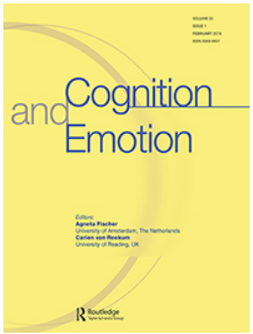

Routledge
Taylor & Francis Group

Cognition and Emotion

ISSN: 0269-9931 (Print) 1464-0600 (Online) Journal homepage: https://www.tandfonline.com/loi/pcem20

Forget about the future: effects of thought suppression on memory for imaginary emotional episodes

Nathan A. Ryckman, Donna Rose Addis, Andrew J. Latham & Anthony J. Lambert

To cite this article: Nathan A. Ryckman, Donna Rose Addis, Andrew J. Latham & Anthony J. Lambert (2018) Forget about the future: effects of thought suppression on memory for imaginary emotional episodes, Cognition and Emotion, 32:1, 200-206, DOI: 10.1080/02699931.2016.1276049

To link to this article: https://doi.org/10.1080/02699931.2016.1276049

COGNITION AND EMOTION, 2018
VOL. 32, NO. 1, 200–206
https://doi.org/10.1080/02699931.2016.1276049

Routledge
Taylor & Francis Group

BRIEF ARTICLE

Forget about the future: effects of thought suppression on memory for imaginary emotional episodes

Nathan A. Ryckman[a], Donna Rose Addis [a], Andrew J. Latham[b] and Anthony J. Lambert[a]

[a]Research Centre for Cognitive Neuroscience, School of Psychology, University of Auckland, Auckland, New Zealand; [b]Department of Philosophy and Brain and Mind Centre, University of Sydney, Sydney, Australia

ABSTRACT

Whether intentional suppression of an unpleasant or unwanted memory reduces the ability to recall that memory subsequently is a contested issue in contemporary memory research. Building on findings that similar processes are recruited when individuals remember the past and imagine the future, we measured the effects of thought suppression on memory for imagined future scenarios. Thought suppression reduced the ability to recall emotionally negative scenarios, but not those that were emotionally positive. This finding suggests that intentionally avoiding thoughts about emotionally negative episodes may inhibit representations of those memories, progressively reducing their availability to recall.

ARTICLE HISTORY
Received 27 September 2016
Revised 23 November 2016
Accepted 19 December 2016

KEYWORDS
Memory; forgetting; think/no-think; emotion; imagined future events

The question of whether intentionally suppressing or avoiding thoughts about an unpleasant experience subsequently reduces the ability to recall that experience is a contested issue in contemporary memory research (Erdelyi, 2006) and is intimately connected with the idea of repression. Some researchers view repression as "an empirical fact that is at once obvious and problematic" (Erdelyi, 2006, p. 499), while others have asserted that "the repression (or suppression) of trauma appears to be a clinical myth in search of scientific support" (Kihlstrom, 2002, p. 502). Prospects for resolving the controversy have seemed bleak, because although a research design capable of answering the question decisively is conceptually straightforward, experimental work seems to be ruled out, for obvious moral and ethical reasons. That is, performing an experiment where individuals are exposed to traumatising events followed by memory measurements, whilst scientifically decisive, would be morally repugnant. In this paper, we report a single study of novel design that attempts to make progress on this important and long-standing issue.

Our experimental design and rationale falls out of two key ideas. Firstly, a substantial body of behavioural and neuroimaging work has converged on the conclusion that generating a memory which represents an event from the past, and imagining an event that might happen in the future, involve a similar set of psychological and neural processes (Schacter & Addis, 2007; Schacter, Addis, & Buckner, 2007). For instance, both remembering and imagining require access of details from episodic memory as well as the integration of details into a coherent representation of an episode (Addis & Schacter, 2012). Moreover, both abilities are mediated by the same set of brain regions – namely, the default mode network (Andrews-Hanna, 2012). The present experiment endeavours to examine the impact of repeated suppressive attempts on imagined events. Despite sharing key similarities, it is not known whether the suppressive mechanisms known to influence the accessibility of memories of experienced past events will have similar effects on memories of imagined future events.

