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Influence of age, thought content, and anxiety on suppression of intrusive thoughts

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ABSTRACT

Understanding differences in responses following attempts to suppress versus simply monitor intrusive thoughts is important given the established relationship between intrusive thinking and numerous forms of psychopathology. Moreover, these differences may vary as a function of age. Because of the links between aging and both enhancement in emotion regulation skills and decline in inhibition skills, older and younger adults were expected to differ in their responses (e.g., experience of negative affect and thought recurrence) to attempts at suppressing intrusive thoughts. This study examined whether efforts to suppress thought content that varied in valence and age-relevance differentially affected older ($N = 40$, aged 66–92) and younger ($N = 42$, aged 16–25) adults' ability to inhibit intrusive thought recurrence and their resulting negative affect. Interestingly, older adults experienced *less* recurrence for most thoughts than younger adults. Also, for several dependent variables (negative affect and perceived difficulty suppressing intrusive thoughts), older adults showed less decline in their magnitude of response across thinking periods (i.e., from suppression to monitoring) than did younger adults. These age effects were not generally moderated by level of trait anxiety, though higher anxiety did predict intrusive thought responding in expected directions, such as greater negative affect. These findings point to independent influences of age and anxiety, and suggest a complex mix of risk and protective factors for older adults' responses to intrusive thoughts.

Although most everyone experiences intrusive thoughts on occasion (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984), cognitive theories of obsessive compulsive disorder (OCD) suggest that it is the manner in which one interprets and responds to these repetitive, unwanted thoughts that influences both the negative affect associated with the thought and the frequency with which the thought recurs (e.g., Langlois, Freeston, & Ladouceur, 2000; Obsessive Compulsive Cognitions Working Group, 1997; Rachman, 1998; Salkovskis, 1998). Ongoing attempts to suppress unwanted thoughts, for example, is one response that has been found to promote later thought recurrence[1] and negative affect (Trinder & Salkovskis, 1994; Wegner & Zanakos, 1994). Studies examining responses to intrusive thoughts have primarily focused on younger adults, neglecting the potential impact of developmental changes over the lifespan that could lead to differences in responses to intrusive thoughts (Calamari, Janeck, & Deer, 2002). Investigating age differences in responses to intrusive thoughts can lead to an enhanced understanding of both emotional processing in the context of healthy aging, as well as gerontological anxiety, a critical but understudied problem (e.g., Schaub & Linden, 2000; Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010).

Cognitive models of intrusive thoughts in the context of OCD emphasize how interpretations of intrusive thoughts as personally significant lead to increases in negative affect and subsequent recurrence of the thought (Rachman, 1997, 1998); however, thought content can also play a significant role. Rowa and Purdon (2003) found that intrusive thoughts with content that contradicted a person's values or self-concept were rated as more upsetting and were appraised as more negative than thoughts that were less contradictory to self-concept. Additionally, using a thought suppression paradigm similar to the one used in the current study, Corcoran and Woody (2009) asked religious and non-religious participants to suppress (or they were explicitly asked not to suppress) a blasphemous thought. The researchers found that the religious participants experienced greater anxiety during the task and greater thought frequency upon directed thought suppression

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[1] We use the term "recurrence" to reference any occurrence of the thought during a thinking period, regardless of whether it was a suppression or monitoring period. Note, we construe the term "rebound" to have a more specific meaning, reflecting the recurrence of a thought following a period of prior suppression. Given rebound is typically measured as degree of recurrence following suppression relative to degree of recurrence following monitoring, we do not use the term rebound in this study because the current study design did not contrast suppression versus monitoring instructions during the first thinking period.

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compared to the non-religious participants. This research points to the likely role of personal and (sub)cultural relevance of the content of intrusive thoughts in determining responses to such thoughts.

Age is another factor that is commonly associated with considerable differences in what goals and values are deemed important (Carstensen, 1993, 2006), and recent evidence suggests emotional reactivity can vary as a function of the age-relevance of the stimuli (Kunzmann & Grühn, 2005; Teachman & Gordon, 2009). Yet, there is a dearth of research examining age-related differences in responding to intrusive thoughts, both in general and specific to intrusive thought content that varies by typical, lifespan development concerns.

Investigating age differences in responding to different types of intrusive thoughts following thought suppression attempts can help determine whether hypothesized differences are due mainly to age variance in the thought suppression process (e.g., because of age-related differences in emotion reactivity and cognitive processing) or to the impact of thought content (e.g., thoughts that vary in age-relevance). We investigated the independent and interactive influences of age and trait anxiety on older and younger adults' thought recurrence and negative affect when attempting to suppress thoughts that are relevant to the common concerns of their respective age group, compared to other types of thoughts, including an age-neutral positive thought and an age-neutral negative thought.

