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Rumination and implicit avoidance following bereavement: An approach avoidance task investigation



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ABSTRACT

Background and objectives: Rumination, a risk factor in adjustment to bereavement, has often been considered a confrontation process. However, building on research on worry in generalized anxiety disorder (GAD) and rumination in post-traumatic stress disorder (PTSD), researchers recently developed the Rumination as Avoidance Hypothesis (RAH), which states that rumination after bereavement serves to avoid the reality of the loss. In the present study, RAH was tested by investigating if rumination is associated with implicit loss avoidance.

Methods: An Approach Avoidance Task (AAT) was used to assess automatic behavior tendencies. Using a joystick, 71 persons who recently lost a first-degree relative (90.1% women), pulled stimuli toward themselves or pushed them away from themselves. Stimuli represented the loss (picture deceased + loss word), were loss-related but ambiguous (picture deceased + neutral word; picture stranger + loss word), or were non-loss-related (picture stranger + neutral word; puzzle picture + X's).

Results: Participants who ruminated more were relatively faster in pushing loss stimuli away from themselves and slower in pulling loss stimuli towards themselves, implying more rumination was associated with stronger implicit loss avoidance. Effects were maintained after controlling for depressive or post-traumatic stress symptom levels, but not when controlling for prolonged grief symptom levels.

Limitations: Conjugally bereaved women were overrepresented in the sample, which limits generalizability of results. The study was correlational, precluding causal inferences.

Conclusions: In line with RAH, rumination was positively associated with loss avoidance. This may indicate that the application of exposure-based techniques can reduce rumination and loss-related psychopathology.

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Since the early days of bereavement research, behavioral theorists have considered approach and avoidance behavior to play a key role in adjustment to loss (e.g., Freud, 1917/1957; Lindemann, 1944; Ramsay, 1977; Tait & Silver, 1989). For example, Freud (1917/1957) proposed that bereaved persons should counter avoidance, by engaging in 'grief work', a cognitive process of confronting the

reality of the loss, in order to come to terms with the death of a loved one. Contemporary theorists similarly consider approach and avoidance to be central processes in understanding adjustment to bereavement (e.g., Boelen, van den Hout, & van den Bout, 2006; Bonanno & Burton, 2013; Stroebe & Schut, 2010). For example, in a cognitive-behavioral model of prolonged grief, Boelen et al. (2006) suggested that bereaved individuals may engage in avoidance of situations, places and objects, and in various cognitive avoidance strategies, such as suppression, to avoid painful aspects of the loss. Such avoidance is assumed to lead to development of prolonged grief, because it interferes with the integration of autobiographical memories about the loss with

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existing autobiographical memories (cf. a cognitive model of posttraumatic stress-disorder: Ehlers & Clark, 2000).

In line with these theories, experiential avoidance (i.e., avoidance of internal experiences such as memories, thoughts and emotions), thought suppression and deliberate avoidance of reminders of the loss are concurrently and longitudinally associated with higher depressive, post-traumatic stress and prolonged grief symptoms (e.g., Boelen & van den Bout, 2010; Boelen & van den Hout, 2008; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Eisma et al., 2013; Morina, 2011). For instance, Bonanno et al. (2005) reported that stronger deliberate grief avoidance predicted poorer long-term adjustment in a sample of bereaved individuals. Moreover, cognitive-behavioral therapies including exposure techniques aimed at confronting bereaved individuals with emotionally overwhelming aspects of the loss, have been proven effective in reducing prolonged grief symptoms (e.g., Boelen, de Keijser, van den Hout, & van den Bout, 2007; Shear, Frank, Houck, & Reynolds, 2005; Wagner, Knaevelsrud, & Maercker, 2006).

Despite the theoretical relevance and potential clinical applicability of knowledge about approach and avoidance processes in dealing with bereavement, not all typically-observed coping behavior in bereaved persons can straightforwardly be classified as falling on either side of this dimension. Most notably, rumination, thinking repetitively and recurrently about the causes and consequences of one's negative emotions (Nolen-Hoeksema & Morrow, 1991) and/or negative life-events (Michael, Halligan, Ehlers & Clark, 2007), has been conceptualized as both as an approach and an avoidance strategy. Since rumination after loss is related to increases in psychopathology and general distress (for a brief review: Eisma, Stroebe, et al., 2014), clarifying the function of rumination is critical for a better understanding of adjustment after bereavement.

In the past, bereavement researchers have often more or less explicitly assumed rumination after loss to be similar to confrontation (e.g., Michael & Snyder, 2005; Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999; Tait & Silver, 1989). For instance, Nolen-Hoeksema and colleagues characterized rumination as the "opposite to avoidance and denial/suppression" (Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999, cf. Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). According to her Response Style Theory, repetitive focus on causes and consequences of loss-related emotions fuels depression by: i) increasing availability of negative cognitions, ii) interfering with problem solving, iii) impeding instrumental behavior, and iv) driving away social support (Nolen-Hoeksema, 2001; cf. Nolen-Hoeksema et al., 2008). Similarly, self-regulation theorists consider rumination to be a discrepancy-focused thought process aimed at reducing discrepancies between a current reality a desired but yet unattained goal (e.g., Martin & Tesser, 1996). However, if a discrepancy cannot easily be resolved (e.g., when experiencing a major negative life-event), such recurrent cognitive focus on a negative topic can increase negative mood and depression.

More recently, several researchers have proposed that rumination after bereavement is an avoidance process (Boelen et al., 2006; Stroebe et al., 2007). Drawing upon research on worry in generalized anxiety disorder (e.g., Borkovec, Ray, & Stöber, 1998) and rumination after traumatic life-events (Ehlers & Clark, 2000), Stroebe et al. (2007) put forward the Rumination as Avoidance Hypothesis (RAH). This hypothesis states that chronic rumination about the loss-event and associated problems serves as an "excuse" not to face up to the most painful aspects of a loss-experience, such as the reality of the loss. Similarly, Boelen et al. (2006) argued that continuous rumination about one's own reactions and reasons why the loss occurred may be a way to "escape" from having to admit the fact of the loss and the emotions associated with it. In summary, whereas some researchers consider rumination to be a

confrontation strategy, others have suggested that it may (also) be an avoidance process.