Secondly, in a seminal contribution, Anderson and Green (2001) described a method, the *Think – No-Think (TNT)* task, which has provided researchers with a laboratory tool for studying the memorial

CONTACT Nathan A. Ryckman n.ryckman@auckland.ac.nz

consequences of active thought suppression. In a TNT paradigm, participants first learn a series of paired stimuli (e.g. words and photographs). One member of each pair serves as cue, while the other serves as target. Cue stimuli are then repeatedly presented, accompanied by a signal that indicates whether the non-presented target should be rehearsed (i.e. think) or suppressed (i.e. no-think). Some cue stimuli are withheld from this phase and serve as cues for targets in a baseline condition, comprising items that are neither rehearsed nor suppressed. No-think targets have been found to be remembered below a baseline level for verbal (Anderson & Green, 2001; Fischer, Diekelmann, & Born, 2011; Lambert, Good, & Kirk, 2010; though for null effect, see Bulevich, Roediger, Balota, & Butler, 2006) and non-verbal (Depue, Banich, & Curran, 2006; Depue, Curran, & Banich, 2007; Hansylmayr, Leipold, & Bäuml, 2010) stimuli (for review, see Anderson & Huddleston, 2012).

Building upon both previous TNT and imagined event work, we examined intentional memory suppression experimentally, not by assigning participants to conditions involving (or not involving) unpleasant real events, but by measuring memory for imagined scenarios involving emotionally negative and positive autobiographical episodes (Szpunar, Addis, & Schacter, 2012). D'Argembeau, Renaud, and Van der Linden (2011) observed participants spontaneously experience an average of 59 future-oriented thoughts per day. Thus, outside the laboratory people appear to frequently imagine (i.e. *simulate*) fictional future events. Nearly two-thirds of these everyday imagined future events were reportedly emotional in nature, suggesting a disposition towards simulating events that have emotional valence rather than emotionally neutral events.

We used a procedure based on Anderson and Green's (2001) TNT task to assess the effects on memory of rehearsing or actively suppressing thoughts about imagined personal scenarios that were either emotionally negative or positive. Initially, participants were presented with sets of three cue words, representing a person, a place, and an object, and generated an imagined autobiographical event involving all three elements. During the second stage of the procedure, participants were presented with pairs of cue words, drawn from the original triplets, and were asked to either rehearse the previously imagined event (*Think* condition) or to actively avoid thinking of the event (*No-Think* condition). One third of the episodes imagined at the beginning were assigned to a baseline condition, involving neither rehearsal, nor suppression. If intentional suppression of an unpleasant memory (albeit memory for an *imaginary* episode) causes a reduction in the ability to recall that memory subsequently, then the accuracy of recalling imagined events, assessed during the final stage of our procedure, will be significantly lower for unpleasant events assigned to the *No-Think* condition, compared to recall of unpleasant events assigned to the baseline or *Think* conditions.

To our knowledge, this is the first study to combine the assessment of memory for imagined emotional episodes with a *TNT* procedure. A number of earlier studies provide some evidence to suggest that negative future simulations may be particularly susceptible to suppression. For example, Szpunar et al. (2012) assessed participant memory for simulations of future events and found accelerated forgetting of details associated with emotionally negative simulated events, compared to neutral or positive events. In the context of the *TNT* task, modulation of memory performance by emotional valence has been observed in several studies, with greater memory suppression being associated with negative emotional valence (Depue et al., 2006; Depue et al., 2007; Lambert et al., 2010). Recently, Noreen and MacLeod (2013) examined participant's memory for the details of past autobiographical events in the context of a *TNT* procedure. In Experiment 1, memory suppression was observed for recall of details associated with emotionally negative memories, but not for recall of emotionally positive memories. However, in Experiment 2, memory suppression was observed for both positive and negative episodes. Thus, previous evidence gathered both in the context of memory for imagined futures and in the context of the *TNT* memory suppression technique is consistent with the prediction that memory for emotionally negative imagined events will be worse for events assigned to the *No-Think* condition, compared to baseline memories or memories that have been rehearsed.

1. Method

1.1. Participants

Seventy-one University of Auckland students participated in the experiment during a laboratory session of a senior year Psychology course. Fifty-one participants (mean age = 21.73) successfully completed the

paradigm while adhering to instructions. Thirteen participants were excluded for ignoring instructions and averting their fixation from the display during the TNT phase. Failure to adhere to instructions was carefully monitored by the experimenter and trained research assistants, as well as proffered by participants in final debriefing. Seven participants were excluded for failing to reach a 50% accuracy criterion.

