or African American, 75% were White, and 3% self-identified as multiethnic or “other”.

Materials.

Positive and Negative Affect. The 20-item Positive and Negative Affect Schedule was used to measure state mood (Watson, Clark, & Tellegen, 1988). Ten items measured positive affect and ten items measured negative affect. Participants reported how much they felt each of the 20 mood adjectives in the current moment on 5-point scales (1 = very slightly or not at all to 5 = extremely). Previous research has demonstrated that this measure is high in reliability and validity (Watson et al., 1988).

Mood Board. A novel mood board was included as a secondary measure of state affect. The mood board is a visual representation of positive and negative emotions on a spectrum, ranging from intense emotions to mild emotions. This mood board provides a maximum of 32 emotions that a participant can select, and can yield four scores: degree of intense negative emotions, degree of intense positive emotions, degree of mild emotions, and degree of mild positive emotions. This measure was administered and scored in a similar manner as the positive and negative affect schedule.

Memory Qualities. Participants were asked to rate how negative and how emotionally intense they felt about their memory, and how significant the memory is for them, responding on a five point Likert scale (1 = not at all, 5 = extremely), Similar measures have been used in other studies (e.g., Cohen & Mor, 2017; Denson, Creswell, Terides, & Blundell, 2014).

Procedure

Baseline. Participants consented to take part in a short online survey on memory and emotions using their personal computers. After obtaining consent, participants completed baseline measures of mood.

Memory Recall. Participants were then randomly assigned to recall a general or specific memory. In the general memory condition, participants (N=57) received the following instructions: “I want you to try to remember a category of similar events from your own life which has made you feel repeatedly upset. The upsetting events should be a group of events that share common elements, and the events should have occurred over a long period of time. The events may have occurred at any time in your life, they may be important or trivial, but they should be real events.”

In the specific memory condition, participants (N=55) received the following instructions: “I want you to try to remember a single event from your own life which has made you feel upset. The upsetting event should have occurred at a particular time and place, and the event should have lasted less than a day. The event you recall may have occurred at any time in your life, it may be important or trivial, but it should be a real event.”

Participants engaged in the recall task for 1 minute (on a timed page which allowed participants to advance after 1 minute), where they were asked to try to recall as many details as they can about these memories for the time period.

Next, participants were asked to write about the negative memories that they have recalled for 1 minute and 30 seconds, where they were asked to continuously elaborate on their response for the time period, such as to describe what happened, the timeframe of when the events occurred, and why the events are negative; Selcuk, Zayas, Günaydin, Hazan, & Kross, 2012). After finishing the description task, participants completed a measure of memory qualities and a secondary set of mood measures.

Memory Reappraisal. Participants were then asked to think of their negative memories in a different, less negative way (Cohen & Mors, 2017). For example, a person may have a

negative memory of being yelled at by his boss, but the person can reinterpret this memory less negatively by thinking that being yelled at helped him realize that he should place more importance on work. Participants engaged in the reappraisal task for 1 minute, where they were asked to try to think of as many possible ways in which their memories are less negative for the time period (Weber, Assunção, Martin, Westmever, & Geisler, 2013).

Next, participants were asked to write all of the ways in which they have reappraised their negative memories for 1 minute and 30 seconds, where they were asked to continuously elaborate on their answers for the time period, such as to explain how each perspective made their memories feel less negative. Participants then completed a final set of mood measures and memory qualities measures. Upon completion, participants answered an open ended question about what they thought the study was investigating, and then were debriefed. None of the participants were able to guess the purpose of the study.

Results

Preliminary Analysis

Baseline Characteristics. To examine whether our randomization procedure had worked as intended, we used *t* test and chi squared tests to test group differences on demographic variables and baseline measures of mood. The groups did not differ significantly in gender, ethnicity, or age, or baseline affect.