Clarification of the function of rumination in bereavement is not only theoretically important, but may also have substantial clinical implications. Increasingly, cognitive-behavioral therapies (CBT) are being developed that target rumination and worry in order to reduce psychopathology (for a review: Querstret & Croyley, 2013). Potentially, CBT for prolonged grief may be improved by applying techniques that reduce rumination. Traditionally, it has been argued that rumination (being a confrontation process), can be disrupted by providing positive distraction, that is, by undertaking new meaningful activities (Nolen-Hoeksema et al., 2008; Papa, Rummel, Garrisson-Diehn, & Sewell, 2013). However, should rumination be an avoidance process, the exposure-based therapy could (also) be a viable strategy to break the ruminative cycle (Boelen et al., 2006; Eisma et al., 2013).

Interestingly, some recent investigations provide support for an association between rumination and avoidance after bereavement. For example, in a cross-sectional survey study in female bereaved war survivors, Morina (2011) reported a moderate association between trait rumination and experiential avoidance. Recently, Eisma et al. (2013) extended these findings by demonstrating in a large bereaved sample that the prospective relationship between rumination and prolonged grief symptom change was mediated by experiential avoidance and thought suppression. These results are in line with a larger body of survey research in non-bereaved clinical and non-clinical samples supporting an association between rumination and cognitive and emotional avoidance (e.g., Cribb, Moulds, & Carter, 2006; Dickson, Ciesla, & Reily, 2012; Giorgio et al., 2010; Kühn, Vanderhasselt, de Raedt, & Gallinat, 2012; Liverant, Kamholtz, Sloan, & Brown, 2011; Moulds, Kandris, Starr, & Wong, 2007; Wenzlaff & Luxton, 2003).

Despite the consistent association between rumination and avoidance in survey investigations, few researchers have explicitly studied the link between rumination and behavioral – as opposed to self-report – indices of avoidance. Moreover, despite considerable evidence supporting an association between rumination and cognitive biases for general negative material, such as sad faces and negative words (for a review: Koster, Delisnyder, Derakshan, & de Raedt, 2011), few studies have addressed the relationship between rumination and biases for potentially threatening material. In one study that did investigate this topic, two groups of college students (low and high ruminators) were asked to engage in relaxation or rumination, after which they were instructed to imagine the death of a loved one (Giorgio et al., 2010). It was predicted that high ruminators would show a physiological response (i.e., heart rate increase) during the imagination exercise, after relaxation but not after rumination, which would indicate emotional suppression in the latter group. However, no differences were found between the relaxation and rumination conditions in high ruminators. Instead, the expected difference was detected in the low rumination group, suggesting that emotional suppression is only observed in individuals who do not ruminate regularly. Giorgio et al. (2010) explained this finding by arguing that the negative mood induction may have led high ruminators in the relaxation condition to ruminate, whereas low ruminators in this condition were less prone to do so. This study therefore provided preliminary evidence for a role of rumination in avoidance of the emotional experiences that are associated with the loss of a loved one.

In another study, the hypothesis that grief-related rumination is associated with loss avoidance (RAH: Stroebe et al., 2007) in the presence of less-threatening negative material, was tested with an eye-tracking task in a sample of bereaved individuals (Eisma, Schut, et al., 2014). High and low ruminating individuals were asked to look repeatedly at two pictures (the deceased and a

stranger), randomly combined with loss-related, negative and neutral words. High ruminators, compared to low ruminators, were shown to avoid loss cues (i.e., picture deceased + loss-related word), and showed attentional preference of general negative information (i.e., picture stranger + negative word) on extended presentation times (>1500 ms). Notably, these effects were maintained after correcting for symptoms of prolonged grief and depression. This study therefore provided evidence that rumination shows a unique association with conscious attentional avoidance of the loss.

Given the potential theoretical and clinical implications of the function of rumination in bereavement, the relationship between rumination and loss avoidance needs to be further elucidated. Therefore, in the current investigation, the aim was to assess the link between rumination and an implicit measure of approach and avoidance, the Approach Avoidance Task (AAT; Rinck & Becker, 2007). In a typical AAT, individuals are instructed to respond with approach (i.e., pulling a joystick towards oneself; thereby making the stimulus on a computer screen larger) or avoidance (i.e., pushing a joystick away from oneself; thereby making the stimulus on a computer screen smaller) on the basis of a stimulus feature that is unrelated to the content or valence of the stimulus. In a classic application of the AAT, spider-fearful and non-spider fearful individuals were asked to respond to spider pictures or spider-free pictures, by pulling the picture towards themselves as fast as possible whenever the picture was in landscape format and pushing the picture away from themselves whenever the picture was in portrait format (Rinck & Becker, 2007). Thus, picture format served as a non-relevant cue. Trials were classified as congruent (pushing an aversive stimulus; pulling a non-aversive stimulus), or incongruent (pushing a non-aversive stimulus; pulling an aversive stimulus). The difference in reaction-times between congruent and incongruent trials, was interpreted as a measure of implicit approach and avoidance. If a person found it easier to push rather than pull a specific stimulus, this indicated an avoidance tendency for that stimulus. By contrast, if someone found it easier to pull than to push a particular stimulus, this indicated an approach tendency for that stimulus. In this particular investigation, spider-fearful individuals showed stronger avoidance tendencies for spider-pictures than participants with no fear of spiders. Since this initial research, the AAT has been successfully applied to investigate implicit approach and avoidance tendencies in many different areas, including post-traumatic stress disorder (Fleurkens, Rinck, & van Minnen, 2014), social anxiety (Heuer, Rinck, & Becker, 2007), and addiction (Cousijn, Goudriaan, & Wiers, 2011).

In the present study, a sample of recently bereaved individuals was requested to complete an AAT using previously-developed stimuli (Eisma, Schut, et al., 2014; Gündel, O'Connor, Littrell, Fort, & Lane, 2003). There were three stimulus types: stimuli that represent the loss itself (i.e., picture deceased + loss word), stimuli that are loss-related but ambiguous (i.e., picture deceased + neutral word; picture stranger + loss word) and pictures that were non-loss-related and neutral (picture stranger + neutral word; puzzle picture + X's). For details on stimulus types see 'Stimuli Development' in the Methods section. Our hypotheses were based on previous eye-tracking research by Eisma, Schut, et al. (2014), which showed that bereaved high ruminators, compared to low ruminators, avoided loss-stimuli but no other stimulus types. We expected to be able to cross-validate these findings with a different measure of avoidance behavior, the AAT. Our main prediction was therefore: More grief-related rumination would be associated with stronger avoidance of loss cues, even when correcting for currently experienced distress (i.e., symptom levels of depression, posttraumatic stress, or prolonged grief).