1.2. Materials

The experimental paradigm was presented using E-Prime 2.0 software. Rather than using stimuli pairs as in past TNT experiments, stimuli sets consisted of three nouns (i.e. noun triads). A total of 25 generic noun triads were used; 1 practice triad and 24 experimental triads. Each triad contained a person, place, and an object (e.g. "MOTHER ISLAND BICYCLE"). During the retention interval, participants also completed a survey package, including the Zimbardo Time Perspectives Inventory (Zimbardo & Boyd, 1999), the Neuroticism and Lie subscales of the Eysenck Personality Questionnaire – Revised (EPQ-R; Eysenck, Eysenck, & Barrett, 1985), and a brief inventory regarding suppression habits and attitudes (Retrospective-Prospective Suppression Inventory; Ryckman & Lambert, 2015). Psychometric data from all three survey instruments is to be included in a larger dataset that is being collected as part of an ongoing study of memory suppression in our laboratory and will not be reported here.

1.3. Procedure

Participants were first exposed to the 25 noun triad trials. For each triad, participants were instructed to imagine a future event, involving all three triad members, which could potentially occur within the next five years. Furthermore, participants were instructed that if the triad items were presented in blue text that the imagined event should be emotionally negative and that if the text was orange then the imagined event should be emotionally positive. The emotional valence instruction for each triad was counterbalanced between participants. All noun triads involved people, places, and things that are all commonplace in Auckland life. Triads were presented for 8 s followed by a screen where participants provided a brief description of the imagined event, with an emphasis on providing as much detail as possible without worrying about grammatical structure (e.g. "on a tropical island with mother, rent bikes and explore the island, sunny day, picnic, friendly locals"). Participants had up to 30 s to describe the imagined event, but could press the enter key to move on when they were satisfied with their description. Each trial concluded with three phenomenological ratings, made on a 5-point likert scale:(1) how similar the future event was to past experiences or thoughts, ranging from "the imagined event was entirely unique" to "the imagined event happened before"; (2) how detailed the future event was, ranging from "the imagined event has virtually no detail" to "the imagined event was as vivid as a memory for an actual experience"; and (3) how emotional the future event was, ranging from "the imagined event was extremely emotionally negative" to "the imagined event was extremely emotionally positive".

In the subsequent TNT phase, participants were provided with two members of a triad (triad-pair) in either red or green text, which were respectively associated with think and no-think instructions. For think trials, participants were instructed to mentally rehearse the non-presented triad member and the event that was imagined for the triad. For no-think trials, participants were instructed to avoid thinking of both the non-presented target and the associated imagined event. Sixteen triads were represented in the TNT phase (8 think and 8 no-think). The eight non-presented triads served as baseline triads. Of the 16 triads in the TNT phase, 8 were emotionally positive and 8 were negative. Each triad-pair was presented 16 times over the course of 4 equal, randomized blocks for 4.5 s per trial. Trials were separated by a 500 ms interstimulus interval featuring a central fixation cross. Following completion of the TNT phase, participants were given 10 min to fill out the survey package. Lastly, participants completed a probed-recall test. Triad-pairs from all 24 triads were present in this phase. Trials in the final-probed-recall test began with the presentation of a triad-pair for 8 s, and participants responded by typing the appropriate target. Triad-pairs were presented in black text in this phase, precluding the colour of the text (blue or orange) from providing the emotional context for the triad. This was followed by providing the three phenomenological ratings for the pertinent simulation as it was currently imagined. If participants could not recall the target, the experiment moved on to the next trial after 8 s. Phenomenological ratings were only included in the dataset for those trials where participants recalled the target item of the noun triad correctly.

