

**RUMINATION FOLLOWING BEREAVEMENT:  
ASSESSMENT, WORKING MECHANISMS AND INTERVENTION**

Maarten C. Eisma

Cover drawing: Huike Thinking, attributed to: Shi Ke © Tokyo National Museum  
Huike says to Bodhidharma: "My mind is anxious, please pacify it."

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# **RUMINATION FOLLOWING BEREAVEMENT: ASSESSMENT, WORKING MECHANISMS AND INTERVENTION**

Ruminatie na een overlijden:  
Meting, werkzame mechanismen en interventie  
(met een samenvatting in het Nederlands)

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*"Don't worry, be happy."*

- Bobby McFerrin



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**General introduction**

# Chapter 1



*"Parting is all we know of heaven, and all we need of hell."*

- Emily Dickinson

The death of a loved one can be a stressful and emotionally overwhelming experience. While most people gradually adjust to this major negative life-event over time, a minority of individuals experience severe physical and mental health problems (for a review: Stroebe, Schut, & Stroebe, 2007a). Losing a significant other is associated with physical disability and pain, weight loss, excessive alcohol use, and an increased odds of hospitalization and even death, which is popularly known as 'dying of a broken heart'. Mental health consequences include heightened general distress, the development of psychiatric disorders such as depression and posttraumatic stress disorder and persistent grief reactions. In fact, several groups of researchers have aimed to define a psychiatric disorder that is characterized by chronic grief responses (Horowitz et al., 1997; Maercker et al., 2013; Prigerson et al., 2009). An influential proposal on defining such complicated grief is prolonged grief disorder (Prigerson et al., 2009). Prolonged grief disorder is characterized by persistent separation distress, difficulty accepting the loss and adjusting to its consequences, present to a distressing and disabling degree at least six months after the death occurred.

Given the strong individual variation in the outcomes of bereavement, it is crucial to identify malleable coping strategies that contribute to the development and persistence of mental health problems after loss, so these can be targeted during interventions. One such phenomenon that has gained considerable attention by researchers in the field of clinical psychology, is repetitive thought, which is defined as the process of thinking attentively, repetitively or frequently about one's self and one's world (Segerstrom, Stanton, Alden, & Shortridge, 2003; for reviews: Querstret & Copley, 2013; Watkins, 2008). Given the potential clinical relevance of knowledge about repetitive thought, it is important to clarify what types of repetitive thinking bereaved persons commonly engage in.

One of the earliest clinical accounts on this topic, was provided by Freud (1917/1957), who observed that bereaved people often think recurrently about the deceased person, the loss and the changed world in which they now live. He believed that this thought process was part of "grief work", an adaptive process whereby people repeatedly confront themselves with the loss, in order to gradually come to terms with this negative life-event. Interestingly, a similar thought process, namely rumination, that is, repetitive and recurrent, self-focused negative thinking about past negative experiences and/or negative mood (Michael, Halligan, Ehlers, & Clark, 2007), has recently

been receiving increasing attention. However, current observations of clinicians on rumination after bereavement, are considerably more specific with regard to the content of repetitive thought than Freud was, and provide a contrasting view on its effects.

For example, in a cognitive-behavioral model of complicated grief, Boelen, van den Hout and van den Bout (2006) argued that many bereaved individuals repeatedly go over the events that led up to the death or try to imagine alternative situations to the reality of the loss. They proposed that chronically engaging in such recurrent thinking serves to avoid painful aspects of the loss, thereby blocking the integration of autobiographical memories about the loss with existing memories, and contributing to complicated grief. In order to get a clear idea of the thought processes that they referred to, it is interesting to consider a literary account of bereavement, which provides a lively example of this phenomenon. The following excerpts (our translation) come from a requiem novel written by the Dutch writer A. F. Th. van der Heijden (2012) about the loss of his son Tonio, who died in a motor vehicle accident in Amsterdam in 2010.

*“Before Tonio had the accident, I had always been amazed about people who kept questioning an ill fate. Instead of adapting to the irreversible, they became whimpering children, who kept asking questions that were already answered. Or to which an answer could not be provided. ‘How in God’s name could this have happened? In God’s name, why? Why? Why?’”*

*“It starts to resemble a compulsion. Continuously I am tracing Tonio’s life, looking for any moment that maybe, without altering his life-path, could have been shortened or lengthened, so that so many years later, on Whit Sunday 2010, Tonio’s bike and the unknown car would have brushed past each other.*

*I find a legion of moments, yet merely remembering these is not enough. They should be accompanied by the sensation of a time-machine: I need to have the visual experience that I have actually returned to an episode of Tonio’s life. I encrypt this very short timeframe (of at most two seconds) so discretely and carefully that seemingly nothing changes in his life-path. All his known later life will not be disordered or impaired.”*

What these excerpts illustrate is that the urge to engage in repetitive thinking after loss can be persistent. It is perhaps not surprising that clinicians were early to observe such thinking in practice (e.g., Freud, 1917/1957, Lindemann, 1944) and still recognize its importance today (Boelen et al., 2006; Stroebe et al., 2007b).

Despite this clinical interest, the first empirical studies on the effects of repetitive thought following bereavement did not appear until the early 1990s. This initial research was focused on examining the effects of depressive rumination, that is, focusing passively and repeatedly on depressive symptoms and feelings and their causes and consequences (Nolen-Hoeksema & Morrow, 1991). For instance, in a longitudinal cohort study of recently bereaved people, depressive rumination was found to predict depressive symptom change over a period of six months (Nolen-Hoeksema, Parker, & Larson, 1994).

Since this ground-breaking research, other bereavement researchers have similarly aimed to elucidate the consequences of repetitive thought after bereavement. Some scientists have researched depressive rumination (e.g., Ito et al., 2003; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema, McBride, & Larson, 1997) whereas others investigated the effects of the loss-related rumination that Van der Heijden (2012) described (e.g., Boelen, van den Bout, & van den Hout, 2003; Boelen & van den Hout, 2008; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; van der Houwen, Stroebe, Schut, Stroebe & van den Bout, 2010).

For example, Ito and colleagues (2003) showed that depressive rumination predicted the occurrence of a depressive episode following child-loss, even when controlling for demographic variables and psychiatric history. Other cross-sectional research showed that bereaved individuals who thought more about the events leading up to the death and why the loss occurred, experienced more symptoms of depression and complicated grief (Boelen et al., 2003; Boelen & van den Hout, 2008). Moreover, thinking repetitively about why the loss occurred and why one experiences loss-related negative feelings, mediated the relationships between potential risk factors of mental disorders (e.g., neuroticism and anxious attachment) and symptom levels of depression and complicated grief in a longitudinal investigation in a large bereaved sample (van der Houwen et al., 2010).

These results support the potential importance of depressive and loss-related rumination in understanding adjustment to loss. As such, ruminative coping appears a promising target for therapeutic intervention in persons experiencing severe loss-related distress. However, in order to effectively reduce rumination through intervention, a clear conceptualization and an understanding of the working mechanisms of rumination is necessary. In the research project described in this dissertation, we therefore aimed to achieve three interrelated goals. A first aim was to define rumination after bereavement and to develop a reliable and valid instrument to assess it. A second aim was to elucidate what potential working mechanisms underlie the maladaptive consequences of rumination after loss. Lastly, based on the knowledge acquired in these previous steps, we set out to develop and test therapeutic interventions that would be likely to ameliorate rumination and complicated grief.

### **Assessment of rumination following bereavement**

As became clear in the previous section, loss-related rumination and depressive rumination are both associated with mental health problems after bereavement. This seems to imply that when studying rumination after bereavement, both rumination about the loss-event and rumination about loss-related emotions should be considered.

This is in line with self-regulation theories about rumination. In an already classic article, Martin and Tesser (1996) characterized rumination as a discrepancy-focused thinking style, aimed at reducing discrepancies between the current state and a desired, but unattained goal. Following this line of reasoning, depressed individuals repeatedly analyse the unclear causes of

their depressed mood, to gain a deeper understanding of the circumstances that led to their negative feelings, in order to lift their mood (Papageorgiou & Wells, 2003). After bereavement, however, most experienced discrepancies are intrinsically linked with the loss. This makes it likely that bereaved persons would think repeatedly about why the loss occurred and the events leading up to the loss, to attempt to understand the loss, and perhaps come to terms with it (Tait & Silver, 1989). Additionally, when ruminating about negative feelings, it would also seem logical that bereaved persons would not only ruminate about their depressed mood, but also about other commonly experienced emotional reactions after loss, such as loneliness or anxiety (cf. Nolen-Hoeksema, 2001).

So, there were both empirical and theoretical arguments to study grief-related rumination, broadly defined as repetitive and recurrent thinking about the causes and consequences of the loss and loss-related negative emotions. However, no validated scale for rumination about a loss-event yet existed. Additionally, although multiple measures had been developed that assess rumination about negative feelings, such as depressed mood (e.g., Conway, Csank, Holm & Blake, 2000; Nolen-Hoeksema & Morrow, 1991), no instrument had yet been developed to assess rumination about *loss-related* emotions. Therefore, a first goal of our project was to create and validate a scale to measure grief-specific rumination.

### **Working mechanisms of rumination following bereavement**

As touched upon briefly, there are differences between conceptualizations of rumination after loss. For instance, Freud (1917/1957) considered repetitive thinking about the deceased and the loss to be part of an adaptive confrontation process, whereas Boelen and colleagues (2006) proposed chronic rumination has adverse consequences because it serves an avoidant function. Although research in bereaved samples has generally supported the idea that rumination contributes to mental health problems instead of alleviating them, the question whether rumination can best be described as a confrontation or avoidance process is a controversial issue.

Until recently, many bereavement researchers considered rumination to be a confrontation process. Most notably, Nolen-Hoeksema, a prominent rumination researcher, characterised rumination as the “polar opposite” to denial and suppression (Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999), and more recently claimed that rumination is not a cognitive avoidance process (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). According to her influential Response Styles Theory (RST), repetitive focus on negative topics through rumination leads to development and persistence of depression, because it: i) increases accessibility of negative thoughts, ii) impairs problem solving, iii) interferes with engagement in instrumental behavior, and iv) decreases the availability of social support (for reviews: Nolen-Hoeksema, 2001; Nolen-Hoeksema et al., 2008).

Other bereavement researchers have similarly, more or less explicitly, suggested rumination after loss is a confrontation process (Bonnano et al., 2005; Michael & Snyder, 2005; Tait & Silver,

1989). For example, Bonanno and colleagues (2005) considered rumination similar to “extensive grief processing” that “exacerbates rather than ameliorates suffering”. In a related vein, theorists outside the field of bereavement have suggested rumination is maladaptive due to a link with excessive focus on negative cognitive material (e.g., Brosschot, Gerin, & Thayer, 2006; Koster, de Lissnyder, Derakshan, & de Raedt, 2011; Martin & Tesser, 1996).

Interestingly, some researchers have recently taken a contrasting view, namely that rumination after bereavement serves an avoidant function, which could explain its maladaptive outcomes (e.g., Boelen et al., 2006; Stroebe et al., 2007). Most notably, in an extensive review of the rumination literature, Stroebe and colleagues (2007) introduced the Rumination as Avoidance Hypothesis (RAH). RAH states that chronic rumination after bereavement serves as a distraction from the most painful aspects of the loss, such as the permanence of separation. This avoidance, in turn, is assumed to interfere with acceptance of the loss (Stroebe et al., 2007; Worden, 2009) and to block integration of autobiographical memories of the loss with existing memories in the autobiographical memory base, thereby contributing to grief complications (Boelen et al., 2006).

When RAH was developed, its evidentiary base mostly consisted of theories and sparse empirical results from other research areas. It was, for instance, partly inspired by investigations of worrying in generalized anxiety disorder (GAD). Borkovec, Ray and Stöber (1998) hypothesized that “worry partly functions as a cognitive avoidance response to threatening stimuli.” For example, since worry is predominantly verbal in nature, chronic worrying could reduce the cognitive accessibility of more emotionally-laden imagery. Another source of inspiration for RAH was a cognitive model of posttraumatic stress disorder (PTSD) by Ehlers and Clark (2000), which held that rumination may be an important cognitive avoidance strategy in posttraumatic stress disorder. It was proposed persistent rumination may interfere with the development of a complete trauma memory, thereby fueling posttraumatic stress disorder, because it is focused on “what if... questions” rather than on the trauma “as it actually happened”.

In summary, whereas researchers have often attributed the maladaptive effects of rumination to a recurrent focus on (or confrontation with) negative cognitive content, others have argued that the adverse consequences of rumination are a result of cognitive avoidance of painful aspects of the loss. Crucially, these contrasting theories yield very different recommendations for clinical practice. That is, the most effective methods to reduce ruminative coping and thereby levels of complicated grief, may depend on whether (and to what extent) rumination is a confrontation or avoidance process. If rumination is a confrontation process, then engaging in new meaningful activities could be an effective therapeutic technique, as this would challenge negative thoughts, increase positive mood, and give people less time to ruminate (Martell, Addis, & Jacobson, 2001; Nolen-Hoeksema et al., 2008). Conversely, if rumination is an avoidance process, then confronting people with the most painful aspects of the loss could be an effective intervention method, as this would counter avoidance tendencies, thereby reducing the need to ruminate (RAH: Stroebe et al., 2007). Examining the function of rumination following bereavement is thus both theoretically and

clinically important: It increases knowledge of coping with loss and provides potential guidelines for clinical intervention for highly distressed bereaved people who chronically ruminate.

Despite the relevance of the topic, the question whether rumination is a confrontation or avoidance process has received scant attention in the scientific literature. While many studies have shown that rumination is linked with sustained attention and memory biases for general negative material (for a review: Koster et al., 2011), few studies have investigated the link between rumination and approach or avoidance of personally-relevant threatening material (e.g., the reality of the loss following bereavement). Nevertheless, surveys in non-bereaved samples generally support positive associations between rumination, cognitive avoidance and experiential avoidance (i.e., avoidance of internal experiences such as memories, thoughts and emotions), and levels of psychopathology (e.g., Cribb, Moulds, & Carter, 2006; Dickson, Ciesla, & Reily, 2012; Giorgio et al., 2010; Wenzlaff & Luxton, 2003). Notably, a rare investigation in a bereaved sample also supported positive relationships between the trait tendency to ruminate, experiential avoidance and symptoms of depression, posttraumatic stress and complicated grief (Morina, 2011). However, since this study was cross-sectional, it did not allow for investigation of potential causal relationships.

In addition to a lack of longitudinal studies, there is a paucity of research which has examined the link between rumination and (implicit) behavioral - as opposed to (explicit) self-report - measures of loss-related approach and avoidance. This is particularly relevant, because people may not always be aware of their avoidance behavior (Coifman, Bonanno, Ray, & Gross, 2007). Investigating the link between rumination and less obtrusive measures of approach and avoidance behavior is therefore a crucial step in establishing the function of ruminative coping after bereavement. Therefore, a second major aim of this project was to clarify the working mechanisms of rumination by investigating the longitudinal relationships between rumination, avoidance and loss-related distress and to shed light on the associations between rumination and behavioral measures of approach and avoidance.

### **Therapeutic intervention for rumination following bereavement**

Different conceptualizations of rumination provide contrasting guidelines for treatment for people experiencing chronic rumination and loss-related distress. If rumination is a confrontation strategy, a plausible intervention would be behavioral activation, that is, encouraging people to gradually engage in more pleasurable and fulfilling activities. However, if rumination is an avoidance strategy, treatment should focus on exposure to avoided material. Exposure after bereavement is characterized by gradually reducing loss-related avoidance behavior, by confronting persons with the most emotionally-laden aspects of their loss, such as the permanence of separation.

At the outset of this project, no systematic research had been conducted that provided support for the effectiveness of either strategy to reduce rumination following bereavement. However, some evidence has been gathered over the past years that suggested that both these therapeutic

techniques may be effective in reducing post-loss distress. Behavioral activation has not frequently been studied in bereaved samples, but therapists have suggested it could be an important add-on element to complicated grief therapy (Shear, Boelen, & Neimeyer, 2011). Furthermore, a recent open pilot trial showed that behavioral activation could be effective as a stand-alone treatment for loss-related distress. Relative to a waiting list group, behavioral activation resulted in large reductions in depression, posttraumatic stress and complicated grief symptoms from pre to post-test (Papa, Sewell, Garisson-Diehn, & Rummel, 2013). Exposure therapy has long been advocated as a potentially effective strategy to alleviate loss-related distress (e.g., Ramsay, 1977). Today, exposure is a core element in many contemporary psychological interventions for complicated grief, the efficacy of which was supported in randomized controlled trials (e.g., Boelen, de Keijsjer, van den Hout, & van den Bout, 2007; Rosner, Pfoh, Kotoučová, & Hagl, 2014; Shear, Frank, Houck & Reynolds, 2005; Wagner, Knaevelsrud, & Maercker, 2006).

In addition, some tentative results indicate that behavioral activation and exposure can be effectively applied to target repetitive thought. For instance, an eclectic rumination-focused treatment for residual depression including behavioral activation techniques, significantly reduced depressive rumination, relative to a waiting-list control group (Watkins et al., 2011). Two case studies further showed that behavioral activation ameliorated rumination in distressed bereaved individuals (Papa, Rummel, Garrison-Diehn, & Sewell, 2013). Lastly, behavioral activation has been found effective in reducing chronic worry, a repetitive thought process similar to rumination (Chen, Liu, Rapee, & Pillay, 2013). A first indication that exposure therapy may be effective in breaking the ruminative cycle was also recently provided: Written exposure for posttraumatic stress disorder significantly reduced rumination in a waiting-list randomized controlled trial (Wisco, Sloan, & Marx, 2013).

Of course, it is unclear how well most of these findings generalize to a bereaved population experiencing elevated levels of rumination and distress. Therefore, further investigation of the potential of behavioral activation and exposure-based techniques to reduce ruminative coping is warranted. Testing the effectiveness of both treatment strategies in ameliorating rumination could serve two important goals: It would elucidate the value of contrasting theories about the nature of rumination, and could also serve as a test of the proposed clinical implications of these theories. A final goal of this research project was therefore to conduct a randomized controlled trial in which the effectiveness of exposure and behavioral activation would be investigated.

## Overview of research aims and chapters

Since there was no psychometrically sound instrument to measure the ruminative thoughts that bereaved persons are likely to engage in, the first major aim of our project was to develop and validate a questionnaire that assesses grief-specific rumination. We defined grief rumination as repetitive and recurrent thinking about the causes and consequences of a loss and loss-related negative feelings. Three investigations were conducted to achieve this aim. One of these was

published in a Dutch peer-reviewed journal (Eisma et al., 2012). Two other studies are reported in this thesis.

In *Chapter 2*, a study is described which deals with the development and international validation of the Utrecht Grief Rumination Scale (UGRS), a new measure to assess grief rumination. Using comparative factor analyses, we examined the cross-cultural equivalence of the factor structure of this new scale with cross-sectional data from 204 English and 316 Dutch recently bereaved persons. Additionally, we investigated the reliability and the divergent, convergent, concurrent and discriminant validity of the UGRS.

In *Chapter 3*, we report on a study which further examined the predictive validity of the UGRS. In a three-wave longitudinal investigation of 242 bereaved individuals, we compared the predictive value of subtypes of grief rumination (as assessed with the subscales of the UGRS) to that of subtypes of depressive rumination, brooding and reflection (Treynor, Gonzalez & Nolen-Hoeksema, 2003), for concurrent and prospective levels of depressive and complicated grief symptoms.

The second major research aim was to elucidate the function of rumination after loss: Can it best be conceptualized as a confrontation or an avoidance process? In order to achieve this second aim, we conducted four interrelated studies, each of which was designed to fill specific gaps in knowledge about this topic.

First, we wanted to examine the longitudinal associations between rumination, avoidance processes and loss-related distress, to explore potential causal mechanisms that may explain the maladaptive effects of rumination. In *Chapter 4*, we first put forward three competing hypotheses on how avoidance potentially links rumination and mental health problems following bereavement. Next, we describe how we tested these competing hypotheses in a sample of 282 recently bereaved individuals, using a multiple mediation design in a three-wave longitudinal survey study.

Second, we set out to investigate the associations of rumination with less obtrusive (i.e., non-self-report) measures of approach and avoidance tendencies, to answer the question whether ruminative coping is linked with approach or avoidance of the reality of the loss. Two laboratory studies were conducted to achieve this goal.

In *Chapter 5*, an eye-tracking study is described, in which we examined the short and long-term attention patterns of 54 bereaved individuals (high and low ruminators) for various stimuli types, including loss-related, negative and neutral stimuli. Since eye-tracking can be used to assess attention patterns in detail, this method allowed us to study unconscious and conscious attention for different stimuli types. Among other things, we predicted that high ruminators, compared to low ruminators, would consciously avoid looking at loss stimuli, and would instead focus their gaze on general non-loss-related negative stimuli.

In *Chapter 6*, we examined implicit approach and avoidance behavior of 74 bereaved persons using an Approach Avoidance Task (Rinck & Becker, 2007). During the Approach Avoidance

Task, participants pushed and pulled loss-related and neutral stimuli towards or away from themselves as fast as possible on the basis of an irrelevant stimulus feature. We expected that higher rumination would be associated with faster pushing and slower pulling of loss stimuli, that is, with stronger implicit avoidance of the loss.

Third, as a final test of the function of rumination and also of the potential clinical implications of our research project, we set out to investigate which therapeutic technique was effective in reducing chronic rumination and loss-related distress: Behavioral activation or exposure. In *Chapter 7*, we describe a brief internet-based guided randomized waiting list controlled trial of exposure and behavioral activation in a group of 47 bereaved persons with elevated levels of rumination and complicated grief.

Finally, in *Chapter 8*, we conclude with a summary of the findings of the studies described in this thesis, their theoretical and clinical implications and directions for future research.

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**Assessment**

**PART 1**



# Chapter 2

## Development and Psychometric Evaluation of the Utrecht Grief Rumination Scale

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## **ABSTRACT**

*Objectives:* Two different types of ruminative coping, depressive rumination and grief rumination, negatively influence bereavement outcome. Although grief-specific rumination is likely to be relevant in the bereavement context, no internationally validated scale to measure grief rumination exists. Therefore, the current contribution aims to validate the Utrecht Grief Rumination Scale (UGRS), a scale developed to measure grief-specific rumination, in an English sample. Psychometric properties of the English UGRS were compared with those in a Dutch sample.

*Methods:* 204 British adults (89% women, 11% men), bereaved on average 16 months ago, and 316 Dutch adults (88% women, 12% men), bereaved on average 12 months ago, filled out online questionnaires. Different types of rumination (grief rumination, brooding, reflection, trait rumination) and symptoms of psychopathology (anxiety, depression, complicated grief) were measured.

*Results:* A correlated five factor model provided the best fit for the UGRS. Multi-group comparisons showed that the factor structures of the English and Dutch version of the UGRS were highly similar across language groups. The UGRS showed excellent reliability. Results further supported the construct, convergent, divergent and concurrent validity of the English UGRS. The psychometric properties of the Dutch UGRS corroborated these findings.

*Conclusions:* The UGRS appears a valid instrument to assess grief-specific rumination in international research and may have potential applicability as a clinical instrument to assess rumination in individuals with problematic grief.

Repetitive thought has been a core tenant of theories on adjustment to bereavement for nearly a century. As early as 1917, Freud observed that bereaved individuals often think recurrently about the deceased person, the loss experience and the changed world in which they now live (Freud, 1917/1957). He believed this thought process to be a crucial component of grief work, an adaptive process whereby individuals gradually come to terms with a loss by repeatedly confronting themselves with this life-changing event. This idea has echoed through bereavement literature since that time (Bowlby, 1980; Lindemann, 1944; Stroebe, 1992).

Recently, however, increasing attention has been devoted to a maladaptive thought process after the death of a loved one, rumination. Rumination is broadly defined as repetitive and recurrent, self-focused negative thinking about past negative experiences and/or negative mood (Michael, Halligan, Ehlers, & Clark, 2007). Two different types of ruminative thinking, depressive rumination and grief rumination, have been proposed as playing an important role in the development and persistence of depression (Nolen-Hoeksema, 2001) and complicated grief (Boelen, van den Hout, & van den Bout, 2006).

First, depressive rumination, repetitively and passively focusing on depressive symptoms and on the possible causes and consequences of these symptoms (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), may be a risk factor after loss. Depressive rumination has been proposed to be maladaptive, because it increases accessibility of negative thoughts and memories, impairs problem solving, interferes with instrumental behavior, and drives away social support (for a review: Nolen-Hoeksema 2001). Indeed, it is associated with, and prospectively predicts depressive symptoms following bereavement (e.g., Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Parker, & Larson, 1994).

While depressive rumination may thus play a role in the aftermath of a loss, a related, but fundamentally different phenomenon, namely grief rumination, has also been linked to negative consequences after the loss of a significant other. Grief rumination has been characterized as repetitive and recurrent thinking about the loss, its consequences and/or negative emotions related to the loss (Boelen, van den Bout, & van den Hout, 2003; Boelen et al. 2006; Boelen & van den Hout 2008; van der Houwen et al., 2010). Thus, whereas depressive rumination is focused exclusively on depressive feelings and symptoms, grief rumination consists primarily of thoughts about the reasons for and meaning of the loss and general loss-related emotions. Previous research has shown that grief rumination is related to severity of depressive and complicated grief symptoms (Boelen et al., 2003; Boelen & van den Hout, 2008). Moreover, the relationship between personality characteristics of recently bereaved individuals, such as neuroticism and attachment style, and symptoms of depression and complicated grief, were found to be mediated by grief rumination in a longitudinal study (van der Houwen et al., 2010). While these findings underline the importance of grief-specific ruminative thought in determining the consequences of the loss of a loved one, no reliable and valid measure of grief rumination has yet been developed for international scientific research.