1. Methods

1.1. Participants

Participants were recruited from an existing pool of bereaved individuals who took part in a longitudinal study on rumination and emotional problems, and who agreed to participate in an additional laboratory study. Seventy-one individuals (90.1% female), bereaved of a first-degree relative on average 16 months ago, participated in our study. The majority of individuals had lost a partner or parent (77.5%), due to natural causes (90.1%). In the present study, we assessed current levels of grief-related rumination with the Utrecht Grief Rumination Scale (UGRS; Eisma, Stroebe, et al., 2014). Rumination scores ranged from 19 to 63 (Mean = 38.4; SD = 10.0). Sample characteristics are shown in Table 1.

1.2. Procedure

The study was approved by an official Dutch ethical review board. Before the start of the investigation, all participants were sent an information letter (describing goals of the study, advantages and disadvantages of participation, data handling, anonymity, etc.) and an informed consent form by post. Persons who decided to participate, filled out the informed consent form (which was returned by mail), and were invited to visit the laboratory. All participants were offered the opportunity to ask questions about the study over the phone and during the investigation. The study consisted of two parts. First, each participant filled out a series of questionnaires (see section: 'Questionnaires'). Second, each participant completed an AAT (see section: 'Approach Avoidance Task'). After the AAT, participants were debriefed and received a travel reimbursement form and 20 euros for their participation.

1.3. Questionnaires

1.3.1. Sociodemographic and loss-related variables

Demographic characteristics of the participant (age, sex and education level) and characteristics of the loss (relationship with deceased, time since the loss, cause of death and expectedness of the death) were assessed with a background questionnaire.

Table 1
Sample characteristics (N = 71).

Demographic variables	
Gender (N (Valid %))	
Female	64 (90.1)
Age in years (M (SD))	50.0 (12.0)
Loss-related variables	
Gender deceased (N (Valid %))	
Female	28 (39.4)
Deceased is (N (Valid %))	
Partner	37 (52.1)
Child	7 (9.9)
Parent	9 (12.7)
Sibling	18 (25.3)
Cause of loss (N (Valid %))	
Natural causes (e.g., illness, heart failure)	64 (90.1)
Violent (i.e., accident, murder, suicide)	7 (10.9)
Loss was (N (Valid %))	
Expected	39 (54.9)
Unexpected	25 (35.2)
Both or neither	7 (9.9)
Time since loss in months (M (SD))	16.7 (9.5)
Psychological variables	
Grief rumination (M (SD))	38.4 (10.3)
Symptom of depression (M (SD))	17.4 (9.3)
Symptom of post-traumatic stress disorder (M (SD))	15.2 (8.1)
Symptoms of prolonged grief (M (SD))	40.3 (20.3)

1.3.2. Grief rumination

The 15-item Utrecht Grief Rumination Scale (UGRS; Eisma, Stroebe, et al., 2014) was used to measure grief-related rumination, recurrent and repetitive thinking about the causes and consequences of the loss and related negative feelings. Participants indicated how often they had experienced certain thoughts during the past month on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). Sample items are: “How often in the past month did you wonder why it happened to you and not someone else?”, and: “How often in the past month did you analyze your feelings about the loss?” Several studies have shown that the UGRS is a reliable and valid measure of grief-related rumination (Eisma et al., 2012; Eisma, Stroebe, et al., 2014).

1.3.3. Symptoms of depression

We assessed depressive symptoms with the 20-item Center for Epidemiologic Studies Depression Scale (CESD Scale; Beekman, Deeg, Limburg, de Vries, & van Tilburg, 1997; Radloff, 1977). On the CESD Scale respondents indicated how frequently they had exhibited certain depressive behavior in the past week on a 4-point scale ranging from 0 (*rarely*) to 3 (*most of the time*). Multiple studies have confirmed the reliability and validity of the CESD Scale in clinical and non-clinical samples (Beekman et al., 1997).

1.3.4. Symptoms of post-traumatic stress

We measured symptoms of post-traumatic stress disorder (PTSD), using the PTSD Symptom Scale (PSS; Engelhard, Arntz, & van den Hout, 2007; Foa, Cashman, Jaycox, & Perry, 1997). The PSS consists of 17 statements about PTSD symptoms, based on the PTSD criteria in the DSM-IV (APA, 2000). Respondents indicated how frequently they had experienced each symptom in reaction to the loss over the past month, on a 4-point scale ranging from 0 (*not at all*) to 3 (*almost always*). The PSS showed good reliability and acceptable validity in a previous study in a sample of persons who had experienced a traumatic event (Engelhard et al., 2007).

1.3.5. Symptoms of prolonged grief

Symptoms of prolonged grief were assessed with the Inventory of Complicated Grief-Revised (ICG-R; Boelen, van den Bout, de Keijser, & Hoijtink, 2003; Prigerson & Jacobs, 2001). The Dutch version of the ICG-R consists of 29 items measuring prolonged grief symptoms. Participants indicated how often they had experienced these symptoms over the preceding month on a five-point scale ranging from 0 (*almost never*) to 4 (*always*). Studies in subclinical samples of bereaved individuals support the reliability and validity of the ICG-R (Boelen et al., 2003).

1.4. Approach Avoidance Task

1.4.1. Stimuli development

In this investigation, we used previously-developed stimuli (Eisma, Schut, et al., 2014; cf. Gündel et al., 2003). Each stimulus consisted of a picture-word combination. Two picture types were used: a picture of the deceased and one of a stranger. A high-quality picture of the deceased was provided by each participant before the start of the study. For each participant, the picture of the deceased was matched with a picture of a stranger on age, gender and picture type (portrait, standing outside, sitting outside, standing inside, sitting inside). Occasionally, the picture of the deceased was adapted by removing distracting background characteristics or centering the deceased in the middle of the picture.