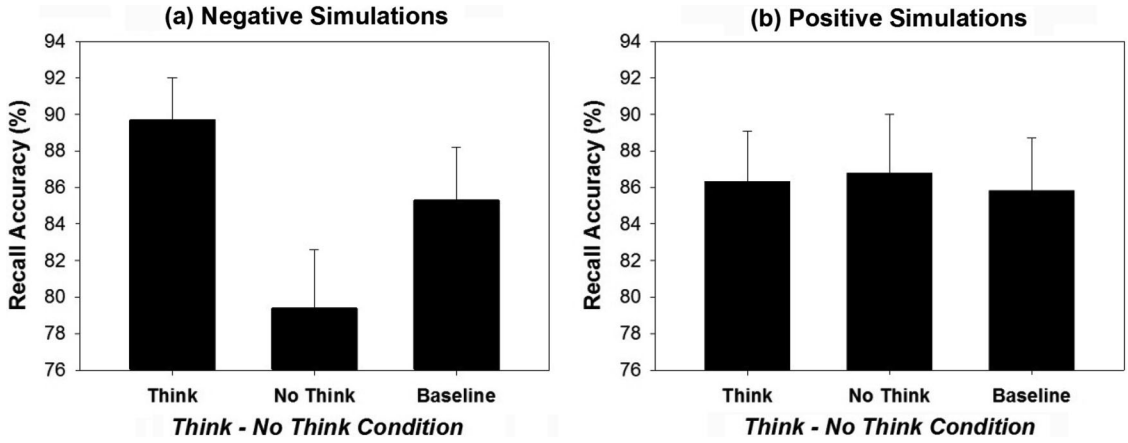

Figure 1. Mean percentage of simulation targets accurately recalled in the Think, No-Think, and Baseline conditions of the experiment by emotional valence. Error bars represent SE.

2. Results

2.1. Recall accuracy

Participant accuracy was assessed according to the following criteria. If the target word was correct apart from a simple typographical error (e.g. *siblin* when the target was *sibling*) or if more specific exemplar of the target was provided (e.g. *brother* for the target *sibling*), then it would be assessed as correct. Accuracy was determined by two independent markers (inter-rater reliability $r = .920$). Furthermore, inclusion of participants in our analyses was determined based on a 50% criterion accuracy score.

The accuracy with which participants recalled the third element of imagined autobiographical episodes, given the first two elements as cues, is summarised in Figure 1. The prediction that recall of emotionally negative memories assigned to the *No-Think* condition would be worse than recall of both rehearsed memories and baseline memories was tested with a repeated measures analysis of variance comparing the accuracy of recalling negative memories in the three instructional conditions (*No-Think*, baseline, and *Think* – see Figure 1, left panel). The main effect of memory instruction was significant, $F(2,100) = 4.91$, $MSE = 13.596$, $p = .009$. Moreover, planned contrasts revealed that recall of negative memories in the *No-Think* condition was reliably worse than recall of memories in both the *Think* condition [$t(50) = 3.12$, $p = .002$] and the baseline condition [$t(50) = 1.73$, $p = .045$].

The accuracy of recalling positive memories in the three memory instruction conditions (see Figure 1, right panel) did not differ, $F(2, 100) < 1$, $MSE = .122$. In an omnibus analysis, the interaction between memory instruction and emotional valence approached statistical significance, $F(2,100) = 2.88$, $MSE = 7.597$, $p = .06$.

2.2. Phenomenological ratings

A Wilcoxon Signed-Rank test was used to compare the non-parametric phenomenological data between pre-TNT and post-TNT rating instances. The analysis showed that ratings did not differ as a function of TNT instruction (all Z-scores ≤ 1.484), so we collapsed ratings between rating occasions and TNT instruction category. Subsequent Wilcoxon tests showed that the differences between positive and negative valence target ratings were not significant for ratings of detail, but positive valence targets were rated as being more positively valenced ($Z = -6.096$, $p < .001$) and more similar to past experiences or thoughts ($Z = -3.975$, $p < .001$) than negative valence targets. Table 1 presents mean phenomenological ratings for positive and negative valence imagined events.

Table 1. Mean phenomenological ratings (standard deviations).

