



Psychometric qualities of the Thought Suppression Inventory-Revised in different age groups



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ABSTRACT

Intrusive thoughts about negative events are core symptoms of several psychiatric disorders. Because current instruments for the assessment of thought suppression are unsatisfactory, we developed and evaluated the dimensionality and validity of a questionnaire that distinguishes between three major facets of thought suppression – intrusions, suppression attempts, and effective suppression – that affect psychopathology distinctly. Participants ($N = 784$) divided over three age groups, 25 years and younger ($n = 351$), between 26 and 50 years ($n = 202$), and 51 years or older ($n = 231$), completed the Thought Suppression Inventory-Revised. The data were analyzed with sophisticated nonparametric item response theory. Exploratory Mokken scale analysis revealed a three-factor structure, which was affirmed with confirmatory analyses. The Suppression Attempts scale appeared to be a weak scale, specifically in the two older age groups. Since suppression most likely depends on inhibitory ability – which declines with age – suppression attempts probably have increasingly variable outcomes (i.e., failure or success), which complicates measuring this factor. Overall, our findings suggest that three facets of thought suppression can be measured especially in younger individuals, but that for individual measurements particularly in the older age groups the Suppression Attempts scale has to be used with caution.

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1. Introduction

Unwanted, intrusive thoughts about negative events are central to a number of psychological disorders, such as obsessive–compulsive disorder (OCD; Julien, O'Connor, & Aardema, 2007), post-traumatic stress disorder (PTSD; Ehlers & Clark, 2000; Shipherd & Salters-Pedneault, 2008), and depression (Wenzlaff, 2005; Wenzlaff & Wegner, 2000). Such thoughts are also common in the daily lives of healthy individuals (Brewin, Christodoulides, & Hutchinson, 1996; Clark & Rhyno, 2005; Rachman & de Silva, 1978) and it is self-evident that people occasionally attempt to suppress these thoughts. The extent to which individuals are successful in doing this varies and likely differs with age; therefore studying thought suppression in non-clinical individuals of different ages could serve as a useful model for pathological thought suppression. However, current instruments for thorough assessment of thought suppression are unsatisfactory, because questionnaire items do not have simple structure or are unscalable. Thus, the current study set out to develop an instrument that properly distinguishes between

three major facets that make up the process of thought suppression – intrusions, suppression attempts, and effective suppression – in several age groups.

The development of an instrument that encompasses all aspects of thought suppression is especially relevant because in the last decade, the idea that thought suppression is always ineffective and counterproductive has been challenged by numerous studies. These studies either show that rebound effects – an increase of intrusive thoughts after suppression – are inconsistent (Magee, Harden, & Teachman, 2012; Purdon, 1999), or that suppressed memories can actually become less accessible (e.g., Anderson & Green, 2001; Depue, Curran, & Banich, 2007; van Schie, Geraerts, & Anderson, 2013; for reviews see Anderson & Hanslmayr, 2014; Anderson & Huddleston, 2011). Interestingly, engaging in thought suppression can also reduce the number of unwanted memories that intrude into awareness (Benoit, Hulbert, Huddleston, & Anderson, 2014; Levy & Anderson, 2012). Hence, the blanket term ‘thought suppression’ may long have been equated erroneously with ineffectiveness (e.g., in models of psychopathology; Ehlers & Clark, 2000; Rachman, 1998), while evidently it can be effective in reducing intrusive memories. Thus, if certain people are able to regulate negative affect by effectively suppressing intrusive memories that evoke feelings of fear, anxiety or anger, this could reduce psychopathological symptoms. Research on individual differences in thought suppression may shed light on why some people are better in regulating unwanted intrusive thoughts than others.

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Moreover, it is likely that thought suppression may change over an individual's lifetime, as with age – at least some – inhibitory abilities decline (Hasher & Zacks, 1988). Indeed, on a behavioral level older adults experience more pro-active interference in memory than younger adults, which is exactly what one would expect if older adults are less able to engage in inhibitory control (Biss, Campbell, & Hasher, 2013; Lustig, Hasher, & Tonev, 2001). Furthermore, decreased inhibitory control hinders older adults from intentionally forgetting unwanted episodic memories (Anderson, Reinholz, Kuhl, & Mayr, 2011). Hence, age-related decreases in inhibitory control may therefore lead to increases of intrusive, recurrent memories, which are core symptoms of psychiatric disorders such as PTSD and OCD. To determine the exact relationship between thought suppression and psychopathology, it is essential to adequately measure all aspects of thought suppression.

The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) was the first instrument enabling the assessment of individual thought suppression and its relation to psychopathology. However, the WBSI seemed to lack a consistent factor dimensionality and therefore highlights that thought suppression is not a unidimensional construct; a substantial number of studies found that at least some of the items capture another construct, namely intrusions (Blumberg, 2000; Höping & De Jong-Meyer, 2003; Luciano et al., 2006; Muris, Merckelbach, & Horselenberg, 1996; Pica, Pierro, & Giannini, 2014; Rassin, 2003; Rodríguez, Delgado, Rovella, & Cubas León, 2008; Schmidt et al., 2009; Spinhoven & Van der Does, 1999). This makes interpretation difficult because it is unclear whether a low score implies successful thought suppression, the absence of experienced intrusions, or both (Blumberg, 2000; Rassin, 2003). This continuing debate on the construct validity and the imperfections of the WBSI necessitated the development of an instrument that overcame its shortcomings by using separate scores for different constructs.