Next, both pictures were combined with loss words and neutral words. All words were matched on word length and word frequency. Loss words were judged to be more loss-related and more negative than neutral words (Eisma, Schut, et al., 2014). This

matching process resulted in four stimuli types (picture deceased + loss word; picture deceased + neutral word; picture stranger + loss word; picture stranger + neutral word). The crucial stimulus, representing the reality of the loss (which rumination is hypothesized to avoid), was the picture of the deceased combined with a loss word. Other stimuli combinations did not unambiguously remind the participant of the loss (picture deceased + neutral word; picture stranger + loss word), or were not loss-related (picture stranger + neutral word).

For each participant, we combined the 2 picture types with 10 different loss-related words and 10 different neutral words, yielding 40 unique stimuli. Next, all stimuli were produced with the word printed either in white or yellow (word color was the non-relevant cue). We also presented a neutral puzzle picture as a control stimulus, combined with “XXXXXX” instead of a word. Again, we had a version with white X’s and a version with yellow X’s. Sample stimuli are shown in Table 2 and Figs. 1 and 2.

1.4.2. Computer task

To assess implicit approach and avoidance tendencies we used an AAT (Rinck & Becker, 2007). The reliability of the AAT is relatively high for a reaction time task, $\alpha = .70$ (Reinecke, Becker, & Rinck, 2010). In the AAT, participants respond to stimuli presented on a computer screen by pushing a joystick away from themselves or pulling a joystick toward themselves as fast as possible on the basis of a stimulus feature that is unrelated to stimulus content.

In the current study, all stimuli were presented on a computer screen with a 1024 × 768 pixel resolution. The correct response on each trial (pulling or pushing) depended on the non-relevant cue [i.e., word (or X’s) color (yellow or white)]. Participants were instructed to pull stimuli with a white word closer and to push stimuli with a yellow word away. Each of the 40 picture-word combinations was pushed once and pulled once. The puzzle picture was pushed 16 times and pulled 16 times. The total number of trials was therefore 112, preceded by 10 practice trials. All stimuli were presented in a randomized order, with one limitation: no more than 3 stimuli of the same type were presented consecutively. After completing the first half of the trials, participants were allowed to take a short break. A trial was completed if the joystick was moved as far as possible in the correct direction, after which the stimulus would disappear. After the completion of a trial, a new stimulus would appear after bringing the joystick back to the central position and pushing the joystick’s trigger finger button.

The relationship between pulling and pushing and approach and avoidance was made more explicit by a zooming effect. Pulling the joystick made the stimulus bigger, giving the impression that it came closer. Pushing the joystick made the stimulus smaller, suggesting that it was moving away from the participant. In order to achieve this effect, different sizes of each stimulus were created with Photoshop. The biggest picture filled the screen. This picture

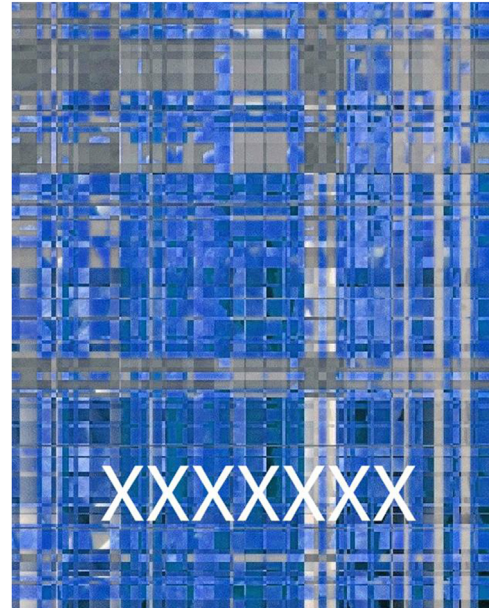
Table 2
Stimulus words (English translation in brackets).

Loss	Neutral
Heengaan (passing away)	Lijntje (line)
Verlies (loss)	Groep (group)
Graf (grave)	Rond (round)
Begrafnis (burial)	Dimensie (dimension)
Dood (death)	Beeld (image)
Sterven (dying)	Termen (terms)
Doodgaan (dying)	Vierkant (cubic)
Overlijden (passing away)	Regelmaat (regularity)
Verloren (lost)	Gebruiken (utilize)
Uitvaart (funeral)	Kantje (side)



Note. The translation of the word 'Dood' is 'Dead'. Pictures of the deceased and pictures of a matched stranger were combined with white and yellow loss-related and neutral words.

Fig. 1. Picture of a stranger with a white loss-related word.



Note. The puzzle picture was presented in combination with white and yellow X's.

Fig. 2. Puzzle picture with X's.

was reduced to 65% of its size six times, giving seven stimulus sizes (100%, 65%, 42%, 27%, 18%, 12%, 7%). Each trial started with the medium-sized picture (27%), and the three larger and smaller versions of this picture would appear after pulling or pushing the joystick, respectively. Back-and-forth movements of the joystick resulted in the corresponding growing and shrinking of the picture.

1.5. Statistical design

Our main analyses consisted of multiple regression analyses, in which rumination levels were used as a predictor of reaction times (push–pull) for each stimulus type (deceased + loss word; deceased + neutral word; stranger + loss word; stranger + neutral word; puzzle + X's). We followed up on significant results by conducting the same multiple regression analyses again, now also controlling for levels of distress, that is, symptom levels of depression, posttraumatic stress disorder, or prolonged grief. All analyses were conducted with two-sided tests. All analyses were conducted with the Statistical Package for the Social Sciences 20.0 (SPSS 20.0).

2. Results

2.1. Preliminary analyses

2.1.1. AAT

Initially, 74 volunteers participated in our study. However, the data of three people were removed before conducting the main analyses, for different reasons. One individual showed cognitive difficulties during the investigation (i.e., memory problems). The AAT reaction times of another participant were not assessed due to a computer error. Finally, one person did not fill out the complete questionnaire.

To reduce the influence of outliers in the dataset, all trials with a reaction time (RT) above 3500 ms were removed (cf. [Fleurkens et al., 2014](#)). Error rates (i.e., pushing when instructed to pull, or

vice versa) were very low in the current sample (2.4% of all trials). Median RT's for all stimuli were calculated for each stimulus type. To be able to test our hypotheses, we also determined *push–pull scores* for each stimulus type, which are calculated by deducting the Median RT's for pull trials from the Median RT's for the push trials. Positive push–pull scores indicated that individuals were slower at pushing than pulling a stimulus, which was interpreted as implicit approach. Negative push–pull scores, on the other hand, were interpreted as implicit avoidance.

2.1.2. Background variables and the AAT

Of all demographic and loss-related variables, only age was significantly related to push–pull scores (cf. [Wolkorte, Kamphuis, & Zijdevind, 2014](#)), and was therefore used as a control variable in our main analyses.

2.2. Main analyses

2.2.1. Regression analyses

Multiple regression analyses were used to examine the association between age and rumination and the push–pull scores for each of the five stimuli (deceased + loss word; deceased + neutral word; stranger + loss word; stranger + neutral word; puzzle + X's). Consistent with our prediction, rumination explained a significant amount of variance over and above age for the push–pull scores for the loss stimulus (i.e., deceased + loss word), $\Delta F(1, 68) = 4.33$, $p = .041$, $\Delta R^2 = .06$, and was associated with stronger implicit avoidance, $b^* = -.24$. Rumination predicted no additional variance in push–pull scores for non-loss-related stimuli, that is, the picture of a stranger with a neutral word, $\Delta F(1, 68) = 0.08$, $p > .20$, $b^* = .03$, $\Delta R^2 = .00$, and the puzzle picture, $\Delta F(1, 68) = 0.51$, $p > .20$, $b^* = .09$, $\Delta R^2 = .01$. Rumination levels were also no significant predictor of push–pull scores for the ambiguous loss-related stimuli, that is, the picture of the deceased with a neutral word, $\Delta F(1, 68) < 0.01$, $p > .20$, $b^* = -.01$, $\Delta R^2 = .00$, and the picture of a stranger with a loss word, $\Delta F(1, 68) = 2.20$, $p = .14$, $b^* = -.18$, $\Delta R^2 = .03$.

To follow up on the significant association between rumination and push–pull scores for loss stimuli, we conducted three additional

multiple regression analyses, now also correcting for current distress levels (i.e., symptoms of depression, posttraumatic stress or prolonged grief). As shown in Table 3, rumination predicted stronger implicit avoidance of the loss, even when controlling for symptoms of depression, $\Delta F(1, 67) = 4.34$, $p = .048$, $b^* = -.30$, $\Delta R^2 = .05$, or symptoms of posttraumatic stress, $\Delta F(1, 67) = 5.83$, $p = .02$, $b^* = -.35$, $\Delta R^2 = .07$. However, the effect of rumination on implicit avoidance was no longer statistically significant after controlling for prolonged grief symptoms, $\Delta F(1, 67) = 2.65$, $p = .11$, $b^* = -.28$, $\Delta R^2 = .03$. In summary, rumination was consistently related to implicit loss avoidance, and only controlling for prolonged grief severity rendered this effect insignificant.

3. Discussion

The present study investigated the associations between rumination and implicit approach and avoidance tendencies after the loss of a first-degree relative. Results indicate that grief rumination was consistently related to implicit avoidance of stimuli that represent the loss. That is, more grief rumination was associated with a larger difference between pull and push trials for pictures of the deceased combined with a loss word. While this effect was maintained after controlling for depressive or posttraumatic stress symptoms, it was no longer statistically significant when controlling for prolonged grief symptoms. Rumination was unrelated to automatic behavior tendencies for ambiguous loss-related stimuli and non-loss-related stimuli.

These findings provide preliminary evidence for an association between rumination and implicit loss avoidance and are in line with the Rumination as Avoidance Hypothesis (RAH; Stroebe et al., 2007). Our results additionally provide more information about the nature of the association between rumination, loss-related distress and different forms of avoidance. For example, in a longitudinal survey study, the prospective associations between rumination and various types of avoidance (e.g., thought suppression, experiential avoidance) were maintained even after controlling for baseline symptom levels of prolonged grief (Eisma et al., 2013; cf. Morina, 2011). Additionally, in an eye-tracking investigation, high ruminators, compared to low ruminators, showed stronger attentional avoidance of loss stimuli on extended presentation times (>1500 ms), even when controlling for symptom levels of depression and prolonged grief (Eisma, Schut, et al., 2014). However, in the current study, the association between rumination and implicit loss avoidance became insignificant after controlling for prolonged grief

symptoms, but not when controlling for symptoms of depression and posttraumatic stress. This may imply that rumination is uniquely associated with explicit avoidance (i.e., self-report, conscious attention), yet not with implicit avoidance (i.e., AAT responding). Should future research corroborate these findings, this may implicate that RAH should be modified. Specifically, instead of assuming that rumination generally serves to avoid the reality of the loss and associated emotions, RAH should state that rumination serves as a strategy to *consciously* avoid painful aspects of loss.

However, a power problem could also underlie the non-significant association between rumination and implicit loss avoidance, after correcting for prolonged grief symptoms. Effect sizes of the relationship between rumination and implicit avoidance were nearly medium in size, also when correcting for symptoms of depression and post-traumatic stress ($\Delta R^2 = .05-.07$). Yet, after controlling for prolonged grief symptoms, this association became weaker ($\Delta R^2 = .03$), and was no longer statistically significant. Although our current sample was too small to test this idea, this could imply that prolonged grief severity partially mediates the effect of rumination on implicit loss avoidance (or vice versa). For future research, we recommend administering multiple measures of rumination and distress and implicit and explicit avoidance in a larger bereaved sample, to further elucidate relationships between these variables.

Putting these results in a broader perspective, it is important to consider possible implications of these (and previous) findings for understanding rumination in other contexts, in particular in post-traumatic stress disorder and stress reactive depression. Bereavement is one of the most stressful life-events that a person can experience, and, similar to trauma-related rumination (Michael et al., 2007), grief rumination is focused on understanding the causes and meaning of a major negative life-event (Eisma, Stroebe, et al., 2014). Therefore, it is conceivable that the nature of the relationship between rumination and event-related avoidance is similar across different populations who have experienced a potentially traumatic life-event, such as a natural disaster, an accident, or extreme violence. In support of this claim, higher levels of rumination in assault survivors were associated with reduced physiological responding (i.e., lower heart rate) when voluntarily recalling a memory of the assault, supporting a link between rumination and event-related emotional suppression (Halligan, Michael, Wilhelm, Clark, & Ehlers, 2006). Given the potential theoretical and clinical implications of an avoidant function of ruminative coping, investigating the link between rumination and automatic and deliberate avoidance of event-related stimuli across different populations is critically important.