Emotional valence	Detail	Emotionality	Similarity
Positive	3.06 (.53)	3.62 (.36)	2.29 (.75)
Negative	2.96 (.60)	2.20 (.50)	1.87 (.57)

3. Discussion

Our results confirmed our prediction that intentional suppression of thoughts about emotionally negative

imagined future episodes would reduce participant ability to recall those events subsequently. This finding extends the literature in two important ways. Firstly, it shows that performing a *TNT* procedure influences recall, not only of relatively artificial stimulus materials, such as words or pictures (Depue et al., 2006, 2007; Lambert et al., 2010), but also memory for imagined autobiographical episodes. This complements Noreen and MacLeod (2013) who found *TNT* instructions influenced memory for details associated with real autobiographical episodes. Secondly, these results demonstrate that accelerated forgetting of emotionally negative autobiographical simulations occurs not only as the result of passive forgetting (Szpunar et al., 2012), but also when intentional suppression is involved. Our finding that the deliberate suppression of negative emotional simulations reduced the ability to recall those simulations complements findings by Szpunar et al. (2012) who observed negative emotional simulations were forgotten more rapidly over time, than positive or neutral simulations.

One major difference between the current study and Noreen and MacLeod (2013) who also investigated *TNT* suppression effects in the domain of autobiographical memory is temporal direction – the memory for possible future events and past events, respectively. However, the two studies also differ in several other important respects, most notably the method of memory assessment. Noreen and MacLeod (2013) asked participants to recall a memory for a real past event in response to a cue word, such as *barbecue*. After performing a *TNT* procedure, recall of details concerning the causes, consequences, and personal meaning of these memories was assessed. When a strict scoring criterion was adopted, involving correct reproduction of all three details, correct recall of emotionally negative memories was worse in the *No-Think* condition, compared to baseline. However, this does not imply the *TNT* procedure caused complete forgetting. Representations of the autobiographical memories elicited in the experiment would presumably be relatively well consolidated and long-standing. Rather, as the title of their paper (*It's all in the detail*) makes explicit, the effect reported by Noreen and MacLeod (2013) involved forgetting details generated at the beginning of the session, in the process of *re*-remembering details for a recalled memory. In the current experiment, participants did not recall an existing memory, and then attempt to re-remember the details of that memory. Rather, participants imagined a novel, future scenario involving three arbitrarily chosen elements (person, place, and object). The memory suppression effect observed here reflected failure to recall a representation of the third element of the simulation, given the first two elements as cues. Thus, while both studies involved assessing autobiographical memory in the context of a *TNT* procedure, both the tasks and dependent measures employed were very different. Moreover, this consideration cautions against the over-interpretation of our results. We have demonstrated that participant memory for one attribute, the target, of the simulated event becomes less accessible as a result of thought suppression. It is still an open question whether a participant's episodic memory for a future event was suppressed in its entirety.

The term repression is often taken to imply dramatic and complete (though not irreversible) forgetting of a traumatic event. The current results and findings from the *TNT* method in general, provide little or no support for the existence of such a process. The degree of forgetting observed in previous *TNT* research has generally been modest, amounting to a 5%–15% reduction in recall (Levy & Anderson, 2008; Lambert et al., 2010), and in the current study, the 6% difference in recall between baseline and *No-Think* conditions was well within this range. Effects of this magnitude suggest a more gradual form of memory inhibition, in which intentional cognitive avoidance leads to progressive reduction in the availability of a memory. In view of this, it may be preferable to use a more neutral term, with less theoretical 'baggage' (e.g. memory inhibition) when discussing *TNT* effects. Given, the ubiquity of inhibitory processes in other theoretical contexts, for example, in accounts of perception and attention, the broad concept of memory inhibition may provide a less tendentious explanatory framework for discussing effects of the kind described here. It may well be possible that some participants in the present study were utilising the cognitive strategy of thinking of alternative future scenarios to occlude the originally imagined event, rather than engaging in a directly suppressive strategy. While these two methods of intentional forgetting were found to use distinct neural mechanisms on a *TNT* paradigm (Benoit & Anderson, 2012), they both resulted in comparable degrees of forgetting.

There is an obvious discrepancy between the impaired recall of negative memories described

here, and observation that severely negative and traumatic memories are often experienced as intrusive (McNally, 2003), despite explicit attempts to avoid thinking about those events. One modest theoretical proposal that may account for this discrepancy is simply that memory availability is subject to a multidimensional nexus of potentially countervailing influences. In addition to their valence (positive or negative), emotional stimuli are also often characterised in terms of the arousal that they evoke (Bradley & Lang, 1994; Kensinger, 2009a, 2009b). The apparent discrepancy between hyper-accessibility of traumatic memories, and impaired recall of negative memories, as described here, and previously (Depue et al., 2006, 2007; Noreen & MacLeod, 2013)could potentially be resolved via the proposal that while negative emotional valence coupled with thought-avoidance tends to reduce memory availability, arousal also exerts a powerful influence, with increasing arousal leading to increased memory availability.