This is surprising, because there are compelling theoretical reasons why grief rumination is different from and more likely to occur after a loss-experience, than depressive rumination. First, the emotions bereaved individuals ruminate about are likely to include more than just depressive emotions. Although sadness is a common reaction to the death of a significant other, and a depressive disorder can develop as a consequence of bereavement, mourners commonly report many different emotional experiences, such as dysphoria, anger and anxiety (for a review: Stroebe, Schut & Stroebe, 2007), all of which can be the focus of rumination (Robinson & Alloy, 2003; Sukhodolski, Golub, & Cromwell, 2001). Therefore, ruminative thinking after bereavement is likely to be focused on general loss-related negative feelings rather than exclusively on depressive emotions (cf. Nolen-Hoeksema, 2001).

The second reason why grief rumination is more likely to occur after a loss-experience than depressive rumination, is that a loss logically induces different types of ruminative thoughts than a dysphoric or depressive episode unprecedented by a loss. Rumination has been characterized as a discrepancy-focused thinking style, which revolves around a common instrumental theme (Martin & Tesser, 1996). Depressed individuals frequently report that they ruminate to try to understand their depressive feelings (Papageorgiou & Wells, 2003) and frequently-used measures of depressive rumination, such as the Ruminative Response Scale, or RRS (Nolen-Hoeksema & Morrow, 1991; Treynor, Gonzalez, & Nolen-Hoeksema, 2003) largely consist of items that measure thoughts about possible, but unclear causes of these feelings. Thus, in response to a discrepancy in mood state (one feels depressed when one wants to feel happy) a depressed ruminator repeatedly analyzes the ambiguous precedents of his current low mood. However, the source of negative feelings is less equivocal after a loss; negative emotions experienced by bereaved individuals are often intrinsically linked with the death of a loved one. Therefore, a bereaved person may attempt to resolve a discrepancy in mood state and make sense of what has happened by recurrently thinking about the causes and consequences of the death (Tait & Silver, 1989). Similar to trauma-related rumination (Michael et al., 2007) then, rumination following loss is focused more strongly on the life-changing event (i.e. the death of a loved one), than on the unclear causes of depressive feelings and symptoms.

Since there are both theoretical and empirical arguments for continued investigation of the effects and correlates of grief-specific rumination, the primary goal in this study was to validate a new English version the Utrecht Grief Rumination Scale (UGRS), a recently developed instrument to assess different facets of ruminative thinking after bereavement. To accomplish this goal, the psychometric properties of UGRS in an English sample were compared with those of the UGRS in a Dutch sample, in order to investigate the comparability of both measures. We thereby aimed at corroborating and extending the results of a preliminary study which examined the psychometric properties of the Dutch UGRS (Eisma et al., 2012).

In the above mentioned study, the construction of the UGRS was accomplished in two steps. First, 30 items were constructed on the basis of literature on depressive rumination (Nolen-

Hoeksema & Morrow 1991; Treynor et al., 2003), trauma-relevant rumination (Michael et al., 2007) and grief-relevant rumination (e.g., Boelen et al., 2003; Boelen et al., 2006; Boelen & van den Hout, 2008; van der Houwen et al., 2010), as well as semi-structured interviews with bereaved individuals and clinical observations of professional grief therapists. These 30 items were designed to tap five themes of grief-specific ruminative thought: analysis of (emotional) reactions to the loss (cf. Nolen-Hoeksema, 2001; Treynor et al., 2003; van der Houwen et al., 2010), thoughts about the consequences of these reactions (cf. Nolen-Hoeksema, 2001; Nolen-Hoeksema & Morrow, 1991), thoughts about the injustice of the death (including “why questions”) (cf. Boelen et al., 2006; Michael et al., 2007; van der Houwen et al., 2010), thoughts about the meaning and consequences of the loss, including the reactions of others (cf. Michael & Snyder, 2005) and counterfactual thinking about the loss (cf. Boelen et al., 2006; Michael et al., 2007).

Second, the 30-item UGRS was completed by a sample of 302 recently bereaved Dutch individuals. Using principal component analysis (PCA) a correlated five factor solution was found to best explain the scores on the 30-item UGRS. Next, the three highest loading items on each factor were retained, which resulted in a final 15-item scale. Finally, a second PCA showed that scores on each of the five subscales all loaded high on a single factor, suggesting that the UGRS may have a hierarchical factor structure. Analyses further demonstrated that the final UGRS exhibited good internal consistency and adequate temporal stability. Convergent and divergent validity was supported by strong positive associations between the UGRS and maladaptive types of ruminative thinking, such as brooding, and weaker relationships with potentially adaptive types of ruminative thinking, such as reflection (Treynor et al., 2003). In support of the discriminant validity, the UGRS could distinguish groups who generally report more severe grief trajectories, such as people who experienced a sudden loss or child loss, from people with less severe grief trajectories. Predictive validity of the UGRS was also supported: in a group of bereaved individuals with initial high complicated grief symptoms, grief rumination was a better predictor of depressive and complicated grief symptom change, when compared to brooding, reflection and rumination measured with the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999).

In order to establish the psychometric properties of the English UGRS, we first examined the construct validity by conducting factor analyses of the UGRS in the English sample and a new Dutch sample. Specifically, we compared the fit of a one order factor structure with five correlated factors with the fit of a two order factor structure with five sub-factors and one overarching higher-order factor. Next, we investigated the cross-cultural equivalence of the English and Dutch version of UGRS by conducting multi-group confirmatory factor analyses on the factor model that provided the best fit. Consequently, four types of validity were assessed by testing identical hypotheses in both samples. First, with respect to convergent validity, moderate to large positive correlations were expected between grief rumination and maladaptive types of ruminative thinking, such as brooding (Treynor et al., 2003). Second, with respect to the divergent validity, we predicted associations between grief rumination and adaptive types of ruminative

thought (i.e. reflection) would be smaller than those between grief rumination and maladaptive types of ruminative thought (i.e. brooding). Third, with regard to the discriminant validity, grief rumination was hypothesized to distinguish groups that commonly experience more mental health problems after the death of a loved one, such as people who have experienced the death of a child, from groups with less severe grief trajectories, such as people who lost a parent (Stroebe et al., 2007). Fourth, we expected the UGRS to show concurrent validity, that is, grief rumination was hypothesized to predict symptoms of psychopathology over and above sociodemographic and loss-related variables and other types of ruminative thinking, such as brooding and reflection (Treyner et al., 2003) and trait rumination measured with the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999).

## METHODS

### Samples

In both samples, only people who had lost a first-degree relative in the past three years were included, to ensure that the participant groups experienced a wide range of symptom and rumination levels. The English sample consisted of 204 British adults (11% male, 89% female), bereaved on average 16 months ago, with a mean age of 48.5 (SD = 13.0). The majority of the English participants had lost a partner or parent (80%), due to natural causes (84%) and had experienced the loss as unexpected (57%). The Dutch sample was comprised of 316 adults (12% male, 88% female), bereaved on average 12 months ago and a mean age of 48.3 (SD = 11.9). Dutch participants had predominantly lost a partner or parent (81%), due to natural causes (88%) and had experienced the loss as unexpected (47%). Language groups differed on education level,  $\chi^2(3) = 26.76, p < .01, \omega^2 = 0.23$ , and on the relationship with the deceased,  $\chi^2(3) = 11.63, p < .01, \omega^2 = 0.15$ . In the English sample, significantly more people indicated secondary school as their highest education and fewer people indicated vocational school was their highest education, when compared to the Dutch sample (i.e., 35% vs. 27% and 18% vs. 34%). However, this may be due to differences in the school systems of these countries. In the English sample more participants had lost a parent and fewer participants had lost a partner, in comparison to the Dutch sample (i.e., 42% vs. 30% and 38% vs. 51%).

As can be seen in Table 1, scores on rumination and symptoms of psychopathology were higher in the English sample, relative to the Dutch sample, but effect sizes of these differences were small to moderate. These group differences may, in part, be due to the flexible, internet-based recruitment procedure used in this study.

**Table 1** Means, standard deviations and *t*-tests of differences on measures of rumination and symptoms in the English and Dutch sample

| Scale           | English  |           | Dutch    |           | <i>t</i> -value | 95% CI |       | Cohen's <i>d</i> |
|-----------------|----------|-----------|----------|-----------|-----------------|--------|-------|------------------|
|                 | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |                 | LL     | UL    |                  |
| UGRS            | 49.4     | 13.6      | 44.3     | 11.7      | 5.10**          | 3.14   | 7.06  | 0.45             |
| RRS Brooding    | 12.4     | 3.7       | 10.2     | 3.3       | 7.07**          | 1.58   | 2.81  | 0.60             |
| RRS Reflection  | 11.3     | 3.6       | 10.2     | 3.3       | 3.53**          | 0.48   | 1.71  | 0.30             |
| RRQ Rumination  | 41.9     | 7.3       | -        | -         | -               | -      | -     | -                |
| HADS Anxiety    | 12.3     | 4.8       | 10.1     | 4.2       | 5.51**          | 1.41   | 2.98  | 0.48             |
| HADS Depression | 10.7     | 5.3       | 9.8      | 4.9       | 1.98*           | 0.01   | 1.79  | 0.17             |
| ICG             | 67.2     | 26.9      | 55.4     | 23.2      | 5.31**          | 7.43   | 16.16 | 0.47             |

Note. UGRS = Utrecht Grief Rumination Scale, RRS = Ruminative Response Scale, RRQ = Rumination Reflection Questionnaire, HADS = Hospital Anxiety and Depression Scale, ICG = Inventory of Complicated Grief. LL = lower limit; UL = upper limit. The RRQ was only administered in the English sample. \* = significant difference at  $p < 0.05$ . \*\* = significant difference at  $p < 0.01$

### Procedure and measures

All participants were recruited over the internet through announcements on websites for online support groups for bereaved individuals or advertisements on the content network of Google in both the United Kingdom and the Netherlands. Interested individuals linked through to a (bilingual) website specifically designed for the current research project, where information was provided about the study. In line with Dutch regulations for scientific research (Ministerie van Volksgezondheid, Welzijn en Sport, 2002), people who were interested in participation could access an online questionnaire after reading the research information (e.g., on study goals, confidentiality, advantages and disadvantages of study participation) and giving informed consent.

**Sociodemographic information.** Characteristics of the participant (age, sex and education level) and characteristics of the deceased and the loss (relationship with deceased, time since the loss, cause of death and expectations about the death) were measured with a self-constructed questionnaire.

**Grief rumination.** The Utrecht Grief Rumination Scale (UGRS) was used to measure grief-specific rumination, defined as recurrent, repetitive and self-focused thoughts about the causes and consequences of the loss and related negative feelings (Eisma et al., 2012). It consists of five subscales of three items each. Participants could indicate how frequently they had experienced certain types of thinking in the past month on a five-point scale ranging from 1 (never) to 5 (very often). The subscale *Reactions* measures thoughts about negative (emotional) reactions to the loss. An example: "(How often in the past month...) did you try to analyze your feelings about this loss precisely?" The subscale *Injustice* assesses thoughts about the unfairness of the death. An example item is: "(How often in the past month...) did you wonder why this had to happen to you and not someone else?" The subscale *Counterfactuals* measures counterfactual thoughts about the events leading up to the death. For example: "(How often in the past month...) did you

analyze if you could have prevented the death?" The subscale *Meaning* assesses thoughts about the meaning and consequences of the loss experience. An example item is: "(How often in the past month...) did you analyze what the personal meaning of the loss is for you?" The subscale *Relationships* measures thoughts related to social support. For example: "(How often in the past month...) did you think about how you would like others to react to your loss?"

The original Dutch UGRS was translated into English by an independent native speaker and then back-translated into Dutch by another independent person fluent in both Dutch and English. Next, the original version was compared to the back-translated version. Only minor differences existed between these versions and they were addressed by making appropriate adjustments to the English version. The final versions of both scales are added as an appendix.

**Depressive rumination.** The Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991; Dutch translation by Raes, Hermans, & Eelen, 2009) was used to assess depressive rumination. In the current study, two 5-item subscales of the RRS that show no overlap with depressive symptoms, the 'brooding' and 'reflection' subscale, were used (Treyner et al. 2003). Respondents were asked to indicate how often they exhibit certain behavior if they feel sad, blue or depressed on a four-point scale, ranging from almost 1 (*never*) to 4 (*almost always*). An example item of the brooding scale is: "I think: Why do I always react this way?" An example item of the reflection subscale is: "I analyze recent events to understand why I feel depressed." In both the English and the Dutch sample the reliability of the brooding,  $\alpha = .78$  /  $\alpha = .76$ , and reflection subscale,  $\alpha = .78$  /  $\alpha = .78$ , was adequate.

**Rumination.** In order to further evaluate the convergent validity of the UGRS in the English sample a second measure of (trait) ruminative thought was included: the rumination subscale of the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999). The questionnaire consists of twelve statements for which a participant indicates to what extent these are applicable to them on a five-point Likert scale. An example: "I often reflect on episodes in my life I should no longer concern myself with." The internal consistency of the rumination subscale was good,  $\alpha = .86$ .

**Symptoms of anxiety and depression.** Symptoms of anxiety and depression were measured with the Hospital Anxiety and Depression Scale, or HADS (Zigmond & Snaith, 1983) The HADS has been shown to be both a reliable and valid measure of depressive and anxious symptoms in several large Dutch samples, including community samples (Spinhoven et al., 1997). The HADS consists of 14 statements about experiences, of which seven statements tap anxious and seven depressive symptoms. Participants indicated how often or to what extent they have had these experiences in the past week on four-point Likert scales. In both the English sample and the Dutch sample the internal consistency of the anxiety,  $\alpha = .86$  /  $\alpha = .86$ , and the depression subscales,  $\alpha = .88$  /  $\alpha = .89$ , was good.

**Symptoms of complicated grief.** Grief complications were measured with the Inventory of Complicated Grief Revised, or ICG-R (Prigerson & Jacobs, 2001; Dutch translation by Boelen, van den Bout, de Keijser, & Hoijtink, 2003). The Dutch version consists of 29 and the English version

consists of 30 statements about the frequency and intensity of symptoms of complicated grief. Answers are given on a five-point Likert scale ranging from 0 (*almost never*) to 4 (*always*). The internal consistency of the ICG was excellent in both the English,  $\alpha = .96$ , and the Dutch sample,  $\alpha = .95$ .

## RESULTS

### Preliminary analyses

Before conducting confirmatory factor analyses, the multivariate normality of the data on the UGRS was assessed for both samples on the basis of histograms, QQ-plots and measures of skewness and kurtosis. In the English sample, as for the Dutch, multivariate normality was not violated.

### Confirmatory factor analyses

On the basis of principal component analyses in a previous study (Eisma et al., 2012) it was expected that a model with five latent variables (Reactions, Injustice, Counterfactuals, Meaning, Relationships) could best explain the scores on the UGRS in the English sample, and that these findings would be substantiated in the Dutch sample. Moreover, a two-order factor model was considered to be an appropriate solution for the UGRS, since all five factors loaded highly on a single factor (Grief Rumination) in the same study.

The factor structure of both versions of the UGRS was examined through structural equation modeling (AMOS 16.0) using maximum likelihood estimation (Kline, 2005). The one order model was tested first. It was hypothesized that three items each would load on each of the five latent variables. The loading of a single item on each factor was constrained to 1.0 to establish a metric for the latent factors. All other factor loadings were freely estimated. Because the subscales measure related types of ruminative thought, factors were assumed to correlate. In a next step, the two-order model was tested. In the two-order model the loading of one of the five factors on the higher order factor was constrained to 1.0. Factors were not allowed to correlate. Other model specifications remained the same.

To examine goodness of fit of the one and two order model the  $\chi^2$ , a statistic that indicates if a pattern of covariation can be explained by the proposed factor structure, was calculated in each sample. However, because the  $\chi^2$  is sensitive to sample size, four other indices were calculated as well: (i) the Comparative Fit Index (CFI), (ii) the Tucker-Lewis Index (iii) the Root Mean Square Error of Approximation (RMSEA) and (iv) the Akaike Information Criterion (AIC). Although there is currently little consensus on adequate cut-off scores for fit indices, conventional values are used in this study. CFI and TLI values above 0.90 (Hu & Bentler, 1999) and values for the RMSEA equal or lower than 0.08 (Browne & Cudeck, 1993) are considered to indicate acceptable model fit. The AIC

is a measure of relative fit that will be used to compare non-nested models. The model with the lowest AIC value provides the best fit for the data.

The results of the analyses can be found in Table 2. As can be seen, the correlated one order model (Figure 1 and 2) provided the best fit of the data on the UGRS in the English sample. Notably, the hierarchical model also showed an appropriate fit on (nearly) all fit indices in the English sample. These findings were corroborated in the Dutch sample, in which the UGRS showed an acceptable model fit for the one order model and the two order model.

**Table 2** *Confirmatory factor analyses of the English and Dutch Utrecht Grief Rumination Scale: overall model fit and multi group comparisons*

| Model   | Model fit indices |        |      |      |       | Model comparison tests |             |        |
|---|-------------------|--------|------|------|-------|------------------------|-------------|--------|
|   | $\chi^2$          | AIC    | CFI  | TLI  | RMSEA | $\Delta \chi^2$        | $\Delta df$ | $p(d)$ |
| English UGRS  |                   |        |      |      |       |                        |             |        |
| 1. One order model with correlated factors                        | 192.11            | 272.12 | 0.94 | 0.92 | 0.08  |                        |             |        |
| 2. Two order model  | 223.76            | 293.76 | 0.92 | 0.90 | 0.09  |                        |             |        |
| Dutch UGRS  |                   |        |      |      |       |                        |             |        |
| 1. One order model with correlated factors                        | 237.30            | 317.30 | 0.93 | 0.91 | 0.08  |                        |             |        |
| 2. Two order model  | 266.73            | 336.73 | 0.92 | 0.90 | 0.08  |                        |             |        |
| Multi group comparisons (one order model with correlated factors) |                   |        |      |      |       |                        |             |        |
| Model 1. Unconstrained model                                      | 448.45            | 608.45 | 0.93 | 0.91 | 0.06  |                        |             |        |
| Model 2. Equal factor loadings                                    | 464.87            | 604.90 | 0.93 | 0.91 | 0.06  |                        |             |        |
| Model 1 versus Model 2  |                   |        |      |      |       | 16.42                  | 10          | 0.09   |
| Model 3. Equal covariances latent variables                       | 482.66            | 592.65 | 0.93 | 0.92 | 0.06  |                        |             |        |
| Model 2 versus Model 3  |                   |        |      |      |       | 17.78                  | 15          | 0.27   |

Note.  $\chi^2$  = Chi Square; AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation. Multi group comparisons were used to test the equivalence of the one order factor structure of the English and Dutch version of the UGRS.

### Multi group comparisons

After conducting separate CFA's for the English and Dutch UGRS, we also tested the cross-cultural equivalence of the UGRS for the one level correlated five factor model, the factor model that provided the best fit. The cross-cultural equivalence was assessed by comparing a model in which the factor loadings and the covariances among the factors were allowed to vary across both language groups (Model 1: Unconstrained model) to a model in which the factor loadings (Model 2: Equal factor loadings) and a model in which the (co)variances among the factors (Model 3: Equal covariances) were constrained to be equal across language groups. To compare the three models, two standard "decrement-to- $\chi^2$ -test" were used to assess if the overall fit of the models differed (Brown, 2006). If a model with more constraints resulted in a significant increase in the overall  $\chi^2$ , indicating a poorer fit, the model with more constraints was rejected in favor of the model with less constraints. Table 2 depicts the results of the multi group comparisons.

First, the unconstrained model (Model 1), which served as a baseline model in the multi group comparisons, was tested. This model produced adequate fit values across both language groups. As before, the  $\chi^2$ -value was significant, but this was disregarded due to the sensitivity of this measure to sample size.

Second, factorial invariance was tested. Factor loadings were constrained to be equal across both samples (Model 2). Fit indices showed that this model also produced a relatively good fit. The difference in  $\chi^2$ -values between Model 1 and Model 2 was not significant, implying that the factor structure of the UGRS was consistent across language groups.

Finally, another set of restrictions was added: (co)variances among the five factors were set to be equal across groups (Model 3). Again, these additional restrictions did not lead to a worse fit, that is, the difference in  $\chi^2$ -values between Model 2 and Model 3 was non-significant. This implies that the associations between the five sub factors were comparable for the English and Dutch versions of the UGRS.

### Reliability

The internal consistency of the total UGRS was excellent in the English sample,  $\alpha = 0.90$ , and this result was substantiated in the Dutch sample,  $\alpha = 0.91$ . All subscales of the English UGRS exhibited adequate to good reliability, with  $\alpha$ 's of 0.84 (Feelings), 0.88 (Injustice), 0.89 (Counterfactuals), 0.84 (Meaning) and 0.74 (Relationships). The reliability of the subscales of the Dutch UGRS was comparable: with  $\alpha$ 's of 0.70 (Feelings), 0.88 (Injustice), 0.90 (Counterfactuals), 0.81 (Meaning) and 0.80 (Relationships). Cronbach's alpha's in the English and Dutch samples were compared using the Alpha test of Hakstian and Whalen (1976). The internal consistencies of the total UGRS and the subscales Injustice, Counterfactuals, Meaning and Relationships did not differ significantly, indicating that these scales show comparable reliability across language groups. However, the Feelings subscale of the English UGRS was more reliable than that of the Dutch version,  $M = 16.68$ ,  $p < .001$ .

The reliability of the English UGRS was further supported by the item-total correlations. All item-total correlations were high for the English UGRS ( $0.54 \geq r \geq 0.76$ ). Furthermore, item scores all correlated positively with the subscales they belonged to. High correlations were found between items and total scores on subscales Reactions ( $0.86 \geq r \geq 0.88$ ), Injustice ( $0.87 \geq r \geq 0.92$ ), Counterfactuals ( $0.89 \geq r \geq 0.92$ ), Meaning ( $0.82 \geq r \geq 0.92$ ) and Relationships ( $0.74 \geq r \geq 0.86$ ). Again, findings were corroborated in the Dutch sample. Item-total correlations were moderate to high for the Dutch UGRS ( $0.49 \geq r \geq 0.72$ ) and high correlations were also found between items and total scores on subscales Reactions ( $0.76 \geq r \geq 0.81$ ), Injustice ( $0.87 \geq r \geq 0.91$ ), Counterfactuals ( $0.87 \geq r \geq 0.94$ ), Meaning ( $0.76 \geq r \geq 0.88$ ) and Relationships ( $0.83 \geq r \geq 0.85$ ). Fisher Z-tests indicated that item-total correlations did not differ between groups.

## Validity

All correlations between the UGRS and its subscales and other measures relevant to the assessment of validity are shown in Table 3. Notably, Fisher Z-tests indicated that correlations in Table 3 did not differ between language groups. The results of the hierarchical multiple regression analyses conducted to examine the concurrent validity of the UGRS can be found in Tables 4 and 5.

**Table 3** Correlations between UGRS en other constructs in the English and Dutch sample.

|                 | Language | RRS<br>Brooding | RRS<br>Reflection | RRQ<br>Rumination | HADS<br>Anxiety | HADS<br>Depression | ICG  |
|-----------------|----------|-----------------|-------------------|-------------------|-----------------|--------------------|------|
| UGRS            | English  | 0.54            | 0.35              | 0.27              | 0.53            | 0.45               | 0.74 |
| Total           | Dutch    | 0.62            | 0.24              | -                 | 0.48            | 0.49               | 0.73 |
| UGRS            | English  | 0.46            | 0.41              | 0.27              | 0.44            | 0.34               | 0.54 |
| Reactions       | Dutch    | 0.33            | 0.43              | -                 | 0.32            | 0.27               | 0.44 |
| UGRS            | English  | 0.53            | 0.15*             | 0.23              | 0.47            | 0.41               | 0.71 |
| Injustice       | Dutch    | 0.60            | 0.04 <i>ns</i>    | -                 | 0.43            | 0.42               | 0.66 |
| UGRS            | English  | 0.30            | 0.22              | 0.11 <i>ns</i>    | 0.39            | 0.31               | 0.52 |
| Counterfactuals | Dutch    | 0.36            | 0.10 <i>ns</i>    | -                 | 0.29            | 0.29               | 0.49 |
| UGRS            | English  | 0.35            | 0.33              | 0.20              | 0.29            | 0.36               | 0.50 |
| Meaning         | Dutch    | 0.23            | 0.18              | -                 | 0.24            | 0.34               | 0.42 |
| UGRS            | English  | 0.35            | 0.27              | 0.22              | 0.37            | 0.26               | 0.44 |
| Relationships   | Dutch    | 0.45            | 0.25              | -                 | 0.35            | 0.37               | 0.48 |

Note. UGRS = Utrecht Grief Rumination Scale; RRS = Ruminative Response Scale; RRQ: Rumination Reflection Questionnaire; HADS = Hospital Anxiety and Depression Scale; ICG = Inventory of Complicated Grief. All correlations are significant at  $p < 0.01$ , unless otherwise specified. \* = significant at  $p < 0.05$ , *ns* = not significant.