This investigation had a number of limitations. First, the sample consisted predominantly of conjugally bereaved women. This may be due to both the relative overrepresentation of women in widowhood and the stronger need of women to talk about their emotional experiences (Stroebe, Stroebe, & Schut, 1999). Although we currently have no reason to believe that the mechanisms under investigation work differently for men, we recommend replication of this research in a sample with more men. Second, the present sample consisted of individuals who were informed before the study that they would be shown pictures of the deceased combined with various words, and yet still decided to participate. It is likely that effects in this study would have been stronger in a sample of bereaved individuals who avoid the loss more consistently. Third, since this study was correlational and cross-sectional, it precludes conclusions about causal effects of rumination on avoidance after loss. In fact, multiple pathways linking rumination and avoidance have been proposed. Some assume that rumination is a cognitive avoidance process (Boelen et al., 2006; Ehlers & Clark, 2000; Eisma et al., 2013; Stroebe et al., 2007), whereas others assume rumination has reciprocal relationships with cognitive avoidance (e.g.,

Table 3
Multiple regression analyses of rumination predicting push–pull scores of loss stimuli (picture deceased + loss word).

Predictors	ΔF	ΔR^2	b^*	p -value
Model 1				
Age	5.90	.08	-.31	.02
Rumination	4.34	.06	-.24	.04
Model 2				
Age	5.90	.08	-.32	.02
Depressive symptoms	0.64	.01	.10	>.20
Rumination	4.06	.05	-.30	.048
Model 3				
Age	5.90	.08	-.32	.02
Post-traumatic stress symptoms	0.11	.00	.18	>.20
Rumination	5.83	.07	-.35	.02
Model 4				
Age	5.90	.08	-.31	.02
Prolonged grief symptoms	1.70	.02	.06	.20
Rumination	2.65	.03	-.28	.11

Note. Push–pull scores are calculated by deducting pull from push trials for a specific stimulus. Negative values indicate stronger avoidance, positive values indicate stronger approach.

Erber & Wegner, 1996; Nolen-Hoeksema et al., 2008). For example, Erber and Wegner (1996) suggested that suppression of negative thoughts leads to rebound effects, which fuel rumination. Nolen-Hoeksema et al. (2008) expanded this idea by arguing that people may want to escape from negative ruminative thoughts by engaging in thought suppression. However, according to Eisma et al. (2013), ruminative thinking could serve as the thought content people use to suppress more threatening cognitions. Clarifying the causal mechanisms that underlie the link between rumination and avoidance is theoretically important, and should be a major goal for future research.

Despite these limitations, the current study adds to a large body of research supporting an association between rumination and cognitive and emotional avoidance (e.g., Cribb et al., 2006; Dickson et al., 2012; Eisma et al., 2013; Giorgio et al., 2010; Kühn et al., 2012; Liverant et al., 2011; Moulds et al., 2007; Wenzlaff & Luxton, 2003) and to a smaller body of research that has explicitly linked rumination with behavioral – as opposed to self-report – measures of avoidance (Eisma, Schut, et al., 2014; Giorgio et al., 2010; Halligan et al., 2006). Moreover, results provided preliminary support for theories of rumination in posttraumatic stress-disorder (Ehlers & Clark, 2000) and grief (Boelen et al., 2006; Stroebe et al., 2007), which state that ruminative coping could serve to avoid reminders of a major negative life-event, possibly in order to avoid event-related aversive emotions.

In addition to these theoretical implications, current findings could also influence clinical practice. Specifically, if future research corroborates and causally extends a link between rumination and avoidance, this would suggest that rumination and emotional distress after bereavement may be reduced through the use of exposure-based techniques. Interestingly, a recent randomized controlled trial supported this idea by showing that written exposure therapy for posttraumatic stress disorder significantly ameliorated rumination (Wisco, Sloan, & Marx, 2013).

Conflict of interest

The authors of this manuscript have no conflict of interest.