Manipulation Check. To check attention to and understanding of instructions, two independent raters who were blind to the experimental hypothesis coded the written descriptions of memories according to the criteria laid down by Williams (1992). Specific memories were defined as events that happened in a particular time and place or lasted for a day or less. Overgeneral memories were defined as memories which include extended memories (events that

lasted for longer periods of time), and categoric memories (events that occurred repeatedly over a period of time). If the participants failed to recall a memory, or talk about things which were not memories, their responses will be classed as 'omissions'. Good interrater agreement (k = 0.89) was found for the categorization of specific versus overgeneral responses. Of the 128 responses, 11 responses could not be classified as overgeneral or specific and were excluded from analysis. Of the remaining 117 responses, an additional 5 were excluded because the participants recalled the wrong type of memory according to their condition (e.g., they recalled a specific memory in the general condition).

Primary Analysis.

We analyzed the data with a series of linear mixed models, implemented using R statistical computing's lme4 package (Bates, Maechler, Bolker, & Walker, 2014). Reported beta coefficients are unstandardized, indicating raw effect sizes (on scales of -100 to 100 for self-report change scores).

Effect of Memory Type on Recall.

To examine the differential effects of general versus specific memory recall on mood, the models tested the fixed effects of memory type (general vs. specific) and time (baseline, post-recall) on the dependent variables of positive affect, positive mood board, negative affect, and negative mood board.

For values of negative affect, we found a main effect of time, $F(1,110) = 99.06$, $p < .0001$, but no time by memory type interaction, $F(1,110) = 1.56$, $p = .21$. Similarly, for values of negative mood board, we found a main effect of time, $F(1,110) = 126.79$, $p < 0.0001$, but no time by memory type interaction, $F(1,110) = 1.28$, $p = 0.26$. These findings indicate that participants reported feeling more negative affect following memory recall (negative affect b = 6.72; negative

mood board b = 2.74), but the increases in negative affect were not significantly different across groups.

For values of positive affect, we found a main effect of time, $F(1,110) = 67.09$, $p < .0001$, indicating that participants reported feeling less positive affect following memory recall, b = -3.47, but no time by memory type interaction, $F(1,110) = 1.54$, $p = .22$, indicating that decreases in positive affect were not significantly different across groups.

For values of positive mood board, we found an interaction of time and memory type, $F(1,110) = 8.28$, $p < .05$, such that lower positive mood following memory recall was reported in the general memory condition, b = -5.00, relative to the specific memory condition, b = -3.53.

Effect of Memory Type on Reappraisal Ability: Mood Measures

To examine the differential effects of general versus specific memory recall on reappraisal ability, the models tested the fixed effects of memory type (general vs. specific) and time (post-recall, post-reappraisal) on the dependent variables of positive affect, positive mood board, negative affect, negative mood board, and memory qualities.

For values of negative affect, we found a main effect of time, $F(1, 110) = 88.85$, $p < .0001$, but no time by memory type interaction, $F(1,110) = 0.81$, $p = 0.37$. Similarly, for values of negative mood board, we found a main effect of time, $F(1, 110) = 71.01$, $p < 0.001$, but no time by memory time interaction, $F(1,110) = 1.16$, $p = 0.28$. These results indicate that participants reported feeling less negative affect following reappraisal (negative affect b = -4.65 ; negative mood board b = -2.07). However, contrary to our central hypothesis, decreases in negative affect did not significantly differ depending on whether participants were reappraising general negative memories or specific memories.

For values of positive affect, we found a main effect of time, $F(1, 110) = 42.59$, $p < .0001$, indicating that participants reported feeling more positive affect following reappraisal, b = 4.00, but no time by memory type interaction, $F(1,110) = 1.84$, $p = 0.18$, indicating that increases in positive affect were not significantly different across groups.

For values of positive mood board, we found a main effect of memory type, $F(1, 110) = 5.67$, $p < .05$, indicating that participants who recalled general memories reported less positive affect compared to participants who recalled specific memories. We also found a main effect of time, $F(1,110) = 71.33$, $p < .0001$, indicating that participants reported feeling more positive affect following reappraisal, b = 1.84, but no memory by time interaction, $F(1,110) = 0.98$, $p=0.32$, indicating that increases in positive affect were not significantly different across groups. These results suggest that participants in both groups showed an equal ability to increase their positive affect via reappraisal. However, the groups differed in the extent of their recovery, such that after reappraisal, participants in the general memory group reported lower positive mood relative to the specific memory group.