**Convergent validity.** As predicted, grief rumination correlated positively with other measures of maladaptive ruminative thought; it showed a strong association with brooding measured by the RRS in the English sample,  $r = 0.54$ . Correlations between the subscales of the UGRS and brooding were all positive and medium to large in size. As predicted, results in the Dutch sample were highly similar. A positive association was also found between grief rumination and trait rumination (RRQ) in the English sample,  $r = 0.27$ . Furthermore, subscales of the English UGRS showed positive linear associations with trait rumination, with the exception of the subscale Counterfactuals.

**Divergent validity.** In support of the divergent validity of the UGRS, the correlation between grief rumination and a potentially adaptive type of repetitive thought, reflection, was found to be lower than the correlation between grief rumination a maladaptive type of repetitive thought, brooding, in the English sample,  $z(200) = 3.17$ ,  $p = .002$ . This result was substantiated and in the Dutch sample,  $z(313) = 7.08$ ,  $p < .001$ . Moreover, in the English sample, as for the Dutch sample, correlations between subscales of the UGRS and reflection were small to moderate.

**Table 4** Predictive value of the UGRS for symptoms of psychopathology in the English sample after controlling for relevant loss-related variables and brooding, reflection and rumination (RRQ).

|                          | Variables                           | R <sup>2</sup> -change | β (final model) |
|--------------------------|-------------------------------------|------------------------|-----------------|
| <i>Anxiety</i>           |                                     |                        |                 |
| Block 1                  | Loss-related variable <sup>1</sup>  | 0.04                   | -               |
| Block 2                  | RRS Brooding                        | 0.38                   | 0.33*           |
|                          | RRS Reflection                      |                        | 0.01            |
|                          | RRQ Rumination                      |                        | 0.17*           |
| Block 3                  | UGRS                                | 0.04                   | 0.26*           |
| <i>Depression</i>        |                                     |                        |                 |
| Block 1                  | RRS Brooding                        | 0.23                   | 0.34*           |
|                          | RRS Reflection                      |                        | 0.03            |
|                          | RRQ Rumination                      |                        | -0.04           |
| Block 2                  | UGRS                                | 0.05                   | 0.26*           |
| <i>Complicated grief</i> |                                     |                        |                 |
| Block 1                  | Loss-related variables <sup>2</sup> | 0.07                   | -               |
| Block 2                  | RRS Brooding                        | 0.35                   | 0.23*           |
|                          | RRS Reflection                      |                        | -0.01           |
|                          | RRQ Rumination                      |                        | 0.16*           |
| Block 3                  | UGRS                                | 0.22                   | 0.58*           |

Note. UGRS = Utrecht Grief Rumination Scale; RRS = Ruminative Response Scale; RRQ = Rumination Reflection Questionnaire. No loss-related or sociodemographic variables contributed to depressive symptoms. For dummy variables no beta-coefficients are reported. <sup>1</sup>sex of the deceased. <sup>2</sup>sex of the deceased and relationship with deceased. \* = significant at  $p < .01$

**Table 5** Predictive value of the UGRS for symptoms of psychopathology in the Dutch sample after controlling for relevant loss-related variables and brooding and reflection.

|                          | Variables                           | R <sup>2</sup> -change | β (final model) |
|--------------------------|-------------------------------------|------------------------|-----------------|
| <i>Anxiety</i>           |                                     |                        |                 |
| Block 1                  | RRS Brooding                        | 0.38                   | 0.50*           |
|                          | RRS Reflection                      |                        | 0.04            |
| Block 2                  | UGRS                                | 0.02                   | 0.16*           |
| <i>Depression</i>        |                                     |                        |                 |
| Block 1                  | Loss-related variables <sup>1</sup> | 0.09                   |                 |
| Block 2                  | RRS Brooding                        | 0.20                   | 0.31*           |
|                          | RRS Reflection                      |                        | -0.02           |
| Block 3                  | UGRS                                | 0.04                   | 0.26*           |
| <i>Complicated grief</i> |                                     |                        |                 |
| Block 1                  | Loss-related variables <sup>2</sup> | 0.14                   |                 |
| Block 2                  | RRS Brooding                        | 0.39                   | 0.39*           |
|                          | RRS Reflection                      |                        | -0.02           |
| Block 3                  | UGRS                                | 0.12                   | 0.45*           |

Note. UGRS = Utrecht Grief Rumination Scale; RRS = Ruminative Response Scale. No loss-related or sociodemographic variables contributed to anxiety symptoms. For dummy variables no beta-coefficients are reported. <sup>1</sup>relationship with the deceased; <sup>2</sup>relationship with the deceased, cause of death, expectedness of death. \* = significant effect at  $p < .01$

**Discriminant validity.** In support of the discriminant validity of the UGRS grief rumination was found to distinguish groups that generally report more mental health problems after the death of a loved one. In the English sample people who had experienced their loss as unexpected on average reported more grief rumination than people who had experienced the death as expected,  $t(188) = -3.32, p = .001, d = 0.48$ . Furthermore, the type of relationship with the deceased was important in determining the level of grief rumination in the English sample,  $F(4, 198) = 3.56, p = .008$ . Specifically, compared to people who had lost a parent, people who had lost a child,  $t(109) = 3.34, p = .001, d = 0.63$ , or a partner,  $t(155) = 2.48, p = .014, d = 0.39$ , reported more ruminative thoughts. Results in the Dutch sample substantiated these findings. Experiencing an unexpected loss was accompanied by higher levels of grief rumination than the experience of an expected loss,  $t(280) = -3.92, p < .001, d = 0.47$ . Relationship with the deceased was also an important factor for the level of grief rumination in the Dutch group,  $F(4, 312) = 5.06, p < .001$ . The parents of a deceased child,  $t(124) = 3.33, p < .001, d = 0.59$ , and widowers and widows,  $t(249) = 4.13, p < .001, d = 0.52$ , ruminated more than people who had lost a parent.

**Concurrent validity.** As can be seen in Tables 4 and 5, the concurrent validity of the UGRS was supported. Grief rumination concurrently predicted symptom levels of anxiety, depression and complicated grief over and above relevant loss-related variables and brooding, reflection and trait rumination in the English sample. Moreover, the UGRS predicted significant amounts of additional variance in anxious (4%), depressive (5%) and complicated grief symptoms (22%). Grief rumination was a better predictor than other types of ruminative thought for symptoms of complicated grief: the Beta of the UGRS,  $\beta = 0.58, p < .001$ , is much higher than that of brooding,  $\beta = 0.23, p < .001$ , reflection,  $\beta = -0.01, p > .10$ , and rumination measured with the RRQ,  $\beta = 0.16, p = .002$ . In the Dutch sample these results were corroborated. Grief rumination predicted symptoms of anxiety, depression and complicated grief over and above relevant loss-related variables, brooding and reflection. Grief rumination was also found to be a significant predictor for anxious, depressive and complicated grief symptoms, explaining 2%, 4% and 12% additional variance, respectively. Again, grief rumination,  $\beta = 0.45, p < .001$ , was a better predictor of complicated grief symptoms than brooding,  $\beta = 0.39, p < .001$ , and reflection,  $\beta = -0.02, p > .10$ .

## DISCUSSION

The primary goal of this study was to develop and validate the English version of Utrecht Grief Rumination Scale (UGRS), a self-report scale to measure grief-specific ruminative thought. Concurrently, the psychometric properties of the Dutch version of the UGRS were investigated further. For the English version of the UGRS, as for the Dutch version, confirmatory factor analysis (CFA) showed that a five factor model with five correlated factors (Reactions, Injustice, Counterfactuals, Meaning, Relationships) provided the best fit, when compared to a hierarchical model. An important finding was that a five factor model with one higher-order common factor

did not provide the *best* fit, but the fit was nearly identical to that of the one order model. This supported the claim that the UGRS is a general measure of grief-specific ruminative thought.

Furthermore, multi group comparisons showed that the factor structure of the UGRS was highly similar across both language groups. The model in which the factor loadings and the covariance structures of English and Dutch UGRS were constrained to be equal produced an acceptable fit. Overall, the series of confirmatory factor analyses supported the construct validity and cross-cultural equivalence of the UGRS in the English and Dutch groups.

The reliability of the UGRS subscales and the total UGRS were also supported and were comparable in both samples. Moreover, earlier preliminary findings on the convergent, divergent, discriminant and concurrent validity of the UGRS (Eisma et al., 2012) were corroborated. All in all, the English and Dutch UGRS showed good psychometric properties.

The reported relationships of grief rumination with other types of repetitive thought and symptoms of psychopathology were highly comparable for the English and Dutch samples. The results showed that grief rumination may best be conceptualized as a maladaptive type of repetitive thinking, because it was more strongly associated with maladaptive components of depressive rumination (i.e., brooding) than with potentially adaptive components of depressive rumination (i.e., reflection) (Treyner et al., 2003). Interestingly, grief rumination was a unique determinant of the outcomes of losing a loved one: it predicts symptoms of anxiety, depression and complicated grief after the loss of a loved one, even when controlling for relevant loss-related and sociodemographic variables and other types of rumination. Notably, grief rumination appeared to be a stronger predictor of complicated grief symptoms than other types of ruminative thinking.

This pattern of results has multiple implications. First, it corroborates the theoretical position that a grief process may be influenced by more than one type of ruminative thinking, as both depressive rumination and grief rumination were significant predictors of symptoms of psychopathology. Second, these two forms of ruminative thinking may be differentially related to persistence and development of different types of psychopathology symptoms. For instance, while grief rumination has been found to be a better predictor of complicated grief symptoms, both concurrently and prospectively (Eisma et al., 2012), brooding is a better concurrent predictor of anxiety symptoms. Third, putting these findings in a broader perspective, results support a differentiated view of various types of repetitive thinking as unique context-specific cognitive styles (e.g., Calmes & Roberts, 2007; Rood, Roelofs, Bögels, Nolen-Hoeksema, & Schouten, 2009), rather than subtypes of general repetitive thinking (e.g., McEvoy, Mahoney, & Moulds, 2010). Although we acknowledge that identifying generic mechanisms that underlie the effects of most types of repetitive thought is crucial (Watkins, 2008; Watkins & Moulds, 2012), current results suggest that it is also important to determine for whom, and under what circumstances, specific types of repetitive thinking are adaptive or maladaptive.

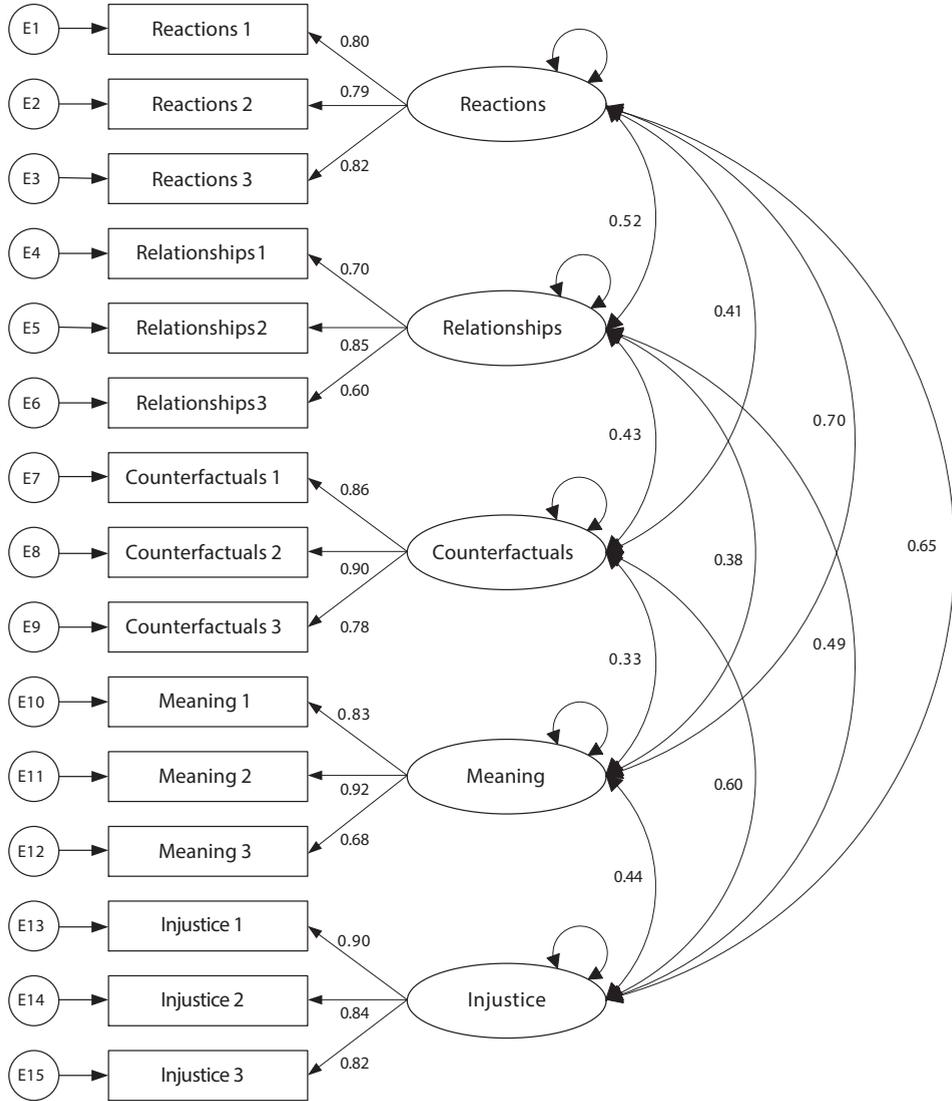
Despite the promising results and potential implications of this study, a number of limitations need to be considered. First, all participants were recruited via internet. This implies that some potential participants were excluded from participation in this study. For instance, in 2011, 17% of UK residents between 16 and 75 years of age (ONS, 2011) and 6% of Dutch adults (CBS, 2011) had no internet access. In the UK, people who use the internet generally have a higher income and are less likely to be disabled than people with no internet access (ONS, 2011). Consequently, low income groups and people with disabilities may have been underrepresented in the English sample.

Second, we used a voluntary response sample. As a result of self-selection more women than men participated in these studies. According to Stroebe et al. (2001) this stable sex difference may reflect the stronger need for women to express their feelings. However, because a large part of our samples consist of conjugally bereaved individuals, it may also demonstrate the overrepresentation of women in widowhood. Of all women over the age of 65 half is widowed compared with roughly one eighth of men (Arbuckle & de Vries, 1995). The generalizability of results across gender may therefore be limited. Notably, in previous research (Eisma et al., 2012) levels of grief rumination did not differ between men and women. This result was replicated in this research in the Dutch sample but not in the English sample; English women ruminated significantly more than English men. Given the small number of men in the English ( $n = 23$ ) and the Dutch group ( $n = 39$ ) additional research is needed to clarify if gender differences in grief-specific rumination exist.

Third, the cross-sectional nature of the current data precludes inferences about the temporal stability and the prospective predictive value of the English version of the UGRS. Longitudinal research in a Dutch sample has shown that the UGRS exhibits adequate temporal stability and good predictive validity (Eisma et al., 2012). While psychometric properties of the English and Dutch version of the UGRS show high similarity, additional prospective research is needed to address these issues.

Notwithstanding these limitations, the UGRS is the first validated instrument to measure grief-specific rumination. Based on this study, UGRS appears to be both a reliable and valid measure of grief-specific ruminative thinking. As such, it can be utilized in international scientific research on repetitive thought in bereavement, which is aimed at investigation of the pathways through which emotional problems develop and persist after a loss-experience. Moreover, the UGRS has potential clinical applicability as a brief measure to assess problematic recurrent thought in people who are confronted with bereavement.

**Figure 1** Correlated one order factor structure of the Utrecht Grief Rumination Scale in the English sample





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# Chapter 3

## Adaptive and Maladaptive Rumination After Loss: A Three-Wave Longitudinal Study

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## ABSTRACT

*Objectives:* Rumination is a risk factor after bereavement, predicting higher concurrent and prospective symptom levels of complicated grief and depression in mourners. Research has shown that rumination may consist of adaptive and maladaptive subtypes, but there has been a paucity of research in this topic in the bereavement area. Therefore, we aimed to clarify whether functional and dysfunctional forms of rumination can be distinguished after loss.

*Methods:* Two-hundred and forty-two adults, who lost a first-degree family member on average 10 months previously, filled out questionnaires at 3 time-points with 6 months between each time-point. Multiple regression analyses, controlled for loss-related variables, neuroticism and baseline symptoms, were run to examine associations of subtypes of depressive rumination (brooding, reflection) and grief rumination (rumination about injustice, meaning, reactions, relationships and counterfactual thinking) with concurrent and prospective symptom levels of complicated grief and depression.

*Results:* Overall, grief rumination explained more variance in symptom levels than depressive rumination. Other major findings were that grief rumination about injustice predicted higher concurrent and prospective symptom levels of complicated grief and higher prospective symptom levels of depression. In contrast, grief rumination about emotional reactions was related to prospective reductions in symptoms of complicated grief. Reflection was also associated with prospective reductions of complicated grief and depressive symptom levels.

*Conclusions:* Results indicate that adaptive and maladaptive forms of ruminative thinking can be distinguished in bereaved individuals. Therapeutic interventions for complicated grief could potentially be improved by including techniques aimed at reducing maladaptive rumination and increasing adaptive rumination.

Repetitive thinking, that is, recurrently thinking about one's self, one's concerns and one's experiences, has been the topic of a great deal of research over the past four decades (for reviews: Mor & Winquist, 2002; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins, 2008). The majority of this research has focused on identifying maladaptive types of repetitive thinking. In particular, rumination, defined as repetitively and recurrently thinking about negative emotions (Nolen-Hoeksema & Morrow, 1991) and/or negative events (e.g., Michael, Halligan, Clark, & Ehlers, 2007), was related to various types of psychopathology, including anxiety, depression, complicated grief and posttraumatic stress (for reviews: Heron-Delaney, Kenardy, Charlton, & Matsuoka, 2013; Olatunji, Naragon-Gainey, & Wolitzky-Taylor, 2013; Watkins & Moulds, 2013).

Although clinicians were early to recognise the importance of ruminative thinking in adaptation to loss (e.g., Freud, 1917/1957; Lindemann, 1944), the first large-scale studies on the consequences of rumination following bereavement were conducted in the mid-nineties. These studies showed that depressive rumination, recurrently focusing on depressive symptoms and their causes and consequences, predicted increases in depression severity after the death of a family member (Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Parker, & Larson, 1994), and the onset of a depressive episode after child loss even when controlling for psychiatric history and demographic variables (Ito et al., 2003). Generally, these studies have supported an association between depressive rumination and loss-related mental health problems.

More recently, grief rumination (i.e., repetitive thinking about the causes and consequences of the loss and loss-related emotions) has received increasing attention (for a brief review: Eisma et al., 2014). Grief rumination is associated with and prospectively predicts increases in levels of depression, posttraumatic stress, complicated grief and general distress in persons who have experienced the death of a first-degree family member (e.g., Boelen, van den Hout, & van den Bout, 2003; Boelen & van den Hout, 2008; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Eisma et al., 2013; van der Houwen, Stroebe, Schut, Stroebe, & van den Bout, 2010). Moreover, grief rumination has been found to be a stronger predictor of complicated grief and depression severity than other forms of rumination (Eisma et al., 2012, 2013). Research thus supports a role of grief rumination in persistence of distress after bereavement and underlines the importance of differentiation between various forms of rumination in adjustment to loss.

Studies of repetitive thinking in mourners have mirrored the tendency of researchers to focus primarily on identifying dysfunctional forms of repetitive thought. However, in other domains, attempts have been made to distinguish adaptive from maladaptive forms of repetitive thinking (e.g., Trapnell & Campbell, 1999; Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Watkins, 2008). For instance, based on motivational theories and the five-factor model of personality, Trapnell and Campbell (1999) categorised rumination and reflection as different forms of private self-attentiveness. Whereas ruminative self-focus is motivated by perceived threats, losses and injustices to the self, and associated with neuroticism and depression, reflective self-focus is motivated by curiosity or epistemic interest in the self and associated with openness to

experiences and positive mental health consequences. In line with these ideas, ruminative self-focus has been related to decreased happiness and increased levels of depression (Elliot & Coker, 2008; Takano & Tanno, 2009), increased reactivity after negative interpersonal events (Takano, Sakamoto, & Tanno, 2011), and more negative and less positive memory content (Teasdale & Green, 2004). Conversely, reflective self-focus was related to increased happiness and lower levels of depression (Elliot & Coker, 2008; Takano & Tanno, 2009), but not to reactivity after negative interpersonal events (Takano et al., 2011) or memory content (Teasdale & Green, 2004).

A similar distinction between adaptive and maladaptive forms of repetitive thinking in depression was made by Treynor and colleagues (2003), who discerned “reflection” from “brooding”, as different forms of depressive rumination on the basis of a factor analysis of the Ruminative Response Scale of the Response Style Questionnaire (RRS-RSQ; Nolen-Hoeksema & Morrow, 1991). Reflection was interpreted as “a purposeful turning inward to engage in cognitive problem solving to alleviate one’s depressive symptoms” and brooding was interpreted as “a passive comparison of one’s current situation with some unachieved standard” (Treynor et al., 2003, pp. 256). In support of this distinction, brooding is more strongly related to symptom levels of anxiety and depression than reflection (for a review: Olatunji et al., 2013). Brooding also predicted prospective increases in depressive symptoms, whereas reflection predicted decreases in depressive symptoms (Treynor et al., 2003). Moreover, brooding, but not reflection, was related to attention biases toward depressive material in a dot-probe task (Joormann, Dkane, & Gotlib, 2006). Brooding also concurrently mediated or moderated relationships between various risk factors in depression (e.g., autobiographical memory specificity, negative cognitive styles, childhood emotional abuse, immature defense styles, passive coping) and depressive symptoms, whereas reflection did not (e.g., Debeer, Hermans, & Raes, 2011; Kwon & Olson, 2007; Lo, Ho, & Hollon, 2008; Raes & Hermans, 2008; Marroquin, Fontes, Scioletta, & Miranda, 2010).

Further support for the distinction between adaptive and maladaptive components of repetitive thinking comes from factor analyses of multiple measures of repetitive thinking (e.g., Segerstrom, Stanton, Alden, & Shortridge, 2003; Siegle, Moore, & Thase, 2004). For example, Siegle and colleagues (2004) conducted an exploratory factor analysis on various measures of ruminative coping and distinguished factors of negatively-valenced rumination and more neutrally-valenced reflection. Similarly, in an influential review on repetitive thinking, Watkins (2008) concluded that not only the valence of repetitive thinking is important in determining its outcomes, but also of the level of construal. On the one hand, high-level construals are characterised by abstract, general, superordinate, decontextualized mental representations that convey the general gist or meaning of events and actions. On the other hand, low-level construals are characterised by more concrete mental representations that include subordinate, contextual, specific, and incidental details of events and actions. More abstract repetitive thinking may have negative effects on mental health by interfering with problem solving and self-regulation and by increasing negative overgeneralisations about the self in response to negative events (Watkins, 2008, pp. 187-189).

A distinction between functional and dysfunctional aspects of repetitive thinking after bereavement is theoretically and clinically important, not least because such knowledge can be applied in the design and improvement of interventions aimed at reducing loss-specific distress (for a review: Wittouck, Van Autreve, De Jaegere, Portzky, & Van Heeringen, 2011). Yet, this issue has received limited attention. Some studies support the distinction between previously-defined adaptive and maladaptive forms of repetitive thinking following loss. For example, in two recently bereaved samples, brooding, but not reflection, was concurrently associated with symptoms of depression and complicated grief (Eisma et al., 2014). Moreover, brooding concurrently mediated relationships between potential risk factors in adjustment to loss (self-concept clarity, perceived centrality of a loss) and complicated grief symptom levels (Boelen, 2012; Boelen, Keijsers, & van den Hout, 2012). However, some inconsistent results have been reported with regard to effects of previously-defined adaptive and maladaptive forms of rumination in bereavement. For example, brooding and reflection (Treyner et al., 2003) and ruminative self-focus (Trapnell & Campbell, 1999) did not significantly predict prospective symptom change in depression and complicated grief, whereas a grief rumination did (Eisma et al., 2012, 2013). In sum, there is some preliminary evidence that previously-identified subtypes of repetitive thinking (i.e., brooding) are maladaptive after loss, whereas other subtypes (i.e., reflection) may have more benign effects. However, grief rumination appears a stronger prospective predictor of loss-related mental health than brooding and ruminative self-focus. This raises the question whether adaptive and maladaptive subtypes of grief rumination can be identified, and if so, what the defining characteristics of these forms of rumination would be.