Contrary to the WBSI, the three-factor Thought Suppression Inventory (TSI, Rassin, 2003) seemed to successfully differentiate thought suppression (attempts) from intrusions, and from successful thought suppression. In a student population, Rassin (2003) showed that intrusions were strongly related to general psychopathology and obsessive-compulsive symptoms, while suppression attempts were not.² Additionally, successful suppression on the TSI correlated negatively with WBSI intrusions and suppression components, showing that the WBSI – which was intended to measure suppressing thoughts – essentially measures *failed suppression*. Thus, Rassin (2003) emphasized the inherent bias of the WBSI and introduced the TSI as an alternative questionnaire for integral thought suppression.

Though the TSI was a first instrument to assess the complete construct of thought suppression, it is not without flaw. Using sophisticated tools from modern item response theory, Wismeijer (2012) revealed that in an elderly population 8 out of 15 TSI items had unsatisfactory psychometric properties. These items did not have a simple structure or were unscalable (e.g., item 12 loaded equally on all scales 'I am able to suppress unpleasant experiences to the point that I hardly remember them'). Consequently, Wismeijer proposed rephrasing or replacing of these items.

Since the TSI proved to be psychometrically unsound and its generalizability unclear, the goal of our study was two-fold. First, we critically examined the TSI's items, developed new items, and rephrased old items. This was done in order to create a valid revised questionnaire that adequately distinguishes between thought suppression attempts, successful thought suppression and unwanted intrusive thoughts. Second, because thought suppression likely varies with age and since previous studies predominantly examined the psychometric properties of the TSI with age-restricted samples (viz., students (mean age = 20.4,

$SD = 2.5$) and the elderly (mean age = 65.0, $SD = 9.58$); Rassin, 2003; Wismeijer, 2012), our study used a broad stratified quota sample with individuals in the age range of 16 to 83 years. This allowed us to examine if the psychometric properties of the TSI-Revised (TSI-R) are widely supported by all subgroups, and not only by students, who are a commonly examined group. Additionally, we hypothesized that, as a consequence of reduced inhibitory control with age, older groups experience less effective suppression and more intrusions. Following Wismeijer (2012), modern test theory was used to explore the dimensionality of TSI-R. Modern test theory offers rich and sophisticated tools to scrutinize the psychometric properties by focusing on item responses (Reise, Ainsworth, & Haviland, 2005).

2. Method

2.1. Participants

The majority of the 784 participants in our study indicated being Dutch nationals (96.4%), while a minority had non-Dutch or dual nationalities (3.6%), though all participants spoke Dutch. The majority of our sample indicated their highest level of completed education was at undergraduate or graduate level (71.3%), followed by vocational training (17.0%), high school (10.3%), or another type of education (1.4%). Participants were divided over three age categories to ensure a diverse sample; 25 years and younger ($n = 351$, mean age = 20.2 years, $SD = 2.19$, 28.5% male), between 26 and 50 years ($n = 202$, mean age = 36.1 years, $SD = 7.79$, 33.7% male), 51 years or older ($n = 231$, mean age = 62.4 years,³ $SD = 7.61$, 42.9% male). All subjects that finished at least the TSI-R at the first testing time were requested to participate in the second testing period. Consequently, the sample measuring test-retest reliability consisted of 427 subjects (25 years or younger: $n = 82$, mean age = 22 years, $SD = 2.21$, 32.9% male; between 26 and 50 years: $n = 156$, mean age = 36.7 years, $SD = 7.87$, 32.7% male; 51 years or older: $n = 189$, mean age = 62.7 years,³ $SD = 7.68$, 43.1% male). All subjects participated voluntarily.

2.2. Questionnaires

2.2.1. Thought Suppression Inventory-Revised

The Thought Suppression Inventory-Revised (TSI-R) is a revision of the TSI (Rassin, 2003), a Dutch 15-item self-report instrument to measure successful and unsuccessful thought suppression. Items are scored from 1 *strongly disagree* to 5 *strongly agree* indicating agreement with statements such as 'I have many unpleasant thoughts'. Total scale scores are calculated by adding item scores for each of the three scales independently. Total scores range from 5 to 25, with higher scores indicating more intrusions, more suppression attempts, or successful suppression (compared to non-successful suppression). For the revised version, TSI items critiqued by Wismeijer (2012) were either rephrased or replaced, and several new items were added. Consequently, the TSI-R consisted of 21 items at the moment of testing (see Table 1, for TSI-R items)

2.2.2. White Bear Suppression Inventory

The WBSI (Wegner & Zanakos, 1994) is a 15-item self-report questionnaire measuring thought suppression. Items are scored from 1 *strongly disagree* to 5 *strongly agree* and total scores vary from 15 to 75, where higher total scores reflect a stronger tendency towards thought suppression. See Appendix A for reliability estimates (internal consistency) of our three age groups for all questionnaires besides the TSI-R.

² Note that this lack of correlation might also be attributed to relatively large measurement error – shown by the low reliability estimates (test-retest reliability = .43, Cronbach's alpha = .64) – of suppression attempts in comparison with the other constructs (Furr & Bacharach, 2014).

³ Mean age was calculated based on 230 participants for the first testing time and on 188 participants for the second testing time; one participant did not report age, only age group.

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