Effect of Memory Type on Reappraisal: Memory Characteristics

For values of memory negativity, we found a main effect of time, $F(1,110) = 114.79$, $p < .0001$, indicating that participants reported feeling less negative about their memories following reappraisal, b = -0.35, but no time by memory type interaction, $F(1,110) = 1.12$, $p = .29$, indicating that decreases in memory negativity were not significantly different across groups.

For values of memory intensity, we found a main effect of time, $F(1,110) = 32.92$, $p < .0001$, indicating that participants reported that their memories were less emotionally intense following reappraisal, b = -0.98, but no time by memory type interaction, $F(1,110) = 0.27$, $p =$

0.60, indicating that decreases in memory intensity were not significantly different across groups.

For values of memory significance, we found a main effect of memory type, $F(1, 110) = 18.06$, $p < .0001$, indicating that participants who recalled general memories reported that their memories were more significant to them compared to participants who recalled specific memories. There was also a main effect of time, $F(1,110) = 15.49$, $p = .0001$, indicating that participants felt that their negative memories felt less significant to following reappraisal, b = -0.3, but no memory by time interaction, $F(1,110) = 0.37$, $p = 0.54$, indicating that the decreases in memory significance did not differ significantly across groups.

Discussion

The present study hypothesized that participants who are instructed to reappraise general negative memories will be less successful in using reappraisal compared to participants who are instructed to reappraise specific negative memories. The findings did not support our hypothesis, as participants who reappraised general negative memories showed an equal ability to down-regulate negative affect compared to participants who reappraised specific memories. Furthermore, participants who recalled general memories showed an equal ability as participants who recalled specific memories in using reappraisal as a functional regulation strategy across a variety of dependent measures, such as memory negativity or positive affect. Thus, the overall pattern of results from our study suggests that participants who recalled general memories are able to regulate their emotions in similar ways as participants who recalled specific memories.

We offer several explanations for these findings. Firstly, it is possible that overgeneral memory recall may not hinder explicit attempts to use reappraisal (i.e., using reappraisal when they receive the cue to). Rather, it is possible that overgeneral memory recall may hinder other

aspects of reappraisal, such as the spontaneous use of reappraisal. Indeed, several studies have shown that a tendency to recall overgeneral memories is associated with less frequent use of reappraisal (Denkova et al., 2012). Furthermore, experimental studies have shown that recalling overgeneral memories increases the spontaneous use of maladaptive emotion regulation strategies, such as rumination (i.e., behaviours and thoughts that focus one's attention on one's depressive symptoms and on the implications of these symptoms; Raes et al., 2006). Future studies should examine whether overgeneral memory recall has an effect on the spontaneous use of reappraisal.

Secondly, it is possible that overgeneral memory recall may not hinder the usage of reappraisal in healthy samples, but may hinder reappraisal in clinical samples, such as depressed patients. Indeed, theoretical accounts have proposed that recalling overgeneral memories may be more likely to activate abstract negative self representations in depressed individuals, who possess a highly elaborated repertoire of negative self representations (Williams et al., 2007). Activation of these conceptual structures may contribute to the onset of ruminative thinking (Beck & Bredemeir, 2016), where ruminative thinking may impair cognitive processing, such as reducing cognitive flexibility (Brinker, Campisi, Gibbs, & Izzard, 2013), which may in turn impair reappraisal ability (Garland, Gaylord, & Fredrickson, 2011). Future studies should examine whether overgeneral memory recall affects the usage of reappraisal in depressed patients.

Our study also found that participants who recalled general negative memories reported less positive affect on the mood board compared to participants who recalled specific memories. This finding is consistent with theories suggesting that processing negative information in an abstract, overgeneral manner is associated with negative emotional outcomes (Watkins, 2008).

These theories propose that people can adopt different levels of construal when processing information, such as an abstract construal, which are general, superordinate and decontextualized mental representations that convey the essential gist and meaning of events (e.g., overgeneral memories), or concrete construals, which include concrete, contextual, specific and incidental details of events (e.g. specific memories; Watkins, 2008). According to these theories, processing negative events at an abstract construal level may be detrimental because it could facilitate negative overgeneralizations, where negative events may be generalized to a sense of global personal inadequacy (Watkins, 2008).