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References

- Beekman, A. T. F., Deeg, D. J. H., van Limbeek, J., de Vries, M. Z., & van Tilburg, W. (1997). Criterion validity of the Center for Epidemiologic Studies Depression scale (CES-D): results from a community-based sample of older subjects in the Netherlands. *Psychological Medicine*, 27, 231–235. <http://dx.doi.org/10.1017/S0033291796003510>.
- Boelen, P. A., & van den Bout, J. (2010). Anxious and depressive avoidance and symptoms of prolonged grief, depression and post-traumatic stress disorder. *Psychologica Belgica*, 50, 49–67.
- Boelen, P. A., van den Bout, J., de Keijser, J., & Hoijtink, H. (2003). Reliability and validity of the Dutch version of the Inventory of Traumatic Grief (ITG). *Death Studies*, 27, 227–247. <http://dx.doi.org/10.1080/07481180302889>.
- Boelen, P. A., & van den Hout, M. A. (2008). The role of threatening misinterpretations and avoidance in emotional problems after loss. *Behavioural and Cognitive Psychotherapy*, 36, 71–87. <http://dx.doi.org/10.1017/S1352465807004079>.
- Boelen, P. A., van den Hout, M. A., & van den Bout, J. (2006). A cognitive-behavioral conceptualization of complicated grief. *Clinical Psychology: Science and Practice*, 13, 109–128. <http://dx.doi.org/10.1111/j.1468-2850.2006.00013.x>.
- Boelen, P. A., de Keijser, J., van den Hout, M. A., & van den Bout, J. (2007). Treatment of complicated grief: a comparison between cognitive behaviour therapy and supportive counseling. *Journal of Consulting and Clinical Psychology*, 75, 277–284. <http://dx.doi.org/10.1037/0022-006X.75.2.277>.
- Bonanno, G. A., & Burton, C. L. (2013). Regulatory flexibility: an individual difference perspective on coping and emotion regulation. *Perspectives on Psychological Science*, 8, 591–612. <http://dx.doi.org/10.1177/1745691613504116>.
- Bonanno, G. A., Papa, A., Lalande, K., Zhang, N., & Noll, J. G. (2005). Grief processing and deliberate grief avoidance: a prospective comparison of bereaved spouses and parents in the United States and the People's Republic of China. *Journal of Consulting and Clinical Psychology*, 73, 86–98. <http://dx.doi.org/10.1037/0022-006X.73.1.86>.
- Borkovec, T. D., Ray, W. J., & Stöber, J. (1998). Worry: a cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research*, 22, 561–576.
- Cousijn, J., Goudriaan, A. E., & Wiers, R. W. (2011). Reaching out toward cannabis: approach-bias in heavy cannabis users predicts changes in cannabis use. *Addiction*, 106, 1667–1675. <http://dx.doi.org/10.1111/j.1360-0443.2011.03475.x>.
- Cribb, G., Moulds, M. L., & Carter, S. (2006). Rumination and experiential avoidance in depression. *Behaviour Change*, 23, 165–176. <http://dx.doi.org/10.1375/bech.23.3.165>.
- Dickson, K. S., Ciesla, J. A., & Reilly, L. C. (2012). Rumination, worry, cognitive avoidance and behavioral avoidance: examination of temporal effects. *Behavior Therapy*, 43, 629–640. <http://dx.doi.org/10.1016/j.beth.2011.11.002>.
- DSM-IV-TR. (2000). *Diagnostic and statistical manual of mental disorders, text revision*. American Psychiatric Association.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319–345. [http://dx.doi.org/10.1016/S0005-7967\(99\)00123-0](http://dx.doi.org/10.1016/S0005-7967(99)00123-0).
- Eisma, M. C., Schut, H. A. W., Stroebe, M. S., van den Bout, J., Stroebe, W., & Boelen, P. A. (2014). Is rumination after bereavement linked with loss avoidance? Evidence from eye-tracking. *PLoS One*, 9, e104980. <http://dx.doi.org/10.1371/journal.pone.0104980>.
- Eisma, M., Stroebe, M., Schut, H., Boelen, P., van den Bout, J., & Stroebe, W. (2012). Waarom is dit mij overkomen? Ontwikkeling en validatie van de Utrecht RouwRuminatieSchaa [Why did this happen to me? Development and validation of the Utrecht Grief Rumination Scale]. *Cedragstherapie*, 45, 369–388.
- Eisma, M. C., Stroebe, M. S., Schut, H. A. W., van den Bout, J., Boelen, P. A., & Stroebe, W. (2013). Avoidance processes mediate the relationship between rumination and symptoms of complicated grief and depression following loss. *Journal of Abnormal Psychology*, 122, 961–970. <http://dx.doi.org/10.1037/a0034051>.
- Eisma, M. C., Stroebe, M. S., Schut, H. A. W., van den Bout, J., Boelen, P. A., & Stroebe, W. (2014). Development and psychometric evaluation of the Utrecht Grief Rumination Scale. *Journal of Psychopathology and Behavioral Assessment*, 36, 165–176. <http://dx.doi.org/10.1007/s10862-013-9377-y>.
- Engelhard, I. M., Arntz, A., & van den Hout, M. A. (2007). Low specificity of symptoms in the Post-traumatic stress disorder (PTSD) Symptom Scale: a comparison of individuals with PTSD, individuals with other anxiety disorders and individuals without psychopathology. *British Journal of Clinical Psychology*, 46, 449–456. <http://dx.doi.org/10.1348/014466507X206883>.
- Erber, R., & Wegner, D. M. (1996). Ruminations on the rebound. In R. S. Wyer, Jr. (Ed.), *Advances in social cognition* (Vol. 9, pp. 73–79). Hillsdale, NJ: Erlbaum.
- Fleurkens, P., Rinck, M., & van Minnen, A. (2014). Implicit and explicit avoidance in sexual trauma victims suffering from posttraumatic stress disorder: a pilot study. *European Journal of Psychotraumatology*, 5, 21359. <http://dx.doi.org/10.3402/ejpt.v5.21359>.
- Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report scale to measure posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. *Psychological Assessment*, 9, 445–451. <http://dx.doi.org/10.1037/1040-3590.9.4.445>.
- Freud, S. (1917/1957). Mourning and melancholia. In J. Strachey (Ed.), *Standard edition of the complete works of Sigmund Freud*. London: Hogarth.
- Giorgio, J. M., Sanfilippo, J., Kleiman, E., Reilly, D., Bender, R. E., Wagner, C. A., et al. (2010). An experiential avoidance conceptualization of depressive rumination: three tests of the model. *Behaviour Research and Therapy*, 48, 1021–1031. <http://dx.doi.org/10.1016/j.brat.2010.07.004>.
- Gündel, H., O'Connor, M.-F., Littrell, L., Fort, C., & Lane, R. D. (2003). Functional neuroanatomy of grief: an fMRI study. *American Journal of Psychiatry*, 160, 1946–1953. <http://dx.doi.org/10.1176/appi.apj.160.11.1946>.
- Halligan, S. L., Michael, T., Wilhelm, F. H., Clark, D. M., & Ehlers, A. (2006). Reduced heart rate responding to trauma reliving in trauma survivors with PTSD: correlates and consequences. *Journal of Traumatic Stress*, 19, 721–734. <http://dx.doi.org/10.1002/jts.20167>.
- Heuer, K., Rinck, M., & Becker, E. S. (2007). Avoidance of emotional facial expressions in social anxiety: the approach avoidance task. *Behaviour Research and Therapy*, 45, 2990–3001. <http://dx.doi.org/10.1016/j.brat.2007.08.010>.
- Koster, E. H. W., de Lissnyder, E., Derakshan, N., & de Raedt, R. (2011). Understanding depressive rumination from a cognitive science perspective: the impaired disengagement hypothesis. *Clinical Psychology Review*, 31, 138–145. <http://dx.doi.org/10.1016/j.cpr.2010.08.005>.
- Kühn, S., Vanderhasselt, M.-A., de Raedt, R., & Gallinat, J. (2012). Why ruminators won't stop: the structural and resting state correlations of rumination and its relation to depression. *Journal of Affective Disorders*, 141, 352–360. <http://dx.doi.org/10.1016/j.jad.2012.03.024>.
- Lindemann, E. (1944). Symptomatology and management of acute grief. *American Journal of Psychiatry*, 101, 141–148.
- Liverant, C. L., Kamholz, B. W., Sloan, D. M., & Brown, T. A. (2011). Rumination in clinical depression: a type of emotional suppression? *Cognitive Therapy and Research*, 35, 253–265. <http://dx.doi.org/10.1007/s10608-010-9304-4>.

- Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer (Ed.), *Advances in social cognition*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Michael, T., Halligan, S. L., Clark, D. M., & Ehlers, A. (2007). Rumination in post-traumatic stress disorder. *Depression and Anxiety*, 24, 307–317. <http://dx.doi.org/10.1002/da.20228>.
- Michael, S. T., & Snyder, C. R. (2005). Getting unstuck: the role of hope, finding meaning and rumination in the adjustment to bereavement in college students. *Death Studies*, 29, 435–458. <http://dx.doi.org/10.1080/07481180590932544>.
- Morina, N. (2011). Rumination and avoidance as predictors of prolonged grief, depression and posttraumatic stress in female widowed survivors of war. *Journal of Nervous and Mental Disease*, 199, 921–927. <http://dx.doi.org/10.1097/NMD.0b013e3182392aae>.
- Moulds, M. L., Kandris, E., Starr, S., & Wong, A. C. M. (2007). The relationship between rumination, avoidance and depression in a non-clinical sample. *Behaviour Research and Therapy*, 45, 251–261. <http://dx.doi.org/10.1016/j.brat.2006.03.003>.
- Nolen-Hoeksema, S. (2001). Ruminative coping and adjustment to bereavement. In M. S. Stroebe, R. O. Hansson, W. Stroebe, & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 545–562). Washington DC: American Psychological Association.
- Nolen-Hoeksema, S., & Larson, J. (1999). *Coping with loss*. Marwah, NJ: Erlbaum.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress after a natural disaster: the 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology*, 61, 115–121. <http://dx.doi.org/10.1037//0022-3514.61.1.115>.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3, 400–424. <http://dx.doi.org/10.1111/j.17456924.2008.00088.x>.
- Papa, A., Rummel, C., Garrison-Diehn, C., & Sewell, M. T. (2013). Behavioral activation for pathological grief. *Death Studies*, 37, 913–916. <http://dx.doi.org/10.1080/07481187.2012.692459>.
- Prigerson, H. G., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: a rationale, consensus criteria, and a preliminary empirical test. In M. S. Stroebe, R. O. Hansson, W. Stroebe, & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 613–646). Washington DC: American Psychological Association.
- Querret, D., & Cropley, M. (2013). Assessing treatments used to reduce rumination and/or worry: a systematic review. *Clinical Psychology Review*, 33, 996–1009. <http://dx.doi.org/10.1016/j.cpr.2013.08.004>.
- Radloff, L. S. (1977). The CES-D Scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401. <http://dx.doi.org/10.1177/014662167700100306>.
- Ramsay, R. W. (1977). Behavioral approaches to bereavement. *Behaviour Research and Therapy*, 15, 131–135. [http://dx.doi.org/10.1016/0005-7967\(77\)90097-3](http://dx.doi.org/10.1016/0005-7967(77)90097-3).
- Reinecke, A., Becker, E. S., & Rinck, M. (2010). Three indirect tasks assessing implicit threat associations and behavioral response tendencies test–retest reliability and validity. *Journal of Psychology*, 218, 4–11. <http://dx.doi.org/10.1027/0044-3409/a000002>.
- Rinck, M., & Becker, E. S. (2007). Approach and avoidance in fear of spider. *Journal of Behavior Therapy and Experimental Psychiatry*, 38, 10–120. <http://dx.doi.org/10.1016/j.jbtep.2006.10.001>.
- Shear, M. K., Frank, E., Houck, P. R., & Reynolds, C. F., III (2005). Treatment of complicated grief: a randomized controlled trial. *Journal of the American Medical Association*, 293, 2601–2608. <http://dx.doi.org/10.1001/jama.293.21.2601>.
- Stroebe, M., Boelen, P. A., van den Hout, M., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance: a reinterpretation of its function in adjustment to bereavement. *European Archives of Psychiatry and Clinical Neuroscience*, 257, 462–472. <http://dx.doi.org/10.1007/s00406-007-0746-y>.
- Stroebe, M., & Schut, H. (2010). The Dual Process Model of coping with bereavement: a decade on. *Omega: Journal of Death and Dying*, 61, 273–289. <http://dx.doi.org/10.2190/OM.61.4.b>.
- Stroebe, M., Stroebe, W., & Schut, H. (1999). Gender differences in adjustment to bereavement: an empirical and theoretical review. *Review of General Psychology*, 5, 62–83. <http://dx.doi.org/10.1037/1089-2680.5.1.62>.
- Tait, R., & Silver, R. C. (1989). Coming to terms with major negative life events. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought* (pp. 351–382). New York: Oxford University Press.
- Wagner, B., Knaevelsrud, C., & Maercker, A. (2006). Internet-based cognitive-behavioral therapy for complicated grief: a randomized controlled trial. *Death Studies*, 30, 429–453. <http://dx.doi.org/10.1080/07481180600614385>.
- Wenzlaff, R. M., & Luxton, D. D. (2003). The role of thought suppression in depressive rumination. *Cognitive Therapy and Research*, 27, 293–308.
- Wisco, B. E., Sloan, D. M., & Marx, B. P. (2013). Cognitive emotion regulation and written exposure therapy for posttraumatic stress disorder. *Clinical Psychological Science*, 1. <http://dx.doi.org/10.1177/2167702613486630>, 435–432.
- Wolkorte, R., Kamphuis, J., & Zijdevind, I. (2014). Increased reaction times and reduced response preparation already starts at middle age. *Frontiers in Aging Neuroscience*, 6. <http://dx.doi.org/10.3389/fnagi.2014.00079>. Article 79.