Such a proposal would be broadly consistent with approaches to memory that view the construction of both past experiences and future simulations in terms of their adaptive consequences for future behaviour (Schacter & Addis, 2007; Schacter, Guerin, & St. Jacques, 2011). With regard to future behaviour, it may be adaptive for the cognitive system to discard some categories of negative emotional experience, such as being held up in traffic, but not others, such as being held up in an armed robbery. This line of theorising suggests fruitful avenues for further investigation, using the technique described here. For example, a study where the valence and arousal associated with future simulations are manipulated independently would be valuable. The effects of a *TNT* procedure on memory for emotional simulations that are strongly negative *and* highly arousing (e.g. memory for an imagined scenario where a fatal accident involving a loved one is witnessed) would be of particular interest. When participants are instructed to simulate emotionally negative simulations they tend to simulate mildly negative events, as seen in the present study (see Table 1). Including a cue for emotional *intensity* may allow for simulations of traumatic events to be compared to mildly negative simulations, and the same for the emotionally positive spectrum. Exploring this issue using imagined events may be less problematic ethically than using a procedure where participants recall traumatic experiences that have really happened.

When participants imagined emotionally positive simulations, recall accuracy was similar in the *No-Think*, *Baseline*, and *Think* conditions. These data parallel those observed in earlier work investigating effects of emotional valence, in the context of *TNT* procedures (Lambert et al., 2010; Noreen & MacLeod, 2013, Experiment 1). Memory for positive emotional episodes, like their negative counterparts, are likely to be affected by multiple influences, associated with the future behavioural consequences of reconstructing a memory or a imagining a future event. For example, the intrinsic reinforcement associated with simulating a positive event, such as a desirable romantic encounter, may tend to counteract the inhibitory effects of engaging in intentional suppression.

Unlike the current study, Noreen and MacLeod (2013) in their second experiment did find a discrepancy in participant ability to suppress emotionally positive material. One possible reason for this discrepancy is the phenomenological difference between real and imagined events. Whereas the autobiographical stimuli employed by Noreen and MacLeod were inherently self-relevant, our stimuli were of simulated events that had never been previously experienced. Imagined events that were emotionally negative were rated as being significantly less similar to past experiences and thoughts than imagined events that were emotionally positive. This may indicate a general unwillingness to simulate negative events which relate to personal experiences. Alternatively, people may generally have a larger pool of emotionally positive content encoded from which to draw, increasing the likelihood for similarities with novel imagined events.

Still, we did observe reliable forgetting for negatively valenced no-think targets. If decreased recall for negative no-think targets was simply due to reduced phenomenological similarity, we should have found a global decrease for all negatively valenced target conditions. This was not the case. Furthermore, while phenomenological similarity ratings differed between valences, phenomenological detail ratings did not. That is, despite being less similar to personal experiences, both positive and negative imagined events were reported to have been simulated with similar subjective detail. This result differs from those reported by Szpunar et al. (2012) who showed positive imagined events were rated as having more detail than negative imagined events. However, if a reduction in recalled detail contributes to the forgetting of imagined events then we should have found

equivalent reports of detail across all negatively valenced conditions. Again, this was not the case. This suggests that phenomenological detail plays different roles in target recall over time when compared to after repeated suppressive attempts.

4. Conclusion

Intentional suppression of thoughts about emotionally negative future simulations reduced participant ability to recall these imaginary events subsequently. Because imagining the future and recalling the past appears to involve similar psychological and neural processes, this finding lends support to the view that intentional avoidance of thoughts about emotionally negative episodes may inhibit representations of those memories, progressively reducing their availability to recall.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Donna Rose Addis http://orcid.org/0000-0002-6231-1491

References

Addis, D. R., & Schacter, D. L. (2012). The hippocampus and imagining the future: Where do we stand? *Frontiers in Human Neuroscience*, *5*, 173.