The present study found that participants who recalled general memories had an equal ability to upregulate their positive emotions using reappraisal compared to participants who recalled specific memories. However, despite the fact that reappraisal produced similar increases in positive affect, participants who recalled general memories report feeling less positive affect following memory recall and thus continued to experience lower positive affect post-strategy implementation (Aldao & Mennin, 2012). These findings suggest that because participants who recall general memories report less positive affect following recall, greater amounts of regulation attempts or increased efforts at regulation may be required before these participants are able to return to baseline levels of positive affect.

References

Aldao, A., & Mennin, D. S. (2012). Paradoxical cardiovascular effects of implementing adaptive emotion regulation strategies in generalized anxiety disorder. *Behaviour Research and Therapy*,*50*(2), 122-130. doi:10.1016/j.brat.2011.12.004

Aldao, A. (2013). The Future of Emotion Regulation Research: Capturing Context. *Perspectives on Psychological Science, 8*(2), 155-172. doi:10.1037/e530982014-001

Anderson, R. J., Dewhurst, S. A., & Dean, G. M. (2017). Direct and generative retrieval of autobiographical memories: The roles of visual imagery and executive processes. *Consciousness and Cognition*,*49*, 163-171. doi:10.1016/j.concog.2017.02.010

Arntz, A., Tiesema, M., & Kindt, M. (2007). Treatment of PTSD: A comparison of imaginal exposure with and without imagery rescripting. *Journal of Behavior Therapy and Experimental Psychiatry*,*38*(4), 345-370. doi:10.1016/j.jbtep.2007.10.00

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2014). lme4: Linear mixed- effects models using Eigen and S4 (Version 1.0-6)[R package] Available from http://CRAN. Rproject. org/package= lme4.

Beck, A. T., & Haigh, E. A. (2014). Advances in Cognitive Theory and Therapy: The Generic Cognitive Model. *Annual Review of Clinical Psychology*,*10*(1), 1-24. doi:10.1146/annurev-clinpsy-032813-153734

Beck, A. T., & Bredemeier, K. (2016). A Unified Model of Depression. *Clinical Psychological Science*,*4*(4), 596-619. doi:10.1177/2167702616628523

Belcher, J., & Kangas, M. (2013). Autobiographical memory specificity in response to emotion pictorial cues among non-clinical participants. *Australian Journal of Psychology,65*(4), 250-257. doi:10.1111/ajpy.12027

Brinker, J. K., Campisi, M., Gibbs, L., & Izzard, R. (2013). Rumination, Mood and Cognitive Performance. *Psychology,04*(03), 224-231. doi:10.4236/psych.2013.43a034

Cohen, N., & Mor, N. (2017). Enhancing Reappraisal by Linking Cognitive Control and Emotion. *Clinical Psychological Science,6*(1), 155-163. doi:10.1177/2167702617731379

Dalgleish, T. (2004). Cognitive Approaches to Posttraumatic Stress Disorder: The Evolution of Multirepresentational Theorizing. *Psychological Bulletin,130*(2), 228-260. doi:10.1037/0033-2909.130.2.228

Dalgleish, T., Williams, J. M., Golden, A. J., Perkins, N., Barrett, L. F., Barnard, P. J., . . . Watkins, E. (2007). Reduced specificity of autobiographical memory and depression: The role of executive control. *Journal of Experimental Psychology: General,136*(1), 23-42. doi:10.1037/0096-3445.136.1.23

Dane, E. (2010). Reconsidering The Trade-Off Between Expertise And Flexibility: A Cognitive Entrenchment Perspective. *Academy of Management Review,35*(4), 579-603. doi:10.5465/amr.2010.53502832

Denkova, E., Dolcos, S., & Dolcos, F. (2012). Reliving emotional personal memories: Affective biases linked to personality and sex-related differences. *Emotion,12*(3), 515-528. doi:10.1037/a0026809

Denson, T. F., Creswell, J. D., Terides, M. D., & Blundell, K. (2014). Cognitive reappraisal increases neuroendocrine reactivity to acute social stress and physical pain. *Psychoneuroendocrinology, 49*, 69-78. doi:10.1016/j.psyneuen.2014.07.003