Notably, factor analyses of a newly-developed instrument to measure grief rumination, the Utrecht Grief Rumination Scale (UGRS; Eisma et al., 2014), showed that five factors of grief rumination can be distinguished: rumination about injustice, meaning, personal reactions, social relationships and counterfactual thinking. Some components of grief rumination are neutrally-valenced and appear related to the adaptive, reflective component of rumination. For example, grief rumination about personal reactions captures recurring attempts of bereaved individuals to gain deeper understanding of their emotional reactions to the loss (Example item: "In the past month I tried to understand my feelings about the loss"). Other components of grief rumination are more negatively-valenced and seem to represent maladaptive forms of rumination, similar to depressive brooding. For instance, grief rumination about injustice consists of repetitive comparisons of the current situation with an unrealised or unattainable alternative (Example item: "In the past month I wondered why this had to happen to me and not someone else"). Interestingly, of all subtypes of grief rumination, rumination about injustice showed the strongest relationship with depressive brooding ( $r = .53-.60$ ), whereas rumination about reactions was most strongly associated with depressive reflection ( $r = .41-.43$ ) (Eisma et al., 2014). This suggests that it may be possible to differentiate functional from dysfunctional types of grief rumination.

In the current study we aimed to investigate adaptive and maladaptive effects of depressive and grief rumination following loss. In order to do so, we examined the predictive value of two types of depressive rumination (i.e., brooding, reflection) and five types of grief rumination (i.e., rumination about injustice, meaning, reactions, relationships, counterfactual thinking) on concurrent and prospective symptom levels of depression and complicated grief in a recently bereaved sample. We predicted that both depressive and grief rumination subtypes would be associated with mental health problems at baseline. However, we hypothesized that depressive brooding would predict deterioration of mental health over time, whereas reflection would predict improved mental health (cf. Treynor et al., 2003). Similarly, we predicted that grief rumination about injustice would be related to worse mental health over time, while grief rumination about reactions would be predictive of better mental health.

## METHODS

### Sample and procedure

Participants were recruited through advertisements on websites for organisations for bereaved individuals and on the content network of Google. In each advertisement, a link was provided to a website specifically designed for this research project, on which people could access an online questionnaire after reading information about the study (e.g., on goals of the study, privacy, voluntariness) and providing informed consent. Research was conducted in line with local ethical guidelines. Participants who indicated that they would like to be approached for a follow-up of this study were sent an e-mail again after 6 (Time 2) and 12 months (Time 3). In total, 242 people who lost a first-degree family member in the past three years participated. Of these participants, 183 (75.6%) filled out a questionnaire after 6 months and 155 (64.0%) filled out all three questionnaires. No significant differences were found on loss-related and demographic characteristics, rumination or symptom levels between participants who dropped out and participants who completed all questionnaires.

Table 1 shows the sample characteristics. At baseline, the loss had occurred on average about 10 months previously (Mean = 9.6; SD = 8.3). Most participants (69.3%) had lost a family member less than one year ago. A majority had lost a partner (51.5%) or a parent (30.3%). The most frequently reported cause of death was natural (88.9%).

At the first measurement moment, the mean score on the Inventory of Complicated Grief – Revised (ICG-R; Prigerson & Jacobs, 2001) was 55.3 (SD = 22.9). A majority of participants (56.0%) scored higher than 25 on the original, shorter version of the ICG (Prigerson et al., 1995), indicating that they potentially experienced more problems in social, mental, emotional and physical health than non-clinically bereaved individuals. The mean score on the depression subscale of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaitch, 1983) was 9.7 (SD = 5.0). 60.3% of all participants scored above 7, a threshold for clinical levels of depression (Bjelland,

Haug, Dahl, & Neckelmann, 2002). Time since loss at baseline was not significantly associated with complicated grief symptoms,  $r(240) = -.12$ ,  $p = .06$ , but was negatively associated with depressive symptoms,  $r(241) = -.23$ ,  $p < .001$ .

**Table 1** Sample characteristics ( $N=242$ )

| <b>Demographic characteristics</b>            |             |
|---|-------------|
| Sex ( $N$ (Valid %))                          |             |
| Male  | 31 (12.9)   |
| Female  | 210 (87.1)  |
| Age in years ( $M$ ( $SD$ ))                  | 48.7 (11.7) |
| Education level                               |             |
| Primary school                                | 2 (0.8)     |
| High school                                   | 68 (28.2)   |
| Vocational school                             | 81 (33.5)   |
| Higher education                              | 90 (37.3)   |
| <b>Loss-related characteristics</b>           |             |
| Deceased is ( $N$ (Valid %))                  |             |
| Partner                                       | 124 (51.5)  |
| Parent  | 73 (30.3)   |
| Child   | 22 (9.1)    |
| Sibling                                       | 22 (9.1)    |
| Cause of loss ( $N$ (Valid %))                |             |
| Natural causes (e.g., illness, heart failure) | 213 (88.8)  |
| Accident                                      | 12 (5.0)    |
| Suicide                                       | 14 (5.8)    |
| Murder  | 1 (0.4)     |
| Loss was ( $N$ (Valid %))                     |             |
| Expected                                      | 105 (43.4)  |
| Unexpected                                    | 110 (45.5)  |
| Both or neither                               | 27 (11.1)   |
| Time since loss in months ( $M$ ( $SD$ ))     | 9.6 (8.3)   |
| Loss occurred ( $N$ (Valid %))                |             |
| Less than 1 year ago                          | 167 (69.3)  |
| Between 1 and 2 years ago                     | 64 (26.6)   |
| Between 2 and 3 years ago                     | 10 (4.1)    |

## Questionnaires

**Sociodemographic and loss-related characteristics.** Characteristics of the participant (age, sex and education level) and characteristics of the deceased and the loss (kinship, time since the loss, cause of death and expectedness of the death) were measured with a self-constructed questionnaire.

**Depressive rumination.** The brooding and reflection subscales (5 items each) of the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991; Treynor et al., 2003) were used to assess depressive rumination. Respondents were asked to indicate how often they exhibit certain behavior if they feel sad, blue or depressed on a four-point scale, ranging from almost 1 (*never*) to 4 (*almost always*). An example item of the brooding scale is: "I think about a recent situation wishing it had gone better." An example item of the reflection subscale is: "I analyze recent events to understand why I feel depressed." Research in Dutch samples has corroborated the reliability and validity of the RRS (Schoofs et al., 2010). Internal consistencies of the brooding and reflection subscales were adequate in the current sample, with  $\alpha$ 's of .75 and .79, respectively.

**Grief rumination.** The 15-item Utrecht Grief Rumination Scale (UGRS; Eisma et al., 2012, 2014) was used to measure grief rumination, repetitive and recurrent thinking about causes and consequences of the loss and loss-related emotions. The UGRS consists of five subscales of three items each. Participants indicate how often they have experienced certain thoughts during the past month, on a five-point Likert-scale ranging from 1 (*never*) to 5 (*very often*). The subscale *Reactions* measures thoughts about personal reactions to the loss (e.g., "How often (in the past month) did you try to analyse your feelings about this loss precisely?"). The subscale *Injustice* assesses thoughts about the unfairness of the death (e.g., "How often did you ask yourself what you have done to deserve this?"). The subscale *Counterfactuals* measures counterfactual thoughts about the events leading up to the death (e.g., "How often did you analyse if you could have prevented the death?"). The subscale *Meaning* assesses thoughts about the meaning and consequences of the loss (e.g., "How often did you analyse what the personal meaning of the loss is for you?"). The subscale *Relationships* measures thoughts related to social interactions (e.g., "How often did you think about how you would like others to react to your loss?"). Multiple studies have supported the reliability and validity of the UGRS (Eisma et al., 2012, 2014). In the present sample, internal consistencies of the subscales of the UGRS were adequate to excellent, with  $\alpha$ 's ranging from .68 to .90.

**Depressive symptoms.** Symptoms of depression were measured with the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The HADS has been shown to be a reliable and valid measure of depressive symptoms in several large Dutch samples, including clinical and non-clinical samples (Spinhoven et al., 1997). The HADS depression subscale consists of seven statements about experiences that tap depressive symptoms. Participants indicated how often or to what extent they have had these experiences in the past week on four-point Likert-scales. The reliability of the depression subscale was good in this sample,  $\alpha = .89$ .

**Complicated grief symptoms.** Symptoms of complicated grief were measured with the Inventory of Complicated Grief Revised, a reliable and valid instrument to assess pathological grief responses (ICG-R; Prigerson & Jacobs, 2001; Dutch translation: Boelen, van den Bout, de Keijser, & Hoijtink, 2003). The Dutch version consists of 29 statements about symptoms of complicated grief. Participants indicate how often or intensely they have experienced these symptoms over

the past month. Answers are given on a five-point Likert-scale ranging from 0 (*almost never*) to 4 (*always*). The reliability of the ICG-R was excellent in the current sample,  $\alpha = .95$ .

**Neuroticism.** As a control variable, neuroticism, trait emotional instability, a general vulnerability factor in the development of psychopathology (Ormel, Rosmalen, & Farmer, 2004), was assessed with the neuroticism subscale of the Big Five Inventory (BFI: John & Srivastava, 1999; Dutch translation: Denissen, Geenen, Van Aken, Gosling, & Potter, 2008). The BFI was validated in a large internet-based Dutch community sample and showed good reliability and construct validity. Participants were asked to indicate their agreement with eight statements regarding their perceptions of themselves in various situations on a five-point Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree). In the current study, the internal consistency of the neuroticism subscale of the BFI was good,  $\alpha = .81$ .

### Statistical analyses

Before our main analyses, multiple regression analyses were conducted to determine which demographic and loss-related variables predicted baseline symptom levels and symptom level change in complicated grief and depression at 6 and 12 months (for a review of demographic and loss-related variables predicting mental health after loss: Stroebe, Schut, & Stroebe, 2007). Variables that significantly predicted symptom levels or symptom change were controlled for in our main analyses. Additionally, neuroticism was included as a predictor on all analyses, in order to rule out the effects of general trait vulnerability to development of psychopathology (Ormel et al., 2004). In our main analyses, hierarchical multiple regression analyses were used to assess the predictive value of subtypes of rumination on symptom levels of depression and complicated grief. Analyses on depressive and grief rumination were run separately to rule out the influence of potential overlap between rumination measures. Analyses were conducted using SPSS 20.0.

## RESULTS

### Preliminary analyses

As mentioned, we first conducted multiple regression analyses on symptom levels and symptom level change in which all demographic and loss-related variables were entered simultaneously. Time since loss and kinship predicted baseline complicated grief and depressive symptoms and symptom change at all time-points, except complicated grief symptom change at 6 months. Time since loss and kinship were therefore controlled for in the main analyses on symptom levels at each time point. Cause of death was exclusively related to baseline complicated grief symptoms, but not to symptom levels at other time points, and was therefore not controlled for in our main analyses. Table 2 shows correlations between all subtypes of rumination and neuroticism. Table 3 shows correlations between subtypes of rumination and neuroticism and symptom levels of complicated grief and depression at each time point.

**Table 2** Correlations between rumination subtypes and neuroticism at baseline

|                         | RRS<br>Reflection | UGRS<br>Injustice | UGRS<br>Reactions | UGRS<br>Counter-<br>factuals | UGRS<br>Meaning | UGRS<br>Relation-<br>ships | Neuroticism      |
|-------------------------|-------------------|-------------------|-------------------|------------------------------|-----------------|----------------------------|------------------|
| RRS<br>Brooding         | .33               | .59               | .40               | .38                          | .19             | .45                        | .55              |
| RRS<br>Reflection       |                   | .02<br><i>ns</i>  | .30               | .16                          | .17             | .25                        | .21              |
| UGRS<br>Injustice       |                   |                   | .25               | .36                          | .35             | .37                        | .34              |
| UGRS<br>Reactions       |                   |                   |                   | .38                          | .43             | .45                        | .18              |
| UGRS<br>Counterfactuals |                   |                   |                   |                              | .26             | .29                        | .20              |
| UGRS<br>Meaning         |                   |                   |                   |                              |                 | .38                        | .11<br><i>ns</i> |
| UGRS<br>Relationships   |                   |                   |                   |                              |                 |                            | .36              |

Note. RRS = Ruminative Response Scale. UGRS = Utrecht Grief Rumination Scale. All correlations are significant at  $p < .01$  unless otherwise specified. *ns* = non-significant.

**Table 3** Correlations between psychological variables at baseline and symptoms of complicated grief and depression at baseline (T1) after six months (T2) and after twelve months (T3)

|                         | Complicated<br>grief T1 | Complicated<br>grief T2 | Complicated<br>grief T3 | Depression<br>T1 | Depression<br>T2 | Depression<br>T3 |
|-------------------------|-------------------------|-------------------------|-------------------------|------------------|------------------|------------------|
| RRS<br>Brooding         | .68                     | .47                     | .42                     | .48              | .39              | .37              |
| RRS<br>Reflection       | .23                     | .08<br><i>ns</i>        | .03<br><i>ns</i>        | .12<br><i>ns</i> | .05<br><i>ns</i> | .04<br><i>ns</i> |
| UGRS<br>Injustice       | .66                     | .60                     | .58                     | .40              | .41              | .39              |
| UGRS<br>Reactions       | .43                     | .25                     | .22                     | .25              | .20              | .11<br><i>ns</i> |
| UGRS<br>Counterfactuals | .45                     | .40                     | .33                     | .28              | .22              | .23              |
| UGRS<br>Meaning         | .40                     | .31                     | .33                     | .31              | .22              | .24              |
| UGRS<br>Relationships   | .49                     | .42                     | .42                     | .37              | .33              | .29              |
| Neuroticism             | .52                     | .43                     | .37                     | .51              | .42              | .42              |

RRS = Ruminative Response Scale. UGRS = Utrecht Grief Rumination Scale. All correlations are significant at  $p < .01$  unless otherwise specified. *ns* = non-significant.

### Regression analyses with depressive rumination predicting concurrent symptom levels

To examine associations between subtypes of depressive rumination and concurrent symptom levels, two hierarchical multiple regression analyses were run. Independent variables were entered in three blocks: i) relevant loss-related variables (that significantly predicted symptom levels concurrently), ii) neuroticism, iii) depressive rumination subtypes (i.e., brooding and reflection). Table 4 and Table 5 show the percentages of explained variance by each step and the regression coefficients for each predictor in regression analyses predicting concurrent symptoms of complicated grief and depression.

A first model significantly predicted complicated grief symptoms,  $F(7, 229) = 43.76, p < .001$ . Depressive rumination explained 17.8% of additional variance in complicated grief symptoms. Brooding was a significant predictor of symptom levels,  $\beta = 0.50, p < .001$ , but reflection was not,  $\beta = 0.03, p > .10$ . The model predicting concurrent depressive symptoms was also significant,  $F(7, 230) = 27.91, p < .001$ . Depressive rumination predicted 3.3% of unique variance in depressive symptoms. As before, brooding was significantly related to symptom levels of depression,  $\beta = 0.22, p < .001$ , but reflection was not,  $\beta = 0.01, p > .10$ .

### Regression analyses with depressive rumination predicting prospective symptom levels

Subsequently, we examined the predictive value of baseline depressive rumination for symptom level change in complicated grief and depression after 6 months (T2) and 12 months (T3). In order to do so, four hierarchical multiple regression analyses were conducted. This time, independent variables were entered in four blocks: i) baseline symptom levels, ii) relevant loss-related variables, iii) neuroticism, and iv) depressive rumination (i.e., brooding and reflection). Table 4 and Table 5 show the results of these analyses.

The model predicting T2 complicated grief symptom levels was significant,  $F(8, 167) = 54.29, p < .001$ . Only baseline symptoms and depressive rumination were significant predictors of complicated grief symptoms. Depressive rumination explained a small amount of variance (1.1%). Reflection significantly predicted symptom levels,  $\beta = -.08, p = .03$ , but brooding did not,  $\beta = -.08, p = .08$ . The model predicting T3 complicated grief symptom levels was also significant,  $F(8, 139) = 41.82, p < .001$ . All blocks significantly predicted symptom level change, except neuroticism. This time, depressive rumination explained 1.9% of variance. However, results were unexpected: both brooding and reflection were related to decreases in symptom levels of complicated grief,  $\beta = -.13, p = .02$ , and  $\beta = -.10, p = .03$ , respectively.

Next, we examined predictors of depressive symptoms at T2 and T3. The model predicting T2 depressive symptoms was significant,  $F(8, 172) = 33.31, p < .001$ . Baseline symptoms and loss-related variables were significant predictors of depressive symptoms, but neuroticism and depressive rumination were not, with the latter block explaining only 0.7% of variance.

Nevertheless, reflection was significantly related to decreases in symptom levels of depression,  $\beta = -.09, p = .046$ . Results for the model predicting T3 symptom levels were similar,  $F(8, 144) = 28.17, p < .001$ . Again, reflection predicted a reduction in depressive symptoms,  $\beta = -.09, p = .046$ . Brooding was no significant predictor in either model.

**Table 4** Associations between subtypes of depressive rumination at baseline and symptoms of complicated grief at baseline (T1) after six months (T2) and after twelve months (T3)

| Complicated grief | T1         |              |         | T2         |              |         | T3         |              |         |
|-------------------|------------|--------------|---------|------------|--------------|---------|------------|--------------|---------|
|                   | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ |
| Step 1            | -          | -            | -       | 401.11**   | .69          |         | 273.71**   | .65          |         |
| T1 symptoms       |            |              |         |            |              | .87**   |            |              | .91**   |
| Step 2            | 6.03**     | .09          |         | 2.01†      | .01          |         | 3.86**     | .03          |         |
| Time since loss   |            |              | -.15**  |            |              | .03     |            |              | .14**   |
| Kinship 1         |            |              | .24**   |            |              | .05     |            |              | .00     |
| Kinship 2         |            |              | .16**   |            |              | .06     |            |              | .06     |
| Kinship 3         |            |              | .01     |            |              | -.08†   |            |              | -.12*   |
| Step 3            | 114.34**   | .30          |         | 0.00       | .00          |         | 0.37       | .00          |         |
| Neuroticism       |            |              | .26**   |            |              | .04     |            |              | .00     |
| Step 4            | 47.67**    | .18          |         | 3.36*      | .01          |         | 4.59*      | .02          |         |
| RRS Brooding      |            |              | .50**   |            |              | -.08†   |            |              | -.13*   |
| RRS Reflection    |            |              | .03     |            |              | -.08*   |            |              | -.10*   |

Note. RRS = Ruminative Response Scale. Kinship is dummy-coded. Kinship 1 = partner vs. parent, Kinship 2 = child vs. parent, Kinship 3 = sibling vs. parent. \*\* =  $p < .01$ , \* =  $p < .05$ , † =  $p < .10$ .

**Table 5** Associations between subtypes of depressive rumination at baseline and symptoms of depression at baseline (T1) six months (T2) and twelve months (T3)

| Depression      | T1         |              |         | T2         |              |         | T3         |              |         |
|-----------------|------------|--------------|---------|------------|--------------|---------|------------|--------------|---------|
|                 | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ |
| Step 1          | -          | -            | -       | 240.64**   | .57          |         | 183.20**   | .55          |         |
| T1 Symptoms     |            |              |         |            |              | .75**   |            |              | .71**   |
| Step 2          | 9.89**     | .15          |         | 2.75*      | .03          |         | 4.81**     | .05          |         |
| Time since loss |            |              | -.26**  |            |              | .09†    |            |              | .15*    |
| Kinship 1       |            |              | .30**   |            |              | .13*    |            |              | .15*    |
| Kinship 2       |            |              | .20**   |            |              | .04     |            |              | .11†    |
| Kinship 3       |            |              | .04     |            |              | .00     |            |              | -.05    |
| Step 3          | 113.40**   | .28          |         | 0.74       | .00          |         | 0.69       | .00          |         |
| Neuroticism     |            |              | .41**   |            |              | .01     |            |              | .05     |
| Step 4          | 7.12**     | .03          |         | 1.60       | .01          |         | 1.44       | .01          |         |
| RRS Brooding    |            |              | .22**   |            |              | .06     |            |              | .03     |
| RRS Reflection  |            |              | .01     |            |              | -.09*   |            |              | -.09*   |

Note. RRS = Ruminative Response Scale. Kinship is dummy-coded. Kinship 1 = partner vs. parent, Kinship 2 = child vs. parent, Kinship 3 = sibling vs. parent. \*\* =  $p < .01$ , \* =  $p < .05$ , † =  $p < .10$ .

### Regression analyses with grief rumination predicting concurrent symptom levels

To examine the relationship between subtypes of grief rumination and concurrent symptom levels of complicated grief and depression, two hierarchical multiple regression analyses were run, consisting of three blocks: i) relevant loss-related variables, ii) neuroticism, iii) grief rumination (i.e., rumination about injustice, reactions, meaning, social relationships and counterfactual thinking). Table 6 and 7 show the results of these analyses.

The model predicting concurrent symptoms of complicated grief was significant,  $F(10, 226) = 43.56, p < .001$ . Grief rumination explained 26.3% of incremental variance in complicated grief symptoms. Rumination about injustice,  $\beta = .35, p < .001$ , rumination about relationships,  $\beta = .14, p = .002$ , and counterfactual thinking,  $\beta = .19, p < .001$ , predicted higher symptom levels. Rumination about meaning was not significantly related to complicated grief symptoms,  $\beta = .07, p = .08$ . Rumination about reactions was also no significant predictor,  $\beta = .05, p > .10$ .

The model predicting concurrent depressive symptoms was also significant,  $F(10, 227) = 21.14, p < .001$ . Grief rumination explained 5.7% of additional variance in depressive symptoms. Rumination about meaning and counterfactual thinking were significant predictors of depressive symptoms, with,  $\beta = .11, p = .03$ , and,  $\beta = .12, p = .01$ , respectively. No other significant results were found.

### Regression analyses with grief rumination predicting prospective symptom levels

The predictive value of baseline grief rumination on T2 and T3 symptom levels was examined with four hierarchical multiple regression analyses, built up in four blocks: i) baseline symptom levels, ii) relevant loss-related variables, iii) neuroticism, iv) grief rumination subtypes. Details on these analyses are shown Table 6 and 7.

The model predicting T2 complicated grief symptoms yielded an overall significant effect,  $F(7, 163) = 42.04, p < .001$ . All blocks, except neuroticism, predicted unique proportions of variance. Grief rumination explained 2.8% of additional variance. Increases in symptom levels were predicted by rumination about injustice,  $\beta = .17, p = .002$ . Conversely, rumination on reactions was predictive of reductions in complicated grief symptoms,  $\beta = -.17, p < .001$ . The model predicting T3 symptom levels of complicated grief was also significant  $F(11, 135) = 30.33, p < .001$ . Each block, except neuroticism, explained additional variance. Grief rumination explained 2.4% of additional variance in complicated grief symptoms. Increases in symptom levels were predicted by rumination about relationships,  $\beta = .11, p = .03$ . Rumination about reactions predicted decreases in complicated grief symptoms,  $\beta = -.17, p = .002$ .

Next, we investigated predictors of depressive symptoms at T2 and T3. Significant overall effects were found for the model predicting T2 symptoms,  $F(11, 168) = 25.18, p < .001$ , and the model predicting T3 symptoms,  $F(11, 140) = 20.36, p < .001$ . Only the blocks baseline symptom levels and loss-related variables were significant predictors at each time-point. Nevertheless, grief rumination explained 2.1% of additional variance in depressive symptoms at T2 and 1.4% at T3. In these analyses, rumination about injustice was the only subtype of grief rumination significantly related to increases in depressive symptoms at T2,  $\beta = .18, p = .002$ , and T3,  $\beta = .13, p = .03$ .

**Table 6** Associations between subtypes of grief rumination at baseline and symptoms of complicated grief at baseline (T1) six months (T2) and twelve months (T3)

| <i>Complicated grief</i> | T1         |              |         | T2         |              |         | T3         |              |         |
|--------------------------|------------|--------------|---------|------------|--------------|---------|------------|--------------|---------|
|                          | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ |
| <i>Step 1</i>            | -          | -            | -       | 399.00**   | .70          |         | 272.71**   | .65          |         |
| Baseline symptoms        |            |              |         |            |              | .75**   |            |              | .77**   |
| <i>Step 2</i>            | 6.11**     | .10          |         | 1.98†      | .01          |         | 3.86*      | .03          |         |
| Time since loss          |            |              | -.14**  |            |              | -.01    |            |              | .11*    |
| Kinship 1                |            |              | .16**   |            |              | .09†    |            |              | .01     |
| Kinship 2                |            |              | .06     |            |              | .07     |            |              | .06     |
| Kinship 3                |            |              | .02     |            |              | -.06    |            |              | -.10*   |
| <i>Step 3</i>            | 114.81**   | .30          |         | .00        | .00          |         | 0.33       | .00          |         |
| Neuroticism              |            |              | .32**   |            |              | -.02    |            |              | -.05    |
| <i>Step 4</i>            | 34.77**    | .26          |         | 3.54**     | .03          |         | 2.26*      | .02          |         |
| UGRS Injustice           |            |              | .35**   |            |              | .17**   |            |              | .11†    |
| UGRS Reactions           |            |              | .04     |            |              | -.17**  |            |              | -.17**  |
| UGRS Counterfactuals     |            |              | .17**   |            |              | .01     |            |              | -.03    |
| UGRS Meaning             |            |              | .06†    |            |              | -.05    |            |              | .06     |
| UGRS Relationships       |            |              | .14**   |            |              | .08†    |            |              | .11*    |

Note. UGRS = Utrecht Grief Rumination Scale. Kinship is dummy coded. Kinship 1 = partner vs. parent, Kinship 2 = child vs. parent, Kinship 3 = sibling vs. parent. \*\* =  $p < .01$ , \* =  $p < .05$ , † =  $p < .10$ .