Anderson, M. C., & Green, C. (2001). Suppressing unwanted memories by executive control. *Nature*, *410*(6826), 366–369.

Anderson, M. C., & Huddleston, E. (2012). Towards a cognitive and neurobiological model of motivated forgetting. In R. F. Belli (Ed.), *True and false recovered memories: Toward a reconciliation of the debate* (pp. 53–120), Vol. 58: Nebraska Symposium on Motivation. New York: Springer.

Andrews-Hanna, J. R. (2012). The brain's default network and its adaptive role in internal mentation. *Neuroscientist*, *18*(3), 251–270.

Benoit, R. G., & Anderson, M. C. (2012). Opposing mechanisms support the voluntary forgetting of unwanted memories. *Neuron*, *76*, 450–460.

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavioral Therapy & Experimental Psychiatry*, *25*, 49–59.

Bulevich, J. B., Roediger, H. L., Balota, D. A., & Butler, A. C. (2006). Failures to find suppression of episodic memories in the think/no-think paradigm. *Memory and cognition*, *34*(8), 1569–1577.

D'Argembeau, A., Renaud, O., & Van der Linden, M. (2011). Frequency, characteristics, and functions of future-oriented thoughts in daily life. *Applied Cognitive Psychology*, *25*(1), 96–103.

Depue, B. E., Banich, M. T., & Curran, T. (2006). Suppression of emotional and nonemotional content in memory. *Psychological science*, *17*(5), 441–447.

Depue, B. E., Curran, T., & Banich, M. T. (2007). Prefrontal regions orchestrate suppression of emotional memories via a two-phase process. *Science*, *317*(5835), 215–219.

Erdelyi, M. H. (2006). The unified theory of repression. *Behavioural and Brain Sciences*, *29*, 499–551.

Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences*, *6*(1), 21–29.

Fischer, S., Diekelmann, S., & Born, J. (2011). Sleep's role in the processing of unwanted memories. *Journal of sleep research*, *20*(2), 267–274.

Hansylmayr, S., Leipold, P., & Bäuml, K. (2010). Anticipation boosts forgetting of voluntarily suppressed memories. *Memory*, *18*(3), 252–257.

Kensinger, E. A. (2009a). Remembering the details: Effects of emotion. *Emotion Review*, *1*, 99–113.

Kensinger, E. A. (2009b). What factors need to be considered to understand emotional memories? *Emotion Review*, *1*, 120–121.

Kihlstrom, J. (2002). No need for repression. *Trends in Cognitive Sciences*, *6*, 502.

Lambert, A. J., Good, K. S., & Kirk, I. J. (2010). Testing the repression hypothesis: Effects of emotional valence on memory suppression in the think-no think task. *Consciousness and cognition*, *19*(1), 281–293.

Levy, B. J., & Anderson, M. C. (2008). Individual differences in the suppression of unwanted memories: The executive deficit hypothesis. *Acta Psychologica*, *127*, 623–635.

McNally, R. J. (2003). *Remembering Trauma*. Cambridge, MA: Belknap Press/Harvard University Press.

Noreen, S., & MacLeod, M. D. (2013). It's all in the detail: Intentional forgetting of autobiographical memories using the autobiographical think/no-think task. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *39*(2), 375–393.

Ryckman, N. A., & Lambert, A. J. (2015). Unsuccessful suppression is associated with increased neuroticism, intrusive thoughts, and rumination. *Journal of Personality and Individual Differences*, *73*, 88–91.

Schacter, D. L., & Addis, D. R. (2007). The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. *Philosophical Transactions of the Royal Society (B)*, *362*, 773–786.

Schacter, D. L., Addis, D. R., & Buckner, R. L. (2007). The prospective brain: Remembering the past to imagine the future. *Nature Reviews Neuroscience*, *8*, 657–661.

Schacter, D. L., Guerin, S. A., & St. Jacques, P. L. (2011). Memory distortion: An adaptive perspective. *Trends in Cognitive Sciences*, *15*(10), 467–474.

Szpunar, K. K., Addis, D. R., & Schacter, D. L. (2012). Memory for emotional simulations: Remembering a rosy future. *Psychological Science*, *23*(1), 24–29.

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable, individual-differences metric. *Journal of Personality and Social Psychology*, *77*(6), 1271–1288.