Garland, E. L., Gaylord, S. A., & Fredrickson, B. L. (2011). Positive Reappraisal Mediates the Stress-Reductive Effects of Mindfulness: An Upward Spiral Process. *Mindfulness, 2*(1), 59-67. doi:10.1007/s12671-011-0043-8

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology,74*(1), 224-237. doi:10.1037//0022-3514.74.1.224

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348-362. doi:10.1037/0022-3514.85.2.348

Jing, H. G., Madore, K. P., & Schacter, D. L. (2016). Worrying about the future: An episodic specificity induction impacts problem solving, reappraisal, and well-being. *Journal of Experimental Psychology: General,145*(4), 402-418. doi:10.1037/xge0000142

Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy,44*(9), 1301-1320. doi:10.1016/j.brat.2005.10.003

McRae, K., Jacobs, S. E., Ray, R. D., John, O. P., & Gross, J. J. (2012). Individual differences in reappraisal ability: Links to reappraisal frequency, well-being, and cognitive control. *Journal of Research in Personality,46*(1), 2-7. doi:10.1016/j.jrp.2011.10.003

Nelson, B. D., Fitzgerald, D. A., Klumpp, H., Shankman, S. A., & Phan, K. L. (2015). Prefrontal engagement by cognitive reappraisal of negative faces. *Behavioural Brain Research, 279,* 218-225. doi:10.1016/j.bbr.2014.11.034

Raes, F., Hermans, D., Williams, M. G., Geypen, L., & Eelen, P. (2006). The Effect of Overgeneral Autobiographical Memory Retrieval on Rumination. *Psychologica Belgica,46*(1-2), 131. doi:10.5334/pb-46-1-2-131

Ridout, N., Dritschel, B., Matthews, K., & Ocarroll, R. (2016). Autobiographical memory specificity in response to verbal and pictorial cues in clinical depression. *Journal of Behavior Therapy and Experimental Psychiatry,51*, 109-115. doi:10.1016/j.jbtep.2016.01.002

Selcuk, E., Zayas, V., Günaydin, G., Hazan, C., & Kross, E. (2012). Mental representations of attachment figures facilitate recovery following upsetting autobiographical memory recall. *Journal of Personality and Social Psychology,103*(2), 362-378. doi:10.1037/a0028125

Troy, A. S., Shallcross, A. J., Brunner, A., Friedman, R., & Jones, M. C. (2018). Cognitive reappraisal and acceptance: Effects on emotion, physiology, and perceived cognitive costs. *Emotion, 18*(1), 58-74. doi:10.1037/emo0000371

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin,134*(2), 163-206. doi:10.1037/0033-2909.134.2.163

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070. doi:10.1037//0022-3514.54.6.1063

Weber, H., Assunção, V. L., Martin, C., Westmeyer, H., & Geisler, F. C. (2013). Reappraisal inventiveness: The ability to create different reappraisals of critical situations. *Cognition and Emotion, 28*(2), 345-360. doi:10.1080/02699931.2013.83215

Williams, J. M. G., & Dritschel, B. H. (1992). Categoric and extended autobiographical memories. In M. Conway, D. Rubin, H. Spinnler, & W. A. Wagenaar (Eds.), *Theoretical*

perspectives on autobiographical memory (pp. 391–412). Dordrecht, the Netherlands: Kluwer Academic Publishers.

Williams, J. M., Eade, J., Healy, H., Chan, S., Crane, C., & Barnhofer, T. (2006). Retrieval of autobiographical memories: The mechanisms and consequences of truncated search. *Cognition and Emotion,20*(3-4), 351-382. doi:10.1080/0269993050034252

Williams, J. M., Ellis, N. C., Tyers, C., Healy, H., Rose, G., & Macleod, A. K. (1996). The specificity of autobiographical memory and imageability of the future. *Memory & Cognition,24*(1), 116-125. doi:10.3758/bf03197278

Williams, J. M., Barnhofer, T., Crane, C., Herman, D., Raes, F., Watkins, E., & Dalgleish, T. (2007). Autobiographical memory specificity and emotional disorder. *Psychological Bulletin,133*(1), 122-148. doi:10.1037/0033-2909.133.1.122