**Table 7** Associations between subtypes of grief rumination at baseline and symptoms of depression at baseline (T1) six months (T2) and twelve months (T3)

| <i>Depression</i>    | T1         |              |         | T2         |              |         | T3         |              |         |
|----------------------|------------|--------------|---------|------------|--------------|---------|------------|--------------|---------|
|                      | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ |
| <i>Step 1</i>        | -          | -            | -       | 240.07**   | .57          |         | 181.49**   | .55          |         |
| Baseline symptoms    |            |              |         |            |              | .72**   |            |              | .67**   |
| <i>Step 2</i>        | 9.87**     | .15          |         | 2.81*      | .03          |         | 4.79**     | .05          |         |
| Time since loss      |            |              | -.26**  |            |              | .09     |            |              | .11*    |
| Kinship 1            |            |              | .26**   |            |              | .12*    |            |              | .15*    |
| Kinship 2            |            |              | .15**   |            |              | .04     |            |              | .11†    |
| Kinship 3            |            |              | .04     |            |              | .00     |            |              | -.04    |
| <i>Step 3</i>        | 113.45**   | .28          |         | 0.75       | .00          |         | 0.69       | .00          |         |
| Neuroticism          |            |              | .45**   |            |              | .00     |            |              | .03     |
| <i>Step 4</i>        | 4.96**     | .06          |         | 1.84†      | .02          |         | .99        | .01          |         |
| UGRS Injustice       |            |              | .07     |            |              | .18**   |            |              | .13*    |
| UGRS Reactions       |            |              | -.04    |            |              | -.06    |            |              | -.11†   |
| UGRS Counterfactuals |            |              | .12*    |            |              | -.06    |            |              | -.01    |
| UGRS Meaning         |            |              | .11*    |            |              | -.03    |            |              | .03     |
| UGRS Relationships   |            |              | .09†    |            |              | .04     |            |              | .00     |

Note. UGRS = Utrecht Grief Rumination Scale. Kinship is dummy-coded. Kinship 1 = partner vs. parent, Kinship 2 = child vs. parent, Kinship 3 = sibling vs. parent. \*\* =  $p < .01$ , \* =  $p < .05$ , † =  $p < .10$ .

## DISCUSSION

The aim of this study was to investigate concurrent and prospective associations between forms of depressive and grief rumination and symptom levels of complicated grief and depression in a recently bereaved sample. A first main finding was that subtypes of grief rumination were stronger predictors of loss-related distress than depressive brooding and reflection, consistently explaining more variance in symptom levels of complicated grief at each time point<sup>1</sup>. This accords nicely with previous research showing that general grief rumination was a stronger predictor than self-focused rumination and brooding and reflection of prospective symptom change in complicated grief and depression (Eisma et al., 2012; Eisma et al., 2013).

A second main finding of this study was that functional and dysfunctional forms of rumination after loss could indeed be distinguished. On the one hand, (depressive) reflection and grief rumination about reactions appear to represent adaptive components of ruminative coping after bereavement. These types of rumination were not concurrent predictors of symptom levels and predict reductions in complicated grief symptom levels after 6 and 12 months. Additionally, reflection longitudinally predicted small but significant reductions in depressive symptoms over time. On the other hand, grief rumination about injustice and social relationships seem to represent maladaptive forms of rumination in bereavement. Rumination about injustice was positively related to concurrent and prospective symptom levels of complicated grief and predicted increases in depressive symptoms at six and twelve months. Rumination about social relationships also played a unique role in explaining adjustment to loss, being positively associated with complicated grief symptom levels concurrently and prospectively.

Results with regard to other forms of rumination were less clear-cut. Notably, brooding was only positively related to concurrent symptoms of depression and complicated grief, and predicted decreases in complicated grief symptoms after a year. Interestingly, some previous inconsistent results have been found with regard to the adaptive effects of reflection and the maladaptive effects of brooding. For instance, reflection interacted with suicide attempt history in predicting increases in suicidal ideation in suicide attempters over and above depressive symptoms, but brooding did not (Surrence, Miranda, Marroquín, & Chan, 2009). Although other null-results have been found (e.g., Joormann et al., 2006), brooding has – to the best of our knowledge – not previously been linked with adaptive outcomes. Of note is that brooding showed positive zero-

<sup>1</sup> Although we did not formally compare the predictive value of depressive and grief rumination subtypes in a series of multiple regression analyses in the current manuscript, the percentage of explained variance in complicated grief symptoms is consistently higher for grief rumination subtypes than for depressive rumination subtypes. In multiple regression analyses that included subtypes of depressive and grief rumination, grief rumination subtypes explained incremental variance over and above loss-related variables, neuroticism and depressive rumination subtypes in complicated grief symptoms at baseline,  $\Delta F(5, 222) = 16.71, p < .001, \Delta R^2 = .12$ , and complicated grief symptom change after six months,  $\Delta F(5, 161) = 3.53, p < .01, \Delta R^2 = .03$ , and after 12 months,  $\Delta F(5, 133) = 2.15, p = .06, \Delta R^2 = .02$ . These analyses have been added as an appendix.

order associations with complicated grief symptom levels at each time point, but the relationship between brooding and complicated grief symptoms after 12 months became negative after controlling for baseline symptoms<sup>2</sup>. Although such suppressor effects should be interpreted with caution if found on only one occasion (Wiggins, 1973), they have been found to be replicable and to convey meaningful information (Paulhus, Robins, Trzeniewski & Tracy, 2004). Since this is the first time the effect of brooding was investigated over an extended interval in a bereaved sample, it may imply brooding could have small positive long-term effects on adjustment to the death of a loved one. However, more research is clearly needed to replicate these findings. Finally, both rumination about the meaning of the loss and counterfactual thinking appear to be benign forms of grief rumination, being only concurrently related to symptom levels.

In summary, adaptive types of rumination in this study (i.e., reflection, rumination on reactions) were characterized by neutrally-valenced, relatively concrete, self-focused thinking aimed at understanding depressive and loss-related emotional reactions. Conversely, the form of rumination most consistently related to negative effects on mental health, rumination on injustice, was characterized by negatively-valenced, relatively abstract, self-focused thinking about injustice and passive comparisons of the current situation with unrealized alternatives. This appears to correspond with earlier research aiming to delineate functional and dysfunctional forms of self-focused attention (Trapnell & Campbell, 1999; Treynor et al., 2003). Moreover, this pattern of results appears to be in line with dominant theories suggesting that both valence (Nolen-Hoeksema et al., 2008) and level of construal (Watkins, 2008) are important in understanding effects of repetitive thinking.

However, where rumination subtypes fall on these dimensions clearly does not explain all results. Although most subtypes of grief rumination (except rumination about injustice) are neutrally-valenced, only rumination about reactions was related to positive outcomes and rumination about relationships was even related to increases in complicated grief symptoms. Similarly, whereas grief rumination subtypes vary on the dimension abstractness, a relatively abstract form of grief rumination, rumination about meaning (i.e., thinking repetitively about the meaning and consequences of the loss-event), did not predict deterioration of mental health over time. Finally, and most notably, depressive brooding is both negatively valenced and abstract, but failed to predict increases in symptom levels over time and even predicted a decrease in complicated grief symptoms after a year.

A potential explanation for these findings could be that the content-specificity of rumination also plays a role in determining its outcomes. Since rumination may be a self-regulation strategy aimed at reducing relevant discrepancies between the current situation and unrealized alternatives (Martin & Tesser, 1996), it seems logical that individuals ruminate most about the

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2 Removing all other predictors (loss-related variables, neuroticism, reflection) except baseline symptoms in the regression model in which depressive rumination predicted complicated grief levels at T3 did not alter the direction and significance of the association between brooding and complicated grief at T3.

discrepancies that are most salient to them. For instance, depressed individuals will ruminate about the often unclear causes and consequences of their depressed mood (Nolen-Hoeksema et al., 2008), whereas rumination about a traumatic event is predominantly focused on the causes and consequences of this negative life-event (Michael et al., 2007), and rumination in social anxiety is focused on concerns about performance in social situations (Mellings & Alden, 2000). Since most discrepancies experienced by mourners are intrinsically linked with the loss-experience, it seems logical that grief rumination about the injustice of the loss is a more frequently engaged in and is a stronger predictor of mental health after bereavement than brooding. A different yet related argument is that grief rumination may be a better predictor than depressive rumination, because all mourners have experienced a loss, but not all mourners experience elevated levels of depression.

Finally, this study had a number of limitations. First, we relied exclusively on self-report measures. Other methods, such as structured interviews (e.g., Michael et al., 2007), may have yielded more detailed information on the adaptive and maladaptive characteristics of rumination in mourners. Second, as is common in bereavement research, conjugally bereaved women were overrepresented in our sample. While this may be due to a general overrepresentation of women in widowhood, it could also be the result of a stronger need of women to share their emotional experiences (Stroebe, Stroebe, & Schut, 2001). Although women generally ruminate more than men (e.g., Butler & Nolen-Hoeksema, 1994), we currently have no reasons to assume that associations between rumination and symptom levels are different for men and women. Third, we conducted this study in a sample of bereaved individuals with non-clinical to clinical complicated grief and depression levels. While the major advantage of this approach is that it rules out a potential restriction of range that limits the size of associations (Edwards, 1976), research in a bereaved sample with more severe symptom levels may yield larger effects.

Despite these limitations, this research has provided insight into the effects of rumination in adjustment to bereavement. It has confirmed the importance of a distinction of grief-specific and depressive rumination in adjustment to loss. Moreover, it has illustrated that functional and dysfunctional forms of rumination can potentially be distinguished in bereaved individuals. If future research confirms these findings, this could have implications for clinical practice. Specifically, therapeutic interventions for complicated grief (Wittouck et al., 2011) could benefit from including therapeutic techniques aimed at reducing maladaptive rumination (for a review: Querstret & Croypley, 2013), and increasing adaptive rumination.

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**Working Mechanisms**

# **PART 2**



# Chapter 4

## Avoidance Processes Mediate The Relationship Between Rumination And Symptoms Of Complicated Grief And Depression Following Loss

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## ABSTRACT

*Objectives:* Ruminative coping has been associated with negative outcomes in bereavement. Rather than assuming it to be a problematic confrontation process, researchers have recently suggested rumination to be maladaptive through its links with avoidance processes. The main aim of this study was to examine, for the first time, whether the relationship between ruminative coping and symptoms of complicated grief and depression is mediated by avoidance processes (suppression, memory/experiential avoidance, behavioral avoidance, loss-reality avoidance).

*Methods:* A sample of 282 adults (88% female), bereaved on average 18 months previously, filled out 3 questionnaires at 6-month intervals. We assessed symptom levels, grief rumination and trait rumination at baseline; avoidance processes after 6 months; and symptom levels after 12 months.

*Results:* When controlling for initial symptom levels, experiential avoidance mediated the link between grief rumination and complicated grief, and experiential avoidance and behavioral avoidance mediated the link between grief rumination and depression. Post-hoc analyses showed suppression may also mediate the link between grief rumination and symptoms of complicated grief, but not depression. Loss-reality avoidance was no significant mediator of these relationships.

*Conclusions:* This study provides initial evidence that rumination during bereavement increases and perpetuates symptoms of psychopathology, because it is linked with specific avoidance processes. Bereaved individuals with problematic grief and (chronic) rumination may benefit from therapy focused on countering avoidance tendencies.

Rumination, broadly defined as recurrent, self-focused negative thinking about past negative experiences and/or negative mood (Michael, Halligan, Clark, & Ehlers, 2007) has been proposed as a risk factor for the development of depression (Nolen-Hoeksema, 2001; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008) and complicated grief (Boelen, van den Bout, & van den Hout, 2003; Stroebe, Boelen, van den Hout, Stroebe, Salemink, & van den Bout, 2007) after the loss of a loved one. Indeed, ruminative thought<sup>1</sup> following bereavement is related to and predicts symptoms of depression, posttraumatic stress and complicated grief (e.g., Boelen & van den Hout, 2008; Eisma, Stroebe, Schut, Boelen, van den Bout, & Stroebe, 2012; Nolen-Hoeksema, Parker, & Larson, 1994).

A frequently used framework to understand the negative effects of rumination after bereavement is Response Style Theory (RST) (Nolen-Hoeksema, 2001). According to RST rumination has negative consequences after the loss of a loved one because it: (i) repeatedly focuses the attention on negative emotions making negative thoughts more accessible and salient, (ii) interferes with problem solving, (iii) impedes instrumental behavior and (iv) drives away social support. While rumination was considered “the opposite of avoidance and denial/suppression” in early accounts of RST (Nolen-Hoeksema & Larson, 1999), many scientists have since argued that rumination may be similar or strongly related to avoidance, which may (at least partly) account for the adverse consequences of ruminative thinking (Boelen et al., 2006; Martell, Addis, & Jacobson, 2001; Nolen-Hoeksema et al., 2008; Stroebe et al., 2007; Wenzlaff & Luxton, 2003; Williams et al., 2007).

Notably, Stroebe and colleagues (2007) proposed that ruminative thought after the loss of a loved one may serve an avoidant function. According to their Rumination as Avoidance Hypothesis (RAH) chronically ruminating about one’s feelings, the loss event and associated problems can serve as an “excuse” not to face up to the most painful aspects of a loss-experience. For instance, if the reality of the death may be too negative or emotionally overwhelming to confront, rumination can distract the bereaved individual from this reality. A similar line of reasoning is provided by Boelen and colleagues (2006), who proposed that bereaved individuals engage in continuous rumination about their own reactions and reasons why the loss occurred as a means to escape from having to admit the loss and the emotions linked with it. Chronic high levels of ruminative thought consequently cause grief complications, because they impede the acceptance of the loss (Stroebe et al., 2007) and block the integration of the loss with autobiographical memory about the self and the relationship with the lost person (Boelen et al., 2006; cf. Ehlers & Clark,

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1 Throughout this article multiple sources are cited, which use varying methods to assess ruminative thinking. Apart from differences in the content of rumination measures, an important difference between such instruments is if they aim to measure a general tendency to ruminate, such as the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999), or if they aim to measure the amount of ruminative coping people engage in over a specific time-period, such as the adapted Ruminative Response Scale to measure daily rumination levels used by Dickson and colleagues (2012). In the current research we employed both types of rumination measures. The Rumination Reflection Questionnaire was used to assess the general tendency to engage in ruminative thinking. The Utrecht Grief Rumination Scale (Eisma et al., 2012) assessed the extent to which individuals engaged in grief-specific rumination over the past month.

2000). Thus, scientists claim that rumination after bereavement is more similar to avoidance than confrontation. Yet, no research to date has explicitly investigated this proposition. Therefore, in the current study the relationship between rumination and avoidance after the loss of a loved one will be examined. Moreover, because scientific literature contains more than one hypothesis regarding the link between rumination and avoidance, three different hypotheses will be discussed and their relative importance will be investigated.

The first hypothesis is that rumination could facilitate thought suppression, which we will refer to as the ‘suppression hypothesis’. It is based on the notion that intentional suppression of an unwanted thought requires replacement of the unwanted material with other thoughts (Wenzlaff & Wegner, 2000). When a bereaved individual attempts to distract him or herself from painful thoughts about the reality of the loss one would expect this person to think about topics unrelated to the loss, because this is likely to be much more effective than thinking about topics that are loss-related (cf. Wenzlaff, Wegner, & Roper, 1988). However, since loss-related material is much more accessible for people with severe complicated grief symptoms (Boelen, Huntjens, van Deursen, & van den Hout, 2010; Maccallum & Bryant, 2010), these individuals may use this loss-related material to distract themselves from the reality of the death. As such, ruminating about one’s feelings and associated loss-related problems may contribute to suppression, which disrupts the grieving process. In support of this hypothesis, there is evidence for an association between rumination and suppression (Kühn, Vanderhasselt, De Raedt, & Gallinat, 2012; Liverant, Kamholz, Sloan & Brown, 2011; Wenzlaff & Luxton, 2003) and cognitive avoidance (Dickson, Ciesla, & Reily, 2012; Moulds, Kandris, Starr, & Wong, 2007).

The second hypothesis about the way in which rumination contributes to avoidance is through its influence on memory processes. This hypothesis will be referred to as the ‘memory hypothesis’, because it is based on theories on overgeneral autobiographical memories (for reviews, see: Sumner, 2012; Williams et al., 2007). Because this hypothesis is complex, we discuss it in some detail, to clarify this second potential link between rumination and avoidance. People suffering from complicated grief generally report more overgeneral autobiographical memories in response to cue words in an autobiographical memory test, or AMT (Williams & Broadbent, 1986). When asked to describe a specific event, they often provide memories that describe a category of similar events (e.g., I used to have breakfast with my wife every morning), rather than something that happened at a specific time and place (e.g. I had the last breakfast with my wife on the first Monday morning of December). This less specific retrieval style is thought to serve as a strategy to “functionally avoid” extreme negative affect. Retrieving memories of negative events (i.e., the death of a loved one) in less specific ways is thought to generate less emotional distress during recall in comparison to retrieving such memories in more specific ways. As a result, it is proposed that this less specific retrieval style is less disruptive to the individual than a more specific retrieval style, because the influence of potentially emotional material is dampened (Conway & Pleydell-Pearce, 2000; Williams et al., 2007).

Crucially, one of several mechanisms thought to underlie overgeneral memory is called “capture and rumination”. It is posited that individuals can remain at more general levels of memory representation if conceptual information activated during the early stages of memory retrieval is related to one’s personal concerns and/or self-representations. If such information is highly elaborated and therefore easily activated, then individuals can be “captured” at this level. When this occurs, individuals are likely to stay focused on this conceptual information rather than accessing event-specific knowledge. Rumination, as a conceptual, and potentially chronic, self-focused thinking style, is hypothesized to increase the probability that overgeneral memories are retrieved. Specifically, rumination elaborates intermediate conceptual information in the autobiographical memory hierarchy which increases the likelihood of being captured during retrieval and decreases the likelihood that bereaved individuals retrieve specific memories (cf. Sumner, 2012; Williams et al., 2007). Taking mechanisms of functional avoidance and capture and rumination into account, it seems reasonable to assume that if chronic ruminative thinking increases overgeneral memory retrieval, it may be a mechanism through which bereaved individuals avoid (specific) highly emotional, loss-related memories.

In accordance with this *memory hypothesis*, the association between rumination and overgeneral memory has been well-documented (Sumner, 2012). Moreover, both rumination and overgeneral memory have been associated with cognitive and experiential avoidance (i.e., the avoidance of internal experiences including memories) in non-bereaved groups (e.g., Cribb, Moulds, & Carter, 2006; Dickson et al., 2012; Hermans, Defranc, Raes, Williams, & Eelen, 2005). In a group of female bereaved war survivors, Morina (2012) similarly reported a positive association between experiential avoidance and rumination. However, an important challenge to this theory is that autobiographical memories of bereaved individuals related to the deceased and the loss appear to be “immune” to the reduced specificity effect (Boelen et al., 2010; Golden, Dalgleish, & Mackintosh, 2007). For instance, using adjusted versions of the AMT, Golden and colleagues (2007) found that participants with complicated grief reported more specific memories about the life of the deceased individual than about their own life or the life of a significant other. Despite these contradictory findings, the *memory hypothesis* provides an important perspective on the relationship between rumination and cognitive avoidance after a loss-experience, which warrants further research.

A third, yet fundamentally different proposition about the relationship between ruminative thought and avoidance is provided by Nolen-Hoeksema et al. (2008), who adjusted their original view of rumination as a confrontational process to include a link with an avoidance process. Building on work of behavioral activation theorists (Ferster, 1973; Martell et al., 2001), they proposed a link between rumination and behavioral avoidance, which will be referred to as the ‘behavior avoidance hypothesis’. The basic idea of this hypothesis is that rumination helps individuals avoid the aversive environment that surrounds them by occupying attention and time. Furthermore, rumination serves to build a case that the individual is facing a hopelessly

uncontrollable situation and nothing can be done to overcome this. Rumination as such not only removes people from aversive situations, but also provides them with reasons for behavioral avoidance. As a consequence of a decreased participation in social, occupational and recreational activities, access to experiences that run counter to negative beliefs about the self and life is blocked. This, in turn, fuels negative affect and ultimately depression (Martell et al., 2001). Because inactivity may also prevent mourners from gaining experiences in the absence of the deceased person, it could also interfere with integration of the loss into abstract knowledge about the self and the relationship with the lost person, contributing to stagnation of the grief process (Boelen et al., 2006). Surprisingly, no research has yet addressed the relationship between rumination, behavioral avoidance and the development or persistence of depression and complicated grief in a bereaved sample. Sparse results from studies in non-clinical populations remain mixed. For instance, Moulds et al. (2007) reported positive associations between ruminative thought, behavioral avoidance and depression, but behavioral avoidance failed to predict rumination in a sample of adolescents over a 7-day period (Dickson et al., 2012).

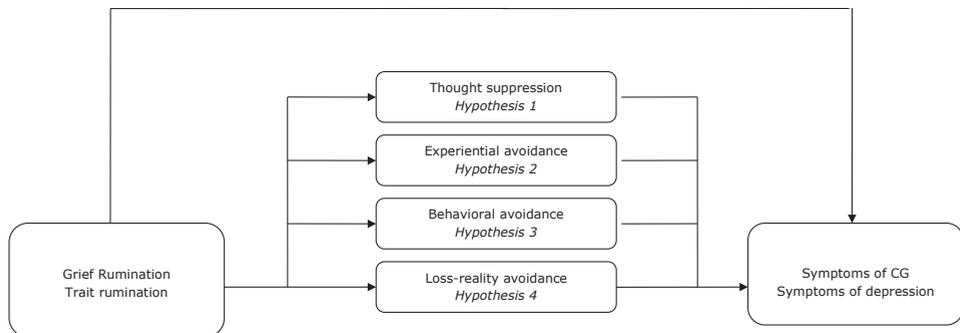
Summarizing the above, three avoidance processes are proposed to mediate the relationship between rumination and the development and persistence of psychopathology. First, according to the *suppression hypothesis*, continuous rumination about emotions and loss-related problems may facilitate suppression of thoughts about painful aspects of the reality of the loss and the emotions linked with it. Second, as stated in the *memory hypothesis*, rumination may elaborate intermediate conceptual information in the autobiographical memory hierarchy, thereby decreasing the likelihood of retrieving specific, highly emotional memories related to the loss. The consequence of both types of cognitive avoidance is that confrontation with the reality of the death is reduced, which interferes with the acceptance of the loss and integration of the loss in the autobiographical knowledge base, which ultimately contributes to grief complications. Third, the *behavioral avoidance hypothesis* holds that ruminative thought increases withdrawal from daily activities by occupying attention and time and by providing a rationale for behavioral inactivity. On the one hand, this perpetuates depression, because it blocks access to experiences that could challenge negative beliefs. On the other hand, it sustains grief complications, because it limits experiences in the absence of the deceased loved one, which could facilitate the grieving process.

Investigating these propositions is theoretically important, because it can illuminate the function of rumination. Furthermore, there are potential clinical implications. Since rumination may be a central factor in determining bereavement outcome, therapeutic interventions for people with high symptom levels of complicated grief could be targeted toward reducing ruminative thought. If rumination plays a role in behavioral avoidance, behavioral activation may be a logical therapeutic strategy to reduce these types of thought. However, if ruminative thought contributes to or is similar to cognitive avoidance, then strategies to confront this avoidance, such as exposure techniques, may be more appropriate.

Therefore, the main aim of this study was to examine, for the first time in a bereaved sample, whether avoidance prospectively mediates the relationship between rumination on the one hand, and symptoms of depression and complicated grief, on the other hand. And, if this is the case, a second aim is to determine the relative importance of each of three hypothesized avoidance processes as working mechanisms in the relationship between ruminative thought and psychopathology. Therefore, the relative contribution of three different types of avoidance to the mediation of the relation between rumination and symptoms of depression and complicated grief was examined in multiple mediation models (see Figure 1). In these models thought suppression was measured to test the *suppression hypothesis*, experiential avoidance (i.e., general avoidance of internal experiences, including memories) was measured to test the *memory hypothesis* and depressive avoidance (i.e., behavioral avoidance) was measured to test the *behavioral avoidance hypothesis*.

Finally, apart from testing the working mechanisms, a major aim of this study was to test the content specificity of the material that is avoided through rumination. As mentioned before, researchers have claimed that ruminative thought serves to avoid the most painful aspects of the loss experience, and have suggested that the reality of the loss may be an important topic that bereaved individuals aim to avoid (Boelen et al., 2006; Stroebe et al., 2007; see also: Worden, 2003). To test this proposition, a fourth hypothesis was added: we expected anxious avoidance of the loss-reality to significantly mediate the relationship between rumination and psychopathology when added to the proposed mediation models. This fourth hypothesis will be referred to as the *loss-reality avoidance hypothesis*.

**Figure 1** Proposed avoidance processes mediating the link between grief rumination and rumination and depressive and complicated grief.



*Note.* CG = Complicated Grief. We aimed to test four mediation models: 1) avoidance processes mediate the link between grief rumination and CG symptoms, 2) avoidance processes mediate the link between grief rumination and depressive symptoms, 3) avoidance processes mediate the link between trait rumination and CG symptoms, 4) avoidance processes mediate the link between trait rumination and depressive symptoms. Analyses were controlled for baseline symptom levels.

## METHOD

### Sample and procedure

This study was performed in compliance with ethical regulations of an internal ethical review board. All participants were recruited via the internet through announcements on websites for online support groups for bereaved individuals in the Netherlands or advertisements on the content network of Google. Interested individuals could link through to a website specifically designed for the current project, where information was provided about the study. People who chose to participate could fill out their address online. Within a week after filling out their address they received an informed consent form and the first questionnaire. Second and third questionnaires were sent by post to participants after six and twelve months, respectively.

The sample consisted of 282 adults (88% female) who had lost a first-degree relative in the past three years. On average the loss had occurred approximately 18 months ( $M=17.9$  months,  $SD=9.5$ ) prior to participating in this study. The demographic and loss-related characteristics of this sample are depicted in Table 1. Of the 282 participants who filled out the first questionnaire (T1), 227 (80%) filled out the questionnaire after six months (T2) and 186 (66%) filled out the questionnaire after one year (T3). No differences were found on loss- and background variables or symptom levels of depression and complicated grief between drop-outs and people who participated at all three measurement moments.

### Measures

Three different questionnaires were used to assess specific constructs at the three time-points. At the first time-point, background variables, grief rumination, trait rumination and depressive and complicated grief symptoms were measured. Six months later, thought suppression and experiential, behavioral and loss-reality avoidance were assessed. Finally, twelve months after the first measurement moment, symptoms of depression and complicated grief were measured *again*. The scales that were used are described below.

**Background information.** Characteristics of the participant (age, sex and education level) and characteristics of the deceased and the loss (relationship with deceased, time since the loss, cause of death and expectations about the death) were assessed with a self-constructed questionnaire.

**Grief rumination.** The Utrecht Grief Rumination Scale (UGRS) was used to measure grief-specific rumination, defined as recurrent, repetitive and self-focused thoughts about the causes and consequences of the loss and related negative feelings (Eisma et al., 2012). It consists of 15 items which measure different aspects of grief rumination: rumination about injustice, meaning, personal reactions and reactions of others and counterfactual thinking about the loss (e.g., "How often in the past month did you try to understand your feelings about the loss?", "How often in the past month did you analyze if you could have prevented the death?"). Participants indicated how

frequently they had experienced certain thoughts in the past month on a five-point scale ranging from “never” (1) to “very often” (5). In the current study the internal consistency of the total UGRS,  $\alpha = .87$ , was good.

**Table 1** Demographic and loss-related characteristics of the sample ( $N=282$ )

| <b>Demographic variables</b>              |             |
|---|-------------|
| Sex ( $N$ (Valid %))                      |             |
| Male                                      | 29 (10.3)   |
| Female                                    | 253 (89.7)  |
| Age in years ( $M$ ( $SD$ ))              | 49.9 (11.5) |
| Level of education ( $N$ (Valid %))       |             |
| Primary school                            | 9 (3.2)     |
| Secondary school                          | 92 (32.6)   |
| Vocational school                         | 70 (24.8)   |
| Higher education (University)             | 107 (37.9)  |
| Other                                     | 4 (1.5)     |
| <b>Loss-related variables</b>             |             |
| Deceased is ( $N$ (Valid %))              |             |
| Partner                                   | 119 (42.2)  |
| Child                                     | 55 (29.5)   |
| Parent                                    | 67 (23.8)   |
| Brother/Sister                            | 41 (14.5)   |
| Cause of loss ( $N$ (Valid %))            |             |
| Natural causes (e.g. illness)             | 234 (83.0)  |
| Accident                                  | 27 (9.6)    |
| Suicide                                   | 19 (6.7)    |
| Murder                                    | 2 (0.7)     |
| Loss was ( $N$ (Valid %))                 |             |
| Expected                                  | 98 (34.8)   |
| Unexpected                                | 164 (58.2)  |
| Different (i.e. both)                     | 20 (7.1)    |
| Time since loss in months ( $M$ ( $SD$ )) | 17.9 (9.5)  |

**Rumination.** To examine if effects generalize across different types of rumination, a measure of trait ruminative thinking, defined as anxious, self-focused attention, was included: the rumination subscale of the Rumination Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999; Dutch translation: Luyckx et al., 2007). The questionnaire consists of twelve self-descriptive statements which tap a general tendency to ruminate (e.g., “I often reflect on episodes of my life I should no longer concern myself with”, “I often find myself reevaluating something that I have done”). Participants indicated to what extent these statements are applicable to them on a five-point

scale, ranging from “strongly disagree” (1) to “strongly agree” (5). In the current sample the rumination subscale of the RRQ showed a good internal consistency,  $\alpha = .87$ .

**Suppression.** The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994; Dutch translation: Muris, Merckelbach, & Horselenberg, 1996) was used to measure thought suppression, the active effort not to think about certain thoughts. The WBSI consists of 15 self-descriptive statements (e.g., “I always try to put problems out of my mind”, “I have thoughts I try to avoid”). A participant indicated to what extent he/she agrees with these statements on a five-point scale which ranges from “strongly disagree” (1) to “strongly agree” (5). In the current sample the internal consistency of the WBSI was excellent;  $\alpha = .91$ .

**Experiential avoidance.** Experiential avoidance was measured using the Acceptance and Action Questionnaire–II (AAQ-II; Bond et al., 2011; Dutch translation: Jacobs, Kleen, de Groot, & A-Tjak, 2008). Experiential avoidance is defined as the attempt to alter the form, frequency, or situational sensitivity of difficult private events (i.e., thoughts, feelings, and physiological sensations). Example items are: “It is OK if I remember something unpleasant” (reverse scored) and “My painful memories prevent me from leading a fulfilling life.” The AAQ-II comprises 10 items with a 7-point response format and was designed as an updated version of the original 9-item AAQ (Hayes et al., 2005). The items of the AAQ were reverse-scored in this study, so that higher scores indicated more experiential avoidance, to facilitate interpretation of results. In this study the AAQ-II showed good internal consistency,  $\alpha = .89$ .

**Behavioral avoidance and loss-reality avoidance.** The Depressive and Anxious Avoidance of Prolonged Grief Questionnaire (DAAPGQ; Boelen & Van den Bout, 2010) was used to measure grief-specific avoidance processes. Five items assess behavioral avoidance, or inactivity after loss (e.g., “I avoid doing activities that used to bring me pleasure, because I feel unable to carry out these activities”, “I develop very few new activities since [...] died, because I feel unable to do so”). Four items tap avoidance of the loss-reality (e.g., “I avoid dwelling on painful thoughts that are connected to his/her death”, “I avoid to dwell on the fact that [...] is dead and will never return”). Items are rated on eight-point scales ranging from “not at all true for me” (1) to “completely true for me” (8). In the current study the behavioral avoidance and loss-reality avoidance subscales yielded excellent and adequate internal consistencies, with  $\alpha$ 's of .91 and .79, respectively.

**Symptoms of complicated grief.** Complicated grief symptoms were measured with the Inventory of Complicated Grief-Revised (ICG-R; Prigerson & Jacobs, 2001; Dutch translation by Boelen, Van den Bout, de Keijsers, & Hoijtink, 2003). The Dutch version consists of 29 statements about the frequency and intensity of symptoms of complicated grief (e.g., “I feel my life is empty without the person who died”, “I feel myself longing for the person who died”). Participants indicated how often or how intensely they have experienced these symptoms on a five-point scale. In the current study, 5 items of the ICG were removed before conducting the mediation analyses to control for potential content overlap between predictors, mediators and outcomes. Two items were removed, because they may overlap with behavioral avoidance: (i.e., “I believe

my grief has resulted in significant impairment in my social, occupational or other areas of functioning; “I think about the deceased so much that it can be hard for me to do the things that I normally do.”). Three items were removed, because they potentially overlap with grief rumination, specifically rumination about unfairness of the loss (i.e., “I have trouble accepting the death; “I feel it is unfair that I should live while the deceased has died; “I feel envious of others who have not lost someone close”). In the current study the internal consistency of the ICG was excellent,  $\alpha = .96$ .

**Symptoms of depression.** Depressive symptoms were measured with the depression subscale of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983; Dutch translation by Spinhoven, Ormel, Sloekers, Kempen, Speckers, & van Hemert, 1997). The depression subscale of the HADS consists of 7 statements about experiences which tap depressive symptoms (e.g., “I feel cheerful” (reverse scored), “I feel as if I am slowed down”) Participants indicated how often or to what extent they have had these experiences in the past week on 4-point scales. The depression subscale showed good internal consistency in this sample,  $\alpha = .89$ .

### Statistical analyses

Prior to the mediation analyses we examined the associations of background and loss-related variables at T1 with symptoms of depression and complicated grief after a year (T3), while controlling for baseline symptom levels. Using this procedure, no background and loss-related variables significantly predicted symptoms of psychopathology.

We examined if different types of avoidance processes (thought suppression, experiential avoidance, loss-reality avoidance and behavioral avoidance) after six months (T2) mediated the relationship between baseline grief rumination (T1) and complicated grief after twelve months (T3), whilst controlling for baseline symptom levels. Next, similar analyses were conducted with depressive symptoms as the dependent variable (DV). Finally, in order to investigate if findings generalize across different types of rumination, both mediation analyses were repeated with trait rumination as the independent variable (IV).

In mediation analyses, it is assumed that the total effect of an IV on a dependent variable (DV), denoted as weight  $c$ , is composed of a direct effect of the IV on the DV (weight  $c'$ ) and the indirect effect of the IV on the DV via the mediator  $M$  (i.e., the product of the effect of the IV on the  $M$  [a weight] and the effect of the  $M$  on the DV [b weight]). In case of multiple mediators, the total indirect effect (the summed  $a$  and  $b$  weights) as well as the unique effect of each individual mediator can be estimated (MacKinnon, Fairchild, & Fritz, 2007; Preacher & Hayes, 2008). Figure 1 shows a graphic representation of the mediation models that we tested.

Mediation analyses were conducted using the bootstrapping procedure for multiple mediators for SPSS developed by Preacher and Hayes (2008). Bootstrapping is a nonparametric resampling method that generates an empirical approximation of the sampling distribution of a statistic from the data and, as such, avoids the power problems associated with non-normality in the sampling distribution. The procedure provides point estimates and 95% confidence intervals for the total

and individual indirect effects. The output provides three types of confidence intervals. In the present analyses, we used 5000 bootstrap resamples and focused on the bias corrected and accelerated confidence interval. This is the most stringent test of mediation, with point estimates of indirect effects being considered significant (at  $p < .05$ ) if zero is not included in the interval.

## RESULTS

### Preliminary analyses

At baseline, 28 of 282 participants (10.0%) had total ICG-R scores above 90, a previously established threshold for clinically relevant scores of complicated grief (Boelen et al., 2003). However, 179 of 282 participants (63.5%) scored higher than 25 on the 19 items of the original ICG, a threshold at which individuals on average experienced significantly more impairments in social, general, physical and mental health in comparison to non-clinically bereaved individuals (Prigerson et al., 1995). Furthermore, distributions of complicated grief severity were approximately normal and variability was large (Mean = 52.5,  $SD = 25.6$ , Range = 3-112). Time since loss was also distributed approximately normal (Mean = 17.9 months,  $SD = 9.5$ , Range = 1-42). Moreover, the association between time since loss and complicated grief symptoms was weak and non-significant,  $r(279) = -.08$ ,  $p = 0.18$ , suggesting meaningful individual differences in grief trajectories. Thus, the sample consisted of individuals with varying amounts of time since the loss and levels of grief at baseline ranging from normal through more complicated forms. Means, standard deviations of rumination, avoidance and symptom measures at each time point and correlations between these variables are depicted in Table 2.

### Mediation analyses

As mentioned, we aimed to conduct four mediation analyses. However, of the four total effects (c paths) from each of the independent variables (grief rumination and trait rumination) on each of the dependent variables (complicated grief and depressive symptoms), the effects for trait rumination on complicated grief and depressive symptoms were not significant. Although there is some debate on this issue (for a discussion: MacKinnon, 2008), classic conceptualizations of mediation analysis hold that true mediation cannot occur in absence of a relationship between the independent variable and the dependent variable (Baron & Kenny, 1986; Holmbeck, 1997). Therefore, only the two mediation models that used grief rumination as an independent variable are reported. All avoidance strategies (thought suppression, experiential avoidance, behavioral avoidance, loss-reality avoidance) were entered simultaneously in the mediation models so that each indirect effect was corrected for every other indirect effect.

**Table 2** Correlations between independent variables, mediator variables and dependent variables and means and standard deviations.

|                           | Trait<br>rumination | Thought<br>suppression | Experiential<br>avoidance | Loss-reality<br>avoidance | Behavioral<br>avoidance | Complicated<br>grief | Depression | M    | SD   |
|---------------------------|---------------------|------------------------|---------------------------|---------------------------|-------------------------|----------------------|------------|------|------|
| Grief rumination          | .34                 | .36                    | .42                       | .32                       | .50                     | .65                  | .48        | 42.0 | 12.0 |
| Trait rumination          | -                   | .43                    | .47                       | .30                       | .26                     | .33                  | .26        | 38.8 | 9.7  |
| Thought<br>suppression    |                     | -                      | .52                       | .52                       | .42                     | .51                  | .38        | 45.9 | 13.7 |
| Experiential<br>avoidance |                     |                        | -                         | .38                       | .63                     | .64                  | .60        | 31.4 | 12.3 |
| Loss-reality<br>avoidance |                     |                        |                           | -                         | .46                     | .39                  | .32        | 12.1 | 7.2  |
| Behavioral<br>avoidance   |                     |                        |                           |                           | -                       | .74                  | .68        | 18.2 | 10.6 |
| Complicated grief         |                     |                        |                           |                           |                         | -                    | .78        | 40.6 | 24.8 |
| Depression                |                     |                        |                           |                           |                         |                      | -          | 6.2  | 5.0  |

Note. Grief rumination and trait rumination were assessed at T1, thought suppression, experiential, behavioral and loss-reality avoidance were assessed at T2, symptoms of complicated grief and depression were measured at T3. All correlations are significant at  $p < .001$ .

As Table 3 shows, the relationship between grief rumination and complicated grief symptoms is fully mediated by experiential avoidance. By contrast, the link between grief rumination and depressive symptoms is fully mediated by experiential avoidance and behavioral avoidance. Thought suppression and loss-reality avoidance do not significantly mediate these relationships. Grief rumination significantly predicts thought suppression in the mediation model with the dependent variable complicated grief symptoms, and both thought suppression and loss-reality avoidance in the mediation model predicting depressive symptoms (a paths). However, these avoidance processes fail to predict complicated grief and depressive symptoms (b paths).

**Table 3** Summary of the mediation analyses in which avoidance processes mediate the relationship between grief rumination and symptoms of complicated grief (Model 1) and depression (Model 2) corrected for baseline symptom levels.

| Model | Mediator               | Total Effect (c) | Direct Effect (c') | Total indirect effect ( $\sum a \times b$ ) | Unique indirect effect (a x b) | 95% CI     |
|-------|------------------------|------------------|--------------------|---|--------------------------------|------------|
| 1     | Experiential avoidance | 0.18†            | 0.06               | 0.11*                                       | 0.08*                          | 0.02-0.18  |
|       | Thought suppression    |                  |                    |   | 0.03                           | 0.00-0.11  |
|       | Behavioral avoidance   |                  |                    |   | 0.01                           | -0.02-0.07 |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | -0.05-0.01 |
| 2     | Experiential avoidance | 0.06*            | 0.01               | 0.05*                                       | 0.02*                          | 0.01-0.05  |
|       | Thought suppression    |                  |                    |   | -0.01                          | -0.03-0.01 |
|       | Behavioral avoidance   |                  |                    |   | 0.03*                          | 0.01-0.06  |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | 0.00-0.00  |

Note. \* = significant at  $p < .05$ . † =  $p = .09$ .

**Magnitude of mediation effects.** Partial correlation analyses were used to examine the relative size of the indirect effects. Whilst controlling for baseline symptom levels, grief rumination explained 2.0% of the variance in complicated grief symptoms, 1.8% (90.0%) of which was accounted for by avoidance processes. Grief rumination also explained 3.1% of the variance in depressive symptoms, 3.0% (96.8%) of which was accounted for by avoidance processes.

Another method to assess the effect sizes of indirect effects was proposed by MacKinnon et al. (2007), who use the formula  $[1 - c'/c]$  to calculate the proportion of the effect of an IV on a DV that

is accounted for by the mediators. Using this rule (possible values lie between 0 and 1) the effect sizes of avoidance processes mediating the link between grief rumination on the one hand and symptoms of complicated grief and depression on the other hand were .67 and .83, respectively.

### Post-hoc mediation analyses

As mentioned above, experiential avoidance (and behavioral avoidance), but not thought suppression or loss-reality avoidance, mediated the proposed relationships between ruminative thinking and symptoms of psychopathology if all avoidance processes were entered simultaneously in the multiple mediation analyses. However, experiential avoidance, broadly defined as avoidance of internal experiences (Hayes et al., 2004), potentially overlaps with avoidance of thoughts as assessed by the WBSI and the loss-reality avoidance as measured with the DAAPGQ, which primarily measures avoidance of thought content related to the loss-reality. Therefore, in order to further investigate the importance of these avoidance processes all four mediation models were rerun using only thought suppression, loss-reality avoidance and behavioral avoidance as mediator variables. In these revised mediation models (Table 4) thought suppression fully mediated the relationship between grief rumination and complicated grief symptoms. However, the link between grief rumination and symptoms of depression was fully accounted for by behavioral avoidance.

**Table 4** Summary of the post-hoc mediation analyses in which avoidance processes mediate the relationship between grief rumination and symptoms of complicated grief (Model 1) and depression (Model 2) corrected for baseline symptom levels.

| Model | Mediator               | Total Effect (c) | Direct Effect (c') | Total indirect effect ( $\Sigma a \times b$ ) | Unique indirect effect (a x b) | 95% CI     |
|-------|------------------------|------------------|--------------------|---|--------------------------------|------------|
| 1     |                        | 0.19†            | 0.11               | 0.07*   |                                | 0.00-0.18  |
|       | Thought suppression    |                  |                    |   | 0.06*                          | 0.01-0.14  |
|       | Behavioral avoidance   |                  |                    |   | 0.03                           | -0.03-0.09 |
|       | Loss-reality avoidance |                  |                    |   | -0.01                          | -0.07-0.01 |
| 2     |                        | 0.06*            | 0.02               | 0.04*   |                                | 0.01-0.07  |
|       | Thought suppression    |                  |                    |   | 0.00                           | -0.02-0.02 |
|       | Behavioral avoidance   |                  |                    |   | 0.04*                          | 0.01-0.07  |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | -0.02-0.01 |

Note. \* = significant at  $p < .05$ . † =  $p = .07$ .

**Magnitude of post hoc mediation effects.** Effect sizes of mediation effects based on partial correlations were large, yet somewhat smaller than in previous analyses. Grief rumination explained 2.0% of the variance in complicated grief symptoms, of which 1.3% (65.0%) was explained by avoidance processes. Furthermore, grief rumination explained 3.1% of variance in depressive symptoms, of which avoidance processes accounted for 2.5% (80.6%). Effect sizes determined based on the method of MacKinnon and colleagues (2007) showed a similar pattern of results. The effect sizes for the indirect effects of avoidance processes on the relationship between grief rumination and complicated grief and depressive symptoms were .58 and .67, respectively.

## DISCUSSION

In the current study we tested whether grief rumination and trait rumination significantly predicted symptoms of complicated grief and depression over a period of twelve months and if these links could be accounted for by avoidance processes. Indeed, grief rumination and trait rumination were both associated with symptoms of psychopathology over a twelve month interval. However, after correction for baseline symptom levels, only grief rumination, but not trait rumination, predicted symptoms of complicated grief and depression. Consistent with our expectancies, avoidance processes did indeed mediate the relationships between grief rumination and symptom levels. Consequently, we investigated the relative importance of different avoidance processes in the mediation of the relationship between ruminative thought and symptoms of psychopathology, using multiple mediation analyses. An interesting pattern of results emerged<sup>2</sup>. However, before we turn to these results, it is important to briefly elaborate upon the finding that grief rumination, but not trait rumination predicted symptom change. These results are broadly consistent with previous research in which grief-specific rumination, but not the general tendency to ruminate predicted symptom change in complicated grief and depression over six months in a sub-clinically bereaved sample (Eisma et al., 2012). Two important differences between the measures used to assess grief rumination (UGRS) and trait rumination (RRQ) could potentially have contributed to this result. First, the UGRS measures ruminative thoughts that are particularly likely to occur after bereavement, such as thoughts about the causes and consequences of the loss (Eisma et al., 2012), rather than a general tendency to engage in ruminative coping. Indeed, the loss of a loved one, such as the loss of a child or partner, may be so difficult to come to terms with, that a person who - under normal circumstances - would not ruminate much, could repeatedly dwell on one's feelings and the causes and consequences of the loss in order to try to grasp what has happened (Tait & Silver, 1989). Second, the UGRS measures how much rumination a person has

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2 Mediation analyses uncontrolled for symptom levels were also conducted. As these analyses provide more insight into the magnitude of associations between rumination, avoidance and symptom measures they are included as an appendix.

engaged in over the last month, rather than how much one usually ruminates. As such, it is likely to provide a more accurate approximation of the true levels of ruminative coping a bereaved person experiences at a particular point in time, thereby increasing its predictive power relative to the RRQ.

Turning next to our mediation hypotheses, a first conclusion is that the behavior avoidance hypothesis of rumination was partly confirmed. Behavioral avoidance mediated the relationship between grief rumination and symptoms of depression, but not complicated grief. This suggests that chronically thinking about one's negative emotions and the causes and consequences of the loss may indeed increase withdrawal from social, occupational and recreational activities, because it takes up time and provides reasons for inactivity. As a consequence, the bereaved person may have less time to engage in activities that could disconfirm negative thoughts, resulting in increased negative feelings and ultimately depressive symptoms (Nolen-Hoeksema et al., 2008; Martell et al., 2001). These results are in line with previous findings on the relationship between rumination, behavioral avoidance and depression (Boelen et al., 2003; Moulds et al., 2007) and illustrate that engaging in potentially meaningful and enjoyable activities may play a role in adjustment to bereavement (Shear, Boelen, & Neimeyer, 2012). However, the link between rumination and complicated grief symptoms was not mediated by behavioral avoidance. This seems to imply that the behavioral avoidance hypothesis of rumination may be limited to explaining the development and persistence of depression after loss

Second, in line with the memory hypothesis, experiential avoidance mediated the relationship between grief rumination, on the one hand, and symptoms of complicated grief and depression, on the other hand. Thus, rumination may indeed elaborate intermediate conceptual information in the autobiographical memory hierarchy, which consequently increases the likelihood of being captured during memory retrieval and decreases the likelihood that bereaved individuals retrieve specific highly emotional loss-related memories (cf. Sumner, 2012). This, in turn, interferes with the acceptance of the loss and increases grief complications.

However, these results should be interpreted with some caution. First, experiential avoidance is broadly defined as avoidance of internal experiences, which encompasses memories, but also thoughts (Hayes et al., 2004). Therefore, it may well overarch constructs such as thought suppression and anxious avoidance, which are predominantly focused on the avoidance of (specific) thought content. In line with this notion, thought suppression did indeed mediate relationships between grief rumination and symptoms of complicated grief (but not depressive symptoms) when experiential avoidance was excluded from the mediation models. This confirms the suppression hypothesis. Thus, ruminative thinking could also function as the thought content bereaved individuals use to distract themselves from more threatening thoughts, related to painful aspects of the loss, which complicates their grieving process (cf. Boelen et al., 2006). Future experimental research is needed to establish which cognitive avoidance process(es) (i.e., suppression, overgeneral memory retrieval) is/are facilitated most strongly by rumination and how this contributes to the development and persistence of psychopathology after loss.

Lastly, somewhat surprisingly, the loss-reality avoidance hypothesis was disconfirmed. Although anxious avoidance of the reality of the loss was predicted by grief rumination and trait rumination (significant *a* paths), it failed to predict complicated grief symptoms and depressive symptoms (non-significant *b* paths), even when experiential avoidance was excluded from the mediation models. This result calls into question the specific proposition that rumination has adverse consequences, because it serves to avoid the reality of the loss. However, it is important to note that while the Rumination as Avoidance Hypothesis (RAH) states that mourners may ruminate to distract themselves from what is “simply too emotionally overwhelming to confront”, such as the reality of the loss, it also holds a different proposition. According to RAH, bereaved ruminators could also continuously go over the meaning of the loss and reasons why the loss occurred, because not doing so would make them feel disloyal to the deceased (Stroebe et al., 2007). In this case, ruminators may not be avoiding the reality of the loss per se, but rather confronting personally relevant, self-related cognitions linked with the loss. As such, anxious avoidance of the loss-reality as measured with the DAAPGQ likely covers only one component of the material bereaved ruminators may attempt to avoid. Finally, the finding that thought suppression but not loss-reality avoidance mediated the relationship between grief rumination and complicated grief symptoms, does not necessarily imply that the avoidance of the reality of the loss is irrelevant. Rather, it seems to indicate that a general tendency to suppress thoughts through rumination may be more maladaptive than exclusively avoiding thought content related to the loss-reality.

This study has a number of limitations. First, not unusual for bereavement research, the sample consisted mostly of bereaved women who are on average higher-educated than the general Dutch population. Although this potentially limits the generalizability of findings across groups (i.e., men and lower-educated individuals), we are not familiar with research that suggests that the processes under investigation are fundamentally different for such other groups. Second, since the aim of our study was to investigate underlying mechanisms, we purposely selected a sample with considerable variability in symptom severity, to prevent underestimation of correlations between symptom measures and cognitive and avoidance variables (cf. Edwards, 1976). However, it is possible that effects may be more pronounced in a bereaved sample with higher symptom levels. A third limitation is that this study is based on self-report questionnaires. Addressing the current research questions using different methods can strengthen conclusions regarding the link between rumination, avoidance and psychopathology. For instance, experimental research designs could clarify the relationship between rumination, complicated grief symptoms and avoidance of the reality of the loss. Another limitation pertains to the measurement of different types of avoidance. The questionnaire we used to measure depressive avoidance is based on subjective ratings of behavioral activity. In future studies, social withdrawal could also be assessed using more objective self-report measures, such as standardized activity diaries (Hopko & Mullane, 2008). Similarly, it would be advisable to use a version of the Autobiographical Memory

Test (Williams & Broadbent, 1986) to further establish to what extent rumination plays a role in avoidance, by influencing the specificity of loss-related memories.

Despite these limitations, the current study adds to our understanding of the working mechanisms and consequences of ruminative thinking after the loss of a loved one. If future research corroborates these findings, this could have important clinical implications. Specifically, results suggest that rumination may serve as a cognitive and/or experiential avoidance strategy which also facilitates social withdrawal commonly observed in bereaved individuals, thereby fueling emotional problems after bereavement. As such, it hampers adjustment to the new reality that unfolds after the loss and prolongs the grieving process. This could imply that interventions aimed at people who experience grief complications and elevated levels of ruminative thought, should use a combination of exposure and behavioral activation techniques, embedded in cognitive behavioral therapy, to lower rumination in order to facilitate the grieving process (cf. Shear et al., 2012).

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# Chapter 5

## Is Rumination After Bereavement Linked With Loss Avoidance? Evidence From Eye-Tracking

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## ABSTRACT

*Objectives:* Rumination is a risk factor in adjustment to bereavement. It is associated with and predicts psychopathology after loss. Yet, the function of rumination in bereavement remains unclear. In the past, researchers often assumed rumination to be a maladaptive confrontation process. However, based on cognitive avoidance theories of worry in generalized anxiety disorder (GAD) and rumination after posttraumatic stress disorder (PTSD), others have suggested that rumination may serve to avoid painful aspects of the loss, thereby contributing to complicated grief.

*Methods:* To examine if rumination is linked with loss avoidance, an eye-tracking study was conducted with 54 bereaved individuals (27 high and 27 low ruminators). On 24 trials, participants looked for 10 seconds at a picture of the deceased and a picture of a stranger, randomly combined with negative, neutral or loss-related words. High ruminators were expected to show initial vigilance followed by subsequent disengagement for loss stimuli (i.e., picture deceased with a loss word) in the first 1500ms. Additionally, we expected high ruminators to avoid these loss stimuli and to show attentional preference for non-loss-related negative stimuli (i.e., picture stranger with a negative word) on longer exposure durations (1500-10000ms).

*Results:* Contrary to expectations, we found no evidence for an effect of rumination on vigilance and disengagement of loss stimuli in the first 1500ms. However, in the 1500-10000ms interval, high ruminators showed shorter gaze times for loss stimuli and longer gaze times for negative (and neutral) non-loss-related stimuli, even when controlling for depression and complicated grief symptom levels. Effects of rumination on average fixation times mirrored these findings.

*Conclusions:* This suggests that rumination and loss avoidance are closely associated. A potential clinical implication is that rumination and grief complications after bereavement may be reduced through the use of exposure and acceptance-based therapeutic techniques.

Ruminative thinking, broadly defined as repetitive and recurrent, self-focused thinking about negative emotions and/or negative events (Michael, Halligan, Clark, & Ehlers, 2007), has been identified as a risk factor in adjustment to bereavement (Eisma et al., 2014; Nolen-Hoeksema, 2001). Rumination after loss both concurrently and prospectively predicts general distress and symptoms of depression, posttraumatic stress and complicated grief (Bodnar & Kiecolt-Glaser, 1994; Boelen, van den Bout, & van den Hout, 2003; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Eisma et al., 2012, 2014; Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Parker, & Larson, 1994). Since levels of rumination may be reduced through therapy (for a review: Querstret & Cropley, 2010), it is crucial to understand the pathways through which rumination contributes to the development and persistence of mental health problems after loss. After all, this information could be used to increase efficacy of therapeutic interventions for bereaved individuals with high levels of rumination and complicated grief.

Despite a large body of research on causes, correlates and consequences of rumination in depression (for a review: Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), it is not yet entirely clear in what way rumination contributes to mental health problems after bereavement. In the past, many researchers more or less explicitly assumed rumination after stressful events to be a confrontation process (Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999; Tait & Silver, 1989). For instance, Nolen-Hoeksema and colleagues, who conducted the first large-scale studies on rumination in bereavement (Nolen-Hoeksema et al., 1994, 1997), considered rumination to be the “opposite form of coping” to denial/suppression, referring to this process as “the polar opposite of avoidance and denial” (Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999). According to their Response Styles Theory (RST), rumination has various negative effects because bereaved ruminators repeatedly *confront* themselves with their loss-related problems and emotions. As a consequence, rumination i) increases accessibility of negative thoughts, ii) interferes with problem solving, iii) impedes instrumental behavior and iv) drives away social support, thereby contributing to depression (Nolen-Hoeksema, 2001; see also: Nolen-Hoeksema et al., 2008). Notably, Nolen-Hoeksema and colleagues adjusted their original position on rumination recently to include a link with behavioral avoidance. According to this extension of RST, rumination takes up time and increases feelings of hopelessness about the current situation, thereby contributing to inactivity and social withdrawal. However, they still explicitly rejected the idea that rumination is a cognitive avoidance process (Nolen-Hoeksema et al., 2008).

In a similar vein, self-regulation theorists proposed that rumination consists of a recurrent focus on discrepancies between a current situation and a desired goal or state and is motivated by the intention to reduce such discrepancies (e.g., Martin & Tesser, 1996). Bereaved individuals may thus repeatedly focus on the loss and loss-related feelings, in order to reduce discrepancies in mood state or to come to terms with the loss (Tait & Silver, 1989). However, in the absence of any progress in reducing loss-related discrepancies, persistent focus on the loss-related problems will increase negative mood and depression.

In contrast to the notion that ruminators confront negative feelings and problems, other researchers have argued that rumination may be linked with or similar to avoidance, which could (at least partly) account for its maladaptive outcomes (Boelen, van den Hout, & van den Bout, 2006; Ehlers & Clark, 2000; Eisma et al., 2013; Martell, Addis, & Jacobson, 2001; Nolen-Hoeksema et al., 2008; Stroebe et al., 2007; Wenzlaff & Luxton, 2003). In fact, scientists from many different research areas, including the field of generalized anxiety disorder (Borkovec, Ray, & Stöber, 1998; Newman & Llera, 2011), posttraumatic stress disorder (Ehlers & Clark, 2000) and depression (Giorgio et al., 2010), have proposed that repetitive thinking styles such as rumination and worry may be cognitive avoidance processes. Of particular pertinence to the current investigation, Boelen and colleagues (2006; cf. Ehlers & Clark, 2000) suggested that bereaved individuals with complicated grief may engage in continuous rumination about their own reactions and the reasons why the loss occurred as a means to “escape” from having to admit the reality of the loss and the emotions linked with it. Stroebe and colleagues (2007) similarly state in their Rumination as Avoidance Hypothesis (RAH) that rumination following bereavement may function as a “distraction” from more emotionally-laden topics, which may be too overwhelming to confront, such as the reality of the loss. Such avoidance of painful aspects of the loss consequently interferes with acceptance of the loss (Stroebe et al., 2007; Worden, 2009), and/or integration of memories about the loss with autobiographical memories about the self and the relationship with the lost person (Boelen et al., 2006; cf. Ehlers & Clark, 2000), fueling the persistence of complicated grief.

Despite the potential theoretical implications of a link between rumination and loss-related avoidance, research on this topic has been limited. Nevertheless, some recent studies provided support for an association between rumination and avoidance after bereavement. First, in a cross-sectional survey among female widowed survivors of war, a moderate positive correlation was reported between the trait tendency to ruminate and experiential avoidance, defined as avoidance of internal experiences such as memories, thoughts and feelings (Morina, 2011). Second, in a multiple mediation study in a sample of bereaved individuals, experiential avoidance and thought suppression longitudinally mediated the relationship between grief rumination and complicated grief symptom change (Eisma et al., 2013). These findings are in line with a larger body of survey research in non-clinical and depressed samples supporting an association between rumination, cognitive and/or experiential avoidance and psychopathology (e.g., Cribb, Moulds, & Carter, 2006; Dickson, Ciesla, & Reily, 2012; Giorgio et al., 2010; Liverant, Kamholz, Sloan, & Brown, 2011; Moulds, Kandris, Starr, & Wong, 2007; Wenzlaff & Luxton, 2003).

To our knowledge, no research to date has established a relationship between rumination and behavioral - rather than self-report - measures of avoidance in bereaved individuals. However, some researchers have attempted to explicitly investigate such a link in non-bereaved samples. For example, Giorgio and colleagues (2010) invited college students high and low on trait rumination to participate in a dichotic listening task in which neutral words were presented to the non-dominant ear, whilst a depressive and a neutral story were presented in the dominant

ear. Contrary to expectations, no differences were found between high and low ruminators on the number of neutral words they recognised after the task, indicating that high ruminators did not have a preference for neutral material when this was simultaneously presented with general, negative information. In a second task, high and low ruminators were induced to engage in relaxation or rumination, after which they received a depressive mood induction (i.e., imagining the death of a loved one). They expected that high ruminators in the relaxation condition would show a physiological response (i.e., increase in heart rate) to the imagination exercise, whereas high ruminators in the rumination condition would not. Interestingly, they found that high ruminators in the relaxation and rumination conditions did not differ in their physiological response to the imagination exercise. However, the expected difference was found in the low rumination group, suggesting that the emotional suppression effect of rumination is only observed in people who do not ruminate regularly. The authors hypothesized that this difference may potentially be the result of the fact that the depressive mood induction could have led high ruminators in the relaxation condition to ruminate, whereas low ruminators in the relaxation condition were less inclined to do so. These results therefore provide preliminary evidence for an avoidant function of rumination for individuals exposed to personally-relevant threatening material (i.e., imagining the death of a loved one).

In the current investigation, we aimed to extend findings on the relationship between rumination and avoidance using a different method, that is, by studying the association between rumination and attention for loss and non-loss stimuli in a recently bereaved sample. The main reason for selecting this approach was that the study of attention is a broadly accepted, face-valid measure for the analysis of avoidance and confrontation processes (for a review: Quimet, Gawronski, & Dozois, 2009). Since hypotheses on the avoidant function of rumination state that rumination is focused on general negative topics, yet functions to avoid the reality of the loss, we studied attention for loss-related stimuli when simultaneously presented with non-loss-related negative stimuli (see: 'Stimuli development and presentation' in the Methods section).

To our knowledge, there has been no previous research on rumination and attention for personally-relevant threatening material. However, a recent review supports a link between rumination and cognitive and attentional biases toward general negative material, such as negative words and sad faces (Koster, de Lissnyder, Derakshan, & de Raedt, 2011). Notably, some researchers have aimed to clarify the link between rumination and attention for general negative material using dot-probe tasks in non-bereaved samples (Donaldson, Lam, & Mathews, 2007; Joorman, Dkane, & Gotlib, 2006). In the dot-probe task, stimuli are presented in different locations on a computer screen. After the display is terminated, a neutral probe appears in the former location of one of the stimuli. Participants' responses to the probe are timed and used to infer the allocation of attentional resources because responses will be faster to probes that appear in an attended rather than unattended area. For example, Donaldson and colleagues (2007) reported that depressed individuals compared to non-clinical controls showed a preference for negative

words when these were presented with neutral words, but only at the longer (1000ms) and not at shorter (500ms) exposure durations. This effect was more pronounced for high trait ruminators, compared to low trait ruminators, but inductions of rumination and distraction did not influence results. Similarly, others found that depressive rumination was related to attentional bias for sad faces as opposed to neutral faces in depressed individuals at 1000ms (Joorman et al., 2006). In sum, these studies indicate that a stronger tendency to ruminate is related to attention biases toward general negative material, yet only after longer exposure durations.

Whereas hypotheses on rumination and attentional patterns for general negative material can be formulated on the basis of previous investigations, the relationship between rumination and attention for personally-relevant threatening material (i.e., death of a loved one) has not previously been investigated. Therefore, we predicted that higher levels of rumination would be associated with typical anxious attentional response patterns for stimuli that represent the loss. In a recent review, Ouimet and colleagues (2009) described this fearful pattern of attention as being characterised by initial, subconscious orientation toward threatening stimuli (0-500ms), followed by attentional disengagement (500-1500ms) and avoidance of threatening stimuli beyond exposure times of 1500ms (e.g., Calvo & Avero, 2005; Rinck & Becker, 2006). Accordingly, we expected high ruminators but not low ruminators to show initial vigilance and subsequent avoidance of stimuli that represent the loss and, as mentioned, a preference for general negative material at longer exposure durations.

In order to assess such attention patterns, we employed eye-tracking technology, as it offers a number of distinct advantages over other attentional tasks, such as the dot-probe paradigm. First, eye-tracking enables the study of patterns of attention, rather than the attention to certain stimuli at a fixed moment in time. It therefore offers a more fine-grained perspective on viewing behavior, rather than giving a mere 'snapshot' of attention (Rinck & Becker, 2006). Second, eye-tracking is a more reliable measure of attention for emotional material than dot-probe tasks, especially for longer exposure durations (Waechter, Nelson, Wright, Hyatt, & Oakman, 2014). Finally, as eye tracking does not employ measurement of reaction times, this limits the effects of age and familiarity with computer tasks on outcomes. This may be of particular importance in the current investigation because the bereaved population is on average older than the general population.

In short, we aimed to assess the link between rumination and attentional avoidance of loss cues in a bereaved sample. Our predictions with regard to gaze times (total time spent looking at a stimulus in a specific interval) for this study were: High ruminators, compared to low ruminators, will show increased attention for stimuli that represent the loss on short exposure durations (0-500ms). High ruminators, compared to low ruminators, will consequently disengage attention for stimuli that represent the loss during longer exposure durations (500-1500ms). High ruminators, compared to low ruminators, will continue to divert attention away from stimuli that represent the loss on extended exposure durations (1500-10000ms). These avoidant attention patterns

were expected to be mirrored in attention for non-loss-related negative cues. That is, we expected that high ruminators, in comparison to low ruminators, would show heightened attention for non-loss-related negative stimuli on extended exposure durations (1500-10000ms). Finally, we predicted high ruminators would show shorter average fixation times (time spent looking at a stimulus each time one looks at it) for loss stimuli and longer average fixation times for non-loss-related negative stimuli, when compared to low ruminators. All effects were expected to remain significant even after controlling for loss-related distress, operationalized as symptom levels of depression and complicated grief.

## METHOD

### Sample

Participants were pre-selected on the basis of their scores on a scale to measure grief-specific rumination, the Utrecht Grief Rumination Scale (UGRS; Eisma et al., 2012; 2014), from a database of recently bereaved adults who previously participated in a questionnaire study, and were asked and agreed to participate in an additional study. Only participants scoring in the lowest and highest quartile of the UGRS (Range: 15-75) in this previous study were selected for participation in the current investigation. During the present study the UGRS was re-administered to assess present levels of grief rumination. The total sample consisted of 54 participants, divided into 27 high ruminators ( $M$  UGRS score = 50.19,  $SD$  = 9.88), and 27 low ruminators ( $M$  UGRS score = 27.00,  $SD$  = 4.29). All participants had normal or adjusted to normal vision, as evidenced by their ability to read instructions on a computer screen before the start of the eye-tracking task. Sample characteristics are shown in Table 1.

### Procedure

This research was conducted with the approval of the Institutional Review Board of GGZ Nederland (METIGG) and has been conducted in line with the principles expressed in the Declaration of Helsinki. Before the start of the study, each participant was informed about the study and provided written informed consent. The pictures of two people are shown in this manuscript (Figure 1). The individuals in this manuscript have given written informed consent to publish these case details. The study consisted of two parts. First, each participant filled out a battery of questionnaires (see Section 'Questionnaires'). Second, the eye tracking system was calibrated and validated and participants read the instructions for the eye tracking task on the computer screen, shown approximately 60 cm in front of them. Participants were informed that they would be looking at pictures of the deceased and pictures of a stranger combined with various words (see section 'Stimuli development and presentation') for 10 seconds each time, for approximately 6 minutes. Participants were told they could look at the pictures as if they were looking at a photo album, and were free to gaze at any part of the screen, but not outside the screen. In between trials, a

fixation cross would be shown for five seconds in the centre of the screen and participants were asked to look at this fixation cross if nothing else was depicted on the screen. This fixation cross was used to prevent participants from looking at the left or right side of the screen before the start of the trial. After completion of two additional tasks (not reported in this paper) participants were debriefed and received 20 euros for their participation and a travel expense form.

**Table 1** Sample characteristics of high and low ruminators.

|  | Low ruminators<br>( <i>N</i> = 27) | High ruminators<br>( <i>N</i> = 27) |
|--|------------------------------------|-------------------------------------|
| <b>Demographic variables</b>                             |                                    |                                     |
| Sex ( <i>N</i> (Valid %))                                |                                    |                                     |
| Male   | 3 (11)                             | 5 (18)                              |
| Female   | 24 (89)                            | 22 (82)                             |
| Age in years ( <i>M</i> ( <i>SD</i> ))                   | 54.5 (8.4)                         | 54.0 (11.9)                         |
| <b>Loss-related variables</b>                            |                                    |                                     |
| Deceased is ( <i>N</i> (Valid %))                        |                                    |                                     |
| Partner  | 11 (41)                            | 14 (52)                             |
| Child  | 6 (22)                             | 9 (33)                              |
| Parent   | 6 (22)                             | 1 (4)                               |
| Sibling  | 4 (15)                             | 3 (11)                              |
| Cause of loss ( <i>N</i> (Valid %))                      |                                    |                                     |
| Natural causes (e.g., illness, heart failure)            | 21 (78)                            | 20 (74)                             |
| Accident   | 3 (11)                             | 6 (22)                              |
| Suicide  | 3 (11)                             | 1 (4)                               |
| Loss was ( <i>N</i> (Valid %))                           |                                    |                                     |
| Expected   | 11 (41)                            | 5 (19)                              |
| Unexpected   | 14 (52)                            | 20 (74)                             |
| Both or neither  | 2 (7)                              | 2 (7)                               |
| Time since loss in months ( <i>M</i> ( <i>SD</i> ))      | 25.6 (10.2)                        | 26.7 (10.7)                         |
| <b>Psychological variables</b>                           |                                    |                                     |
| Grief rumination ( <i>M</i> ( <i>SD</i> ))*              | 27.0 (4.3)                         | 50.2 (9.9)                          |
| Symptom levels of depression ( <i>M</i> ( <i>SD</i> ))*  | 10.3 (9.8)                         | 27.1 (11.4)                         |
| Symptoms of complicated grief ( <i>M</i> ( <i>SD</i> ))* | 27.8 (20.2)                        | 63.2 (22.0)                         |

Note. Categories with fewer than 5 observations were excluded from  $\chi^2$ -analyses. \* = significant difference at  $p < .001$ .

## Questionnaires

**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 expectations about the death) were assessed with a background questionnaire.

**Grief rumination.** The 15-item Utrecht Grief Rumination Scale (UGRS) was used to measure grief-specific rumination, defined as recurrent, repetitive and self-focused thoughts about the causes and consequences of the loss and related negative feelings (Eisma et al., 2012; 2014). Participants indicated how frequently they have experienced certain thoughts during the past month on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). Examples of items are: “How often in the past month did you analyze if you could have prevented the loss?” and: “How often in the past month did you try to understand your feelings about the loss precisely?” The UGRS is a reliable and valid measure of grief-related rumination (Eisma et al., 2012; 2014).

**Symptoms of depression.** As a first control variable we assessed depressive symptoms with the Center for Epidemiologic Studies Depression Scale, (CESD Scale: Radloff, 1977; Beekman, Deeg, van Limbeek, de Vries, & van Tilburg, 1997). On the 20-item CESD Scale respondents indicated how often they had experienced certain depressive feelings or 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 populations (Beekman et al., 1997).

**Symptoms of complicated grief.** As a second control variable we used symptoms of complicated grief experienced in the preceding month, measured with the Inventory of Complicated Grief-Revised, (ICG-R: Prigerson & Jacobs, 2001; Boelen, van den Bout, de Keijser, & Hoijtink, 2003). The Dutch version consists of 29 statements about the frequency and intensity of complicated grief symptoms. Answers are given on a five-point scale ranging from 0 (*almost never*) to 4 (*always*). Studies in sub-clinical samples of bereaved individuals have corroborated the reliability and validity of the ICG-R (Boelen et al., 2003).

### Stimuli development and presentation

When considering stimuli development, it is important to note that rumination has been proposed to serve as a strategy to avoid the ‘reality of the loss’. Therefore, a crucial step in our research was to develop stimuli that represent this reality. Since threat-relevant verbal material generally generates weaker emotional and attentional responses than threat-relevant images (Mathews & MacLeod, 2005), we decided not to rely exclusively on verbal stimuli. When considering pictorial stimuli, only pictures of the deceased person were considered both personally-relevant and relatively easy to standardize across participants. An additional advantage of such stimuli is that they can be matched with neutral pictures (i.e., pictures of a stranger). However, a potential problem with pictures is that they can generate different types of associations in different bereaved individuals. For example, some mourners may recall a fond memory when looking at a picture of the deceased, while others are reminded of the funeral. In order to ensure that participants associate pictures of the deceased with the loss, two picture types (deceased, stranger) were combined with different words, namely loss-related, negative, and neutral words (cf. Gündel, O’Connor, Littrell, Fort, & Lane, 2003). The crucial stimulus, representing the loss, is a picture of the deceased combined with a

loss-related word. Three other stimuli types were loss-related, but ambiguous (picture deceased + neutral word, picture deceased + negative word, picture stranger + loss-related word). Two other stimuli were non-loss-related and negative (picture stranger + negative word) and neutral (picture stranger + neutral word) in valence.

**Figure 1** An example of stimuli presented in the eye-tracking task.



*Note.* A translation of “Dimensie” and “Heengaan” is “Dimension” and “Passing”, respectively. In this trial the right picture-word combination is the loss-reality stimulus (deceased + loss word) and the left picture-word combination is a neutral stimulus (stranger + neutral word). The persons in this figure have consented to their pictures being published in an open access journal.

In order to create the picture-word-composites described above, a standardized procedure was used. Prior to the experiment, each participant was asked to provide a high quality picture of their deceased loved one. This picture was matched with a picture of a stranger on the basis of gender, age and picture type (i.e., portrait, standing outside, standing inside, sitting inside, sitting outside). Occasionally, pictures of the deceased were adjusted with Photoshop (e.g., by centring the deceased in the middle of the picture and/or removing distracting background characteristics) to ensure maximum comparability of both images.

Moreover, 48 different words, including 3 different word types, namely loss-related words (e.g., loss, death), negative words (e.g., down, sad) and neutral words (e.g., circle, square) were chosen for this study. Words of each type were matched on word frequency and word length. Beforehand, 5 independent judges rated each word on valence, on a 5-point scale ranging from -2 (very negative) to +2 (very positive), and on the extent to which they perceived these words to be associated with loss, on a 5-point scale ranging from 1 (not at all) to 5 (very much). Valence ratings for loss-related and negative words were more negative than neutral words,  $t(30) = -8.06, p < .001$ , and,  $t(30) = -9.14, p < .001$ , respectively. Loss-related words were considered to be more strongly associated with loss than negative,  $t(30) = -16.21, p < .001$ , and neutral words,  $t(30) = -11.03, p < .001$ .

Finally, each picture type (i.e., deceased, stranger) was combined with each word type (i.e., loss-related, negative, neutral) 8 times, forming a total of 48 picture-word composites, that is, 8 composites of 6 types (i.e., deceased-loss, deceased-negative, deceased-neutral, stranger-loss, stranger-negative, stranger-neutral). During the experiment these stimuli-composites were presented in pairs. On 24 trials of 10 seconds, a picture of the deceased and a picture of a stranger, each combined with a different word type, randomly appeared on the left or right side of the screen. Each trial contained a picture of the deceased and a picture of a stranger. Each word was used only once across all trials. All stimuli types appeared equally often on the left and right side of the screen. All stimuli were 800 pixels wide and 1100 pixels high and were separated by 200 pixels during presentation. The stimuli were presented against a black background on a 19-inch monitor with a 1680 x 1050 pixel resolution. For an example of possible stimuli combinations depicted on the screen see Figure 1. Eye fixations were measured at 8ms intervals for 10 seconds of presentation time on each trial with a Tobii X120 eye tracker.

### Design and statistical analyses

The first 1500ms of each 10 seconds of presentation time in each trial were analysed in detail, because we expected high ruminators, compared to low ruminators, would show vigilance and disengagement of loss stimuli in this interval. Therefore, the first 1500ms were divided into 3 intervals of 500ms each. As we expected to find different attentional patterns for high and low ruminators after 1500ms, the last 8500ms interval was analysed separately. For each interval, we calculated the average gaze time (i.e., average overall time spent looking at a stimulus during an interval) for each stimulus type. Since we were also interested in average fixation times (i.e., average time spent looking at a specific stimulus each time one looks at it), these were also calculated for each stimulus type over the full 10 seconds of presentation time.

As mentioned previously, three hypotheses were tested. First, we expected that high ruminators, compared to low ruminators, would show differential attention patterns for stimuli that represent the loss (i.e., picture deceased + loss word) in the first 1500ms, showing a vigilance-avoidance pattern for such stimuli. To test this prediction, we conducted a 2x6x3 repeated measures analysis with between level factor group (high vs. low rumination) and within factors stimuli composites, consisting of 6 picture-word combinations (deceased-loss, deceased-negative, deceased-neutral, stranger-loss, stranger-negative, stranger-neutral), and time (0-500ms, 500-1000ms, 1000-1500ms) on average gaze time.

Second, we expected high ruminators, compared to low ruminators, to avoid loss stimuli, in favor of non-loss-related negative stimuli for extended exposure durations (1500ms-10000ms). To examine this difference, a 2x6 analysis of variance with between factor group (high vs. low ruminators) and within factor stimuli composites (deceased-loss, deceased-negative, deceased-neutral, stranger-loss, stranger-negative, stranger-neutral) was conducted on average gaze time in the final 1500-10000ms interval of presentation time.

Third, we expected that avoidance of loss stimuli and preference for non-loss-related negative stimuli shown by high ruminators, when compared to low ruminators, would also be reflected in average fixation times. To test for such group differences, we conducted a 2x6 analysis of variance with the between factor group (high vs. low ruminators) and within factor stimuli composites (deceased-loss, deceased-negative, deceased-neutral, stranger-loss, stranger-negative, stranger-neutral) and the dependent variable average fixation time in the full 10 seconds of presentation time. Finally, if these overall tests showed significant results, we conducted post-hoc test to examine differences between high and low ruminators on average gaze time and fixation time for each stimulus type.

As mentioned, the effects of symptom levels of depression and complicated grief were taken into account on all analyses by including them as covariates. Notably, there is some debate as to whether analysis of covariance can be used if covariates have high correlations with the independent group variable and the dependent variable (Miller & Chapman, 2001). However, analysis of covariance is essentially equivalent to a multiple regression analysis with one categorical and one or more continuous independent variables. Therefore, although analysis of covariance does not “equate” groups on pre-existing differences, it does permit estimation of direct effects of the group variable on the dependent variable, controlling for effects of continuous independent variables (Scheres & Hamaker, 2010). All analyses were conducted with the Statistical Package for Social Sciences 20.0 (SPSS 20.0).

## RESULTS

### Preliminary analyses

**Participant exclusion and apparatus error.** Since we considered it unethical to restrict participants’ moving potential, while watching highly emotional pictures, we did not use a chin-rest during experimental tasks. As a consequence, the eye tracker failed to register gaze direction for 7 participants (4 high and 3 low ruminators) and 80 % of all gaze directions for 1 participant (1 high ruminator). Gaze times for a specific stimulus type in a specific interval (i.e., 0-500ms, 500-1000ms, 1000-1500ms, 1500-10000ms) were excluded from the analyses if less than fifty percent of gaze times on all relevant trials could be determined (3.9% of all intervals). Two participants were excluded on the basis of their attention patterns. Although first fixation errors (i.e., not looking at the fixation cross when a trial started) were uncommon ( $M = 2.15$ ,  $SD = 2.25$ ), one participant had 18 fixation errors in 24 trials and was therefore excluded. Another participant was excluded because, relative to her group (high ruminators), the majority of her mean gaze times were outliers (i.e., larger than the overall mean  $\pm 3$   $SDs$ ). In the main analyses, we included the data from 44 participants (22 high and 22 low ruminators).

**Group characteristics.** As shown in Table 1, no significant differences were found between high and low ruminators on gender,  $\chi^2(1) = .44, p = .70$ , age,  $t(52) = 0.19, p = .85$ , time since loss,  $t(52) = -0.38, p = .71$ , expectedness of the loss,  $\chi^2(2) = 3.31, p = .69$ , cause of death,  $\chi^2(3) = 2.02, p = .36$ , and the relationship with the deceased,  $\chi^2(3) = 4.67, p = .20$ . High ruminators, compared to low ruminators, did show elevated levels of symptom levels of depression,  $t(52) = -5.71, p < .001$ , and complicated grief,  $t(52) = -6.16, p < .001$ .

## Main analyses

**Analyses of gaze times from 0-1500ms.** As mentioned, to investigate early attentional bias toward loss stimuli and subsequent avoidance of these stimuli in the first 1500ms a 2x6x3 repeated-measures analysis on gaze time was executed. This analysis did not yield a significant overall effect,  $F(12,22) = 1.21, p = .34, \eta^2 = .40$ . The presence of a vigilance and avoidance pattern of attention for loss stimuli for high ruminators in comparison to low ruminators could therefore not be confirmed.

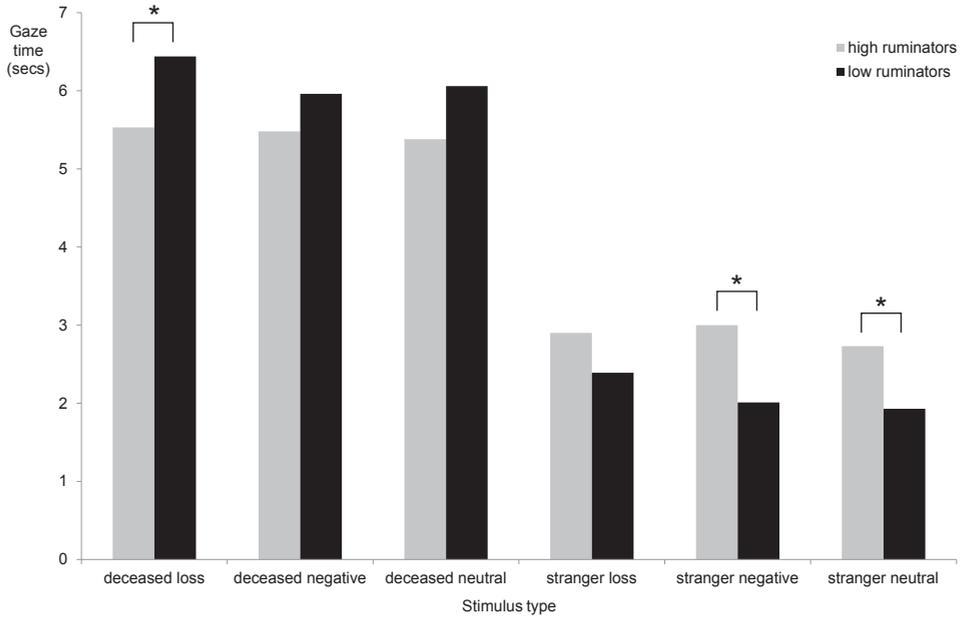
**Analyses of gaze times from 1500-10000ms.** To assess long-term attentional bias of high and low ruminators for different stimuli, average gaze times after the initial 1500ms (1500-10000ms) were compared for each stimulus type. A 2x6 analysis of variance showed a significant overall effect for rumination,  $F(6,32) = 2.98, p = .02, \eta^2 = .36$ , indicating that a difference in gaze times existed between high and low ruminators for one or more stimulus types. Control variables depressive and complicated grief symptoms showed no significant effects on gaze times,  $F(6,32) = 0.40, p = .83$ , and ,  $F(6,32) = 1.16, p = .35$ , respectively. Next, hypotheses regarding the differences in gaze times were assessed by comparing high and low ruminators on gaze time for each stimulus type. Conform expectations, high ruminators looked significantly less at pictures of the deceased combined with a loss word than low ruminators,  $F(1,37) = 3.07, p = .04, \eta^2 = .08$ . Moreover, compared to low ruminators, high ruminators spent more time looking at pictures of a stranger combined with negative words,  $F(1,37) = 4.92, p = .02, \eta^2 = .12$ , and neutral words,  $F(1,36) = 3.67, p = .03, \eta^2 = .09$ . No other group differences on gaze time in the 1500-10000ms interval were found for other stimuli types. These results confirmed the hypothesis that rumination is linked with loss avoidance. Means and standard deviations for mean gaze times are shown in Table 2 and are graphically depicted in Figures 2, 3 and 4.

**Table 2** Mean gaze times and standard deviations in seconds for each stimulus type in 1500-10000ms presentation time.

| Stimulus/<br>Group | Deceased     |             |             | Stranger    |              |              |
|--------------------|--------------|-------------|-------------|-------------|--------------|--------------|
|                    | Loss         | Negative    | Neutral     | Loss        | Negative     | Neutral      |
| High ruminators    | 5.53 (1.10)* | 5.49 (1.23) | 5.38 (1.25) | 2.90 (1.10) | 3.00 (1.11)* | 2.70 (1.14)* |
| Low ruminators     | 6.49 (1.36)* | 6.00 (1.47) | 5.98 (1.39) | 2.36 (1.51) | 1.97 (1.02)* | 1.93 (1.27)* |

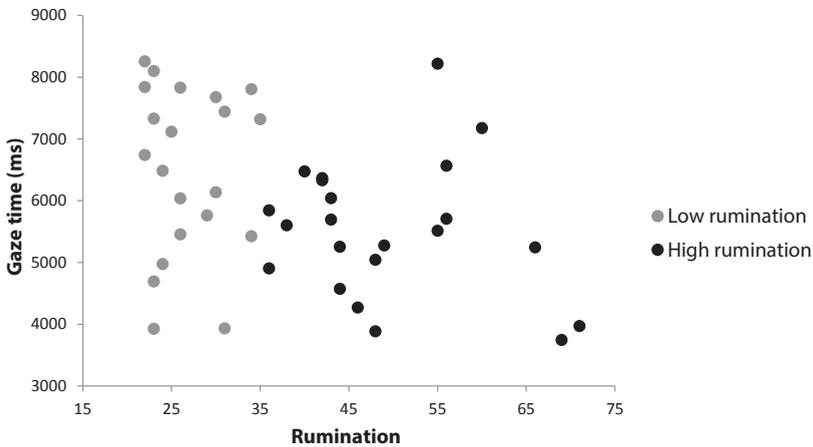
Note. Gaze time is defined as overall time spent looking at a stimulus during a specific interval. \* = significant difference at  $p < .05$  between high and low ruminators.

**Figure 2** Mean gaze times in seconds for each stimulus type in 1500-10000ms presentation time.



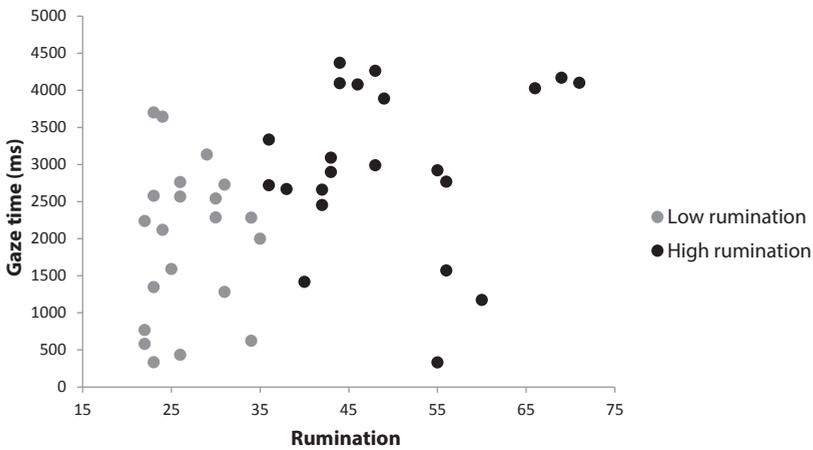
Note. Gaze time is defined as the overall time in seconds spent looking at a picture-word combination (i.e., deceased + loss word, deceased + negative word, deceased + neutral word, stranger + loss word, stranger + negative word, stranger + neutral word) during a specific interval. \* =  $p < .05$

**Figure 3** Scatterplot of rumination with mean gaze time in ms in the 1500-10000ms interval for a picture of the deceased combined with a loss word



Note. Gaze time is defined as the overall time in seconds spent looking at a picture-word combination during a specific interval.

**Figure 4** Scatterplot of rumination with mean gaze time in ms in the 1500-10000ms interval for a picture of a stranger combined with a negative word



Note. Gaze time is defined as the overall time in seconds spent looking at a picture-word combination during a specific interval.

**Analyses of average fixation times.** In order to analyze the effects of rumination on average fixation times over the whole 10 second interval a second 2x6 analysis of covariance was conducted. For this outcome variable, the overall test for rumination was marginally significant,  $F(6,32) = 2.16, p = .07, \eta^2 = .29$ . The control variables depressive symptoms and complicated grief symptoms showed no significant effects on fixation times,  $F(6,32) = 0.86, p = .53$  and  $F(6,32) = 1.47, p = .22$ , respectively. Given the large effect size in the overall test for rumination, and our relatively small sample size, this effect was examined further by comparing high and low ruminators on average fixation times for each stimulus type. High ruminators, compared to low ruminators, showed a trend for shorter fixation times for pictures of the deceased combined with a loss-related word,  $F(1,37) = 2.02, p = .08, \eta^2 = .05$ . In contrast, high ruminators showed significantly longer fixation times than low ruminators for pictures of a stranger combined with negative words,  $F(1,37) = 6.43, p = .01, \eta^2 = .15$ , or neutral words  $F(1,37) = 4.00, p = .03, \eta^2 = .10$ . No other differences between groups were found for fixation times for other stimuli types. These results corroborate findings on gaze times, and provide additional preliminary support for a link between rumination and loss avoidance. Means and standard errors for average fixation times are shown in Table 3 and are graphically depicted in Figures 5, 6 and 7.

**Additional analyses.** In the analyses described above, the control variables depressive and complicated grief symptoms were added simultaneously to each model. Since symptom levels of depression and complicated grief were highly correlated,  $r(52) = .85, p < .001$ , there may have been content overlap between the two control variables. This suggested that results would be highly similar if we corrected exclusively for one type of distress (depressive symptoms or

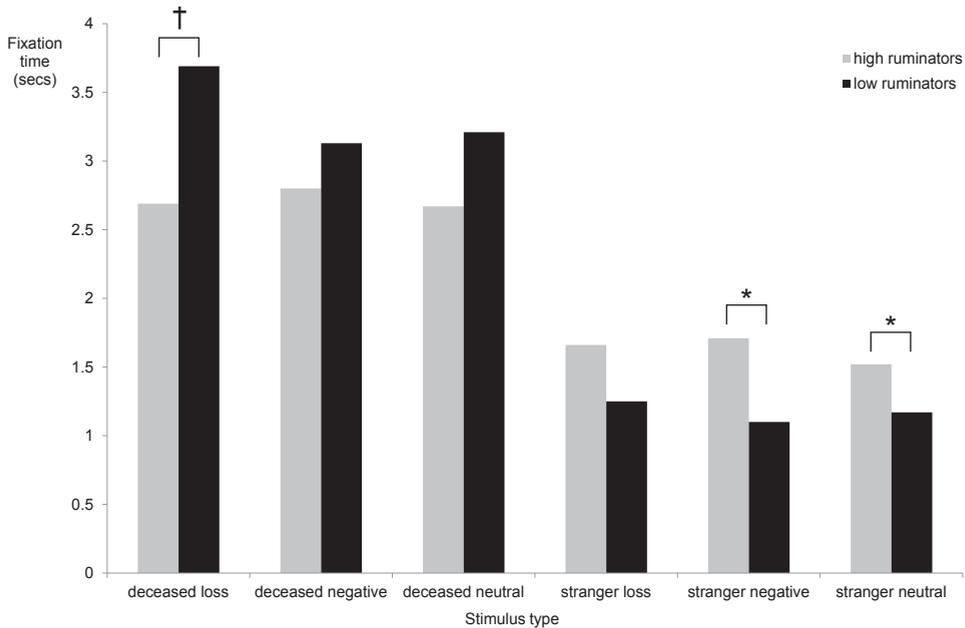
complicated grief symptoms) in our analyses. To test this idea, we conducted the repeated main analyses, using either depressive symptoms or complicated grief symptoms as a control variable. The effects of rumination on the overall test and post-hoc tests on gaze times (1500-10000ms) and fixation time (0-10000ms) were indeed highly similar. Two notable exceptions existed in the models that excluded depressive symptoms as a control variable. First, the overall effect of rumination was significant in the model on fixation time (0-10000ms),  $F(6, 33) = 2.49, p = .04, \eta^2 = .31$ . Second, complicated grief symptom severity was a significant predictor of gaze times (1500-10000ms),  $F(6, 33) = 2.48, p = .04, \eta^2 = .31$ , but yielded no significant post-hoc effects.

**Table 3** Mean fixation times and standard deviations in seconds for each stimulus type during 0-10000ms presentation time.

| Stimulus/<br>Group | Deceased     |             |             | Stranger    |              |              |
|--------------------|--------------|-------------|-------------|-------------|--------------|--------------|
|                    | Loss         | Negative    | Neutral     | Loss        | Negative     | Neutral      |
| High ruminators    | 2.64 (1.09)† | 2.75 (1.34) | 2.67 (1.29) | 1.66 (0.90) | 1.67 (0.84)* | 1.50 (0.66)* |
| Low ruminators     | 3.66 (1.78)† | 3.10 (1.60) | 3.21 (1.79) | 1.23 (0.66) | 1.10 (0.49)* | 1.17 (0.50)* |

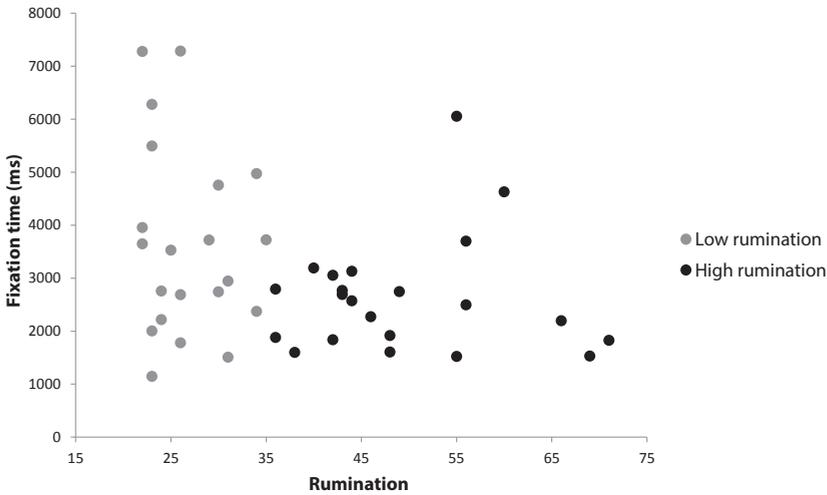
Note. Fixation time is defined as the average time spent looking at a specific stimulus each time one looks at it. \* = significant difference at  $p < .05$  between high ruminators and low ruminators. † = marginally significant difference at  $p < .10$  between high and low ruminators.

**Figure 5** Mean fixation times in seconds for each stimulus type during 0-10000ms presentation time.



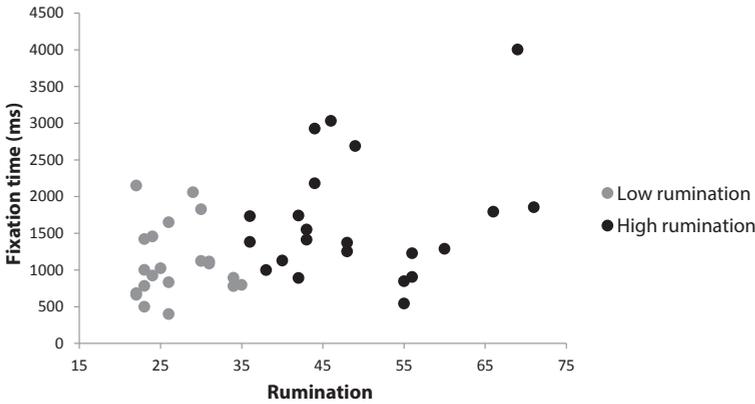
Note. Fixation time is defined as the average time in seconds spent looking at a specific picture-word combination (i.e., deceased + loss word, deceased + negative word, deceased + neutral word, stranger + loss word, stranger + negative word, stranger + neutral word) each time a participant looks at it. \* =  $p < .05$ . † =  $p < .10$

**Figure 6** Scatterplot of rumination with fixation time in ms during 0-10000ms presentation time for a picture of the deceased combined with a loss word



Note. Fixation time is defined as the average time spent looking at a specific stimulus each time one looks at it.

**Figure 7** Scatterplot of rumination with fixation time in ms during 0-10000ms presentation time for a picture of a stranger combined with a negative word



Note. Fixation time is defined as the average time spent looking at a specific stimulus each time one looks at it.

## DISCUSSION

The results observed in this study provided no evidence for the hypothesis that high ruminators, compared to low-ruminators, show stronger initial vigilance and subsequent disengagement for loss-reality stimuli. However, high ruminators showed avoidance of stimuli that represent the

loss on extended exposure durations (1500ms-10000ms). Compared to low ruminators, high ruminators looked less at pictures of the deceased combined with a loss word and more at the picture of a stranger combined with negative or neutral words during this interval. High ruminators also showed a trend to fixate for shorter time periods on pictures of the deceased combined with a loss word than low ruminators. Furthermore, they showed significantly longer average fixation times for pictures of a stranger combined with negative and neutral words than low ruminators. Since analyses were controlled for symptom levels of depression and complicated grief, factors that are associated with attention biases toward negative and loss-related material (Armstrong & Olatunji, 2012; Maccalum & Bryant, 2010), the current results provide the first evidence for an association between rumination levels and a behavioral measure of loss avoidance (cf. Boelen et al., 2006; Stroebe et al., 2007), that cannot be explained by loss-related distress. Effects were mostly medium in size (Cohen, 1988), and are in line with results from survey studies reporting significant linear associations between rumination and cognitive and experiential avoidance in bereaved (Morina, 2011; Eisma et al., 2014) and non-bereaved samples (e.g., Cribb, et al., 2006; Dickson et al., 2012; Giorgio et al., 2010; Liverant et al., 2011; Moulds et al., 2007; Wenzlaff & Luxton, 2003).

Interestingly, findings support the idea that rumination is related to avoidance of personally-relevant threatening material, when less-threatening negative (and neutral) material is simultaneously available. Moreover, no attentional avoidance was found for stimuli that were loss-related, but ambiguous. This supports the hypothesis that rumination may be linked with avoidance of material that unambiguously represents a highly emotional, personally-relevant topic (cf. RAH: Stroebe et al., 2007).

An unexpected finding was that no evidence was found for effects of rumination on attentional biases in the first 1500ms of exposure time, whereas attentional biases were found for exposure times beyond 1500ms. Given the late onset of the observed attention biases, we conclude that rumination potentially contributes to strategic, but not automatic attention processes (Donaldson et al., 2007). It seems logical that avoidance linked with cognitive processing comes into play only after a person consciously perceives a threatening stimulus (i.e., after 1000-1500ms). However, the underlying reason for this null-result may also be methodological. The measurement of attention with eye-tracking for emotional pictorial stimuli has recently been found to show low internal consistency in the first 1500ms of presentation time (Waechter et al., 2014). This may have resulted in increased error variance in the measurement of gaze times in the first presentation intervals (i.e., 0-500ms, 500-1000ms, 1000-1500ms), which has possibly limited our power to detect effects in these intervals.

Some additional remarks about the interpretation of our results are warranted. Apart from differing on loss-relatedness, the pictorial stimuli also differed on familiarity, with the picture of the stranger being more novel than the picture of the deceased. One may argue that this could have influenced the results. For example, high ruminators could have experienced concentration problems during the task (Lyubomirsky, Kasri, & Zehm, 2003), leading them to take more time

to familiarize themselves with the new face presented to them. However, the current pattern of results contradicts a strong bias due to familiarity, as different patterns of attention were found for picture-word combinations, rather than just images. That is, high ruminators, compared to low ruminators, looked less at the picture of the deceased combined with a loss word, but not if this picture was combined with a negative or neutral word. Conversely, high ruminators exhibited increased attention for the picture of a stranger with negative and neutral words, but not for pictures of the stranger with a loss-related word. So, even if familiarity influenced attention, it did not obscure the differential effects of rumination on attention patterns for stimuli types that were predicted beforehand.

Furthermore, although current results support a link between rumination and avoidance after bereavement, it remains to be investigated through which mechanisms rumination and avoidance are linked. Some authors have proposed that rumination is itself an avoidance process (Boelen et al., 2006; Ehlers & Clark, 2