1. Age and thought suppression ability

Increasing age is associated with a myriad of cognitive changes, including deficits in working memory (Salthouse, 1990) and processing speed (Salthouse, 1996). Some of these cognitive changes are linked to reductions in certain inhibitory abilities (Dempster, 1992; May, Hasher, & Kane, 1999; Zacks & Hasher, 1997), which are highly relevant to thought suppression capability. Specifically, the suppression of intrusive thoughts has been linked to the so-called deletion function of inhibition, which involves suppression of no-longer-relevant information in working memory once a goal or task has changed (Zacks & Hasher, 1997). The deletion function has been found to deteriorate with chronological age (e.g., Ikier, Yang, & Hasher, 2008; Malmstrom & LaVoie, 2002; Witthöft, Sander, Süß, & Wittmann, 2009), potentially making thought suppression more difficult for older adults. Additionally, several aspects of controlled processing deteriorate with age (Hasher, Zacks, & May, 2000), which may hinder thought suppression performance, following from Wegner's (1994) ironic process model. This model proposes that thought suppression involves a controlled process whereby people consciously try to not think about a certain thought (in addition to a relatively more automatic monitoring process). Taken together, these age-related changes suggest that older adults might experience greater recurrence of intrusive thoughts compared to younger adults.

Notwithstanding, Magee and Teachman (2012) did not find age differences in the frequency and duration of intrusive thought recurrences during a directed thought suppression paradigm, and instead found significant age differences in reports of *subjective* difficulty suppressing the thoughts. Thus, it may be perceived difficulty, rather than actual suppression performance, that distinguishes older and younger adults' responses to suppressing intrusive thoughts. Perhaps older adults are able to compensate for their losses in inhibition ability for short bursts of time so performance is not impaired (see model of aging and Selection, Optimization, and Compensation; Baltes, 1987; Baltes & Baltes, 1990), but doing so comes at a cost (hence, they describe the task as more difficult). Indeed, Magee and Teachman found that perceived effort at thought suppression mediated the finding that older adults perceived greater difficulty suppressing thoughts than younger adults. If older adults are able to successfully compensate for losses in inhibition and other controlled processes, there may be no age differences in thought recurrence, frequency and duration, or older adults could even experience less recurrence if compensation was very effective.

Yet an alternative possibility is that suppression difficulties only become exaggerated for older adults if the thought is one that is personally meaningful to them. Suppressing a meaningful intrusive thought, such as one that is age-relevant, may require additional inhibition skills because of the greater processing demands activated. This question is investigated in the current study by assessing suppression ability for multiple thoughts that vary in age-relevance.

2. Age and negative affect

Despite significant reductions in certain cognitive abilities, studies suggest that older adults are better able to regulate many facets of emotional experience and expression compared to younger adults (Gross et al., 1997). Notably, researchers found that although the intensity of self-reported emotions did not vary as a function of age, suggesting intact emotion sensitivity, age was associated with increases in emotional stability (as indicated by less lability across time; Carstensen et al., 2010). Similarly, research from our laboratory revealed that older adults started with and maintained steadier positive affect during a directed thought suppression paradigm than did younger adults (Magee & Teachman, 2012). With respect to negative affect, older adults reported lower initial levels of negative affect at baseline than younger adults, but similar intensity of negative reactivity to the intrusive thought. In line with prior findings of less change in emotions over time, Magee and Teachman found that older adults' negative affect decreased less steeply across thinking periods than did younger adults'. These findings suggest a pattern of comparable negative reactivity to intrusive thoughts across age groups, but reduced affective change across time among older adults.

3. Influence of trait anxiety

Older adults often score lower than younger adults on measures of trait anxiety (Teachman, 2006), but there has been little prior literature examining the role of anxiety in influencing age differences in responses to intrusive thoughts. Independent of age, higher levels of trait anxiety have been associated with greater suppression effort (Erskine, Kvavilashvili, & Kornbrot, 2007), and greater negative affect following directed thought suppression attempts (Magee, 2010; though see Tolin, Abramowitz, Hamlin, Foa, & Synodi, 2002). However, this does not mean actual thought recurrence will be greater. In fact, in a meta-analysis examining the link between psychopathology and thought recurrence following thought suppression, Magee, Harden, and Teachman (2012) found a small effect indicating higher trait anxiety was actually associated with less recurrence. There are many open questions about how age and trait anxiety might interact to influence thought suppression outcomes. Interestingly, Steinman, Smyth, Bucks, MacLeod, and Teachman (in press) found the effects of age and anxiety were independent in a study of expectancy biases. Similarly, Magee did not find that age interacted with trait anxiety to predict thought suppression outcomes, though this study did not include an aging-relevant thought, leaving open the possibility that a more personally significant thought might lead to more interactive effects.

4. Overview and hypotheses

In this study, older and younger adults were asked to suppress and then monitor four thoughts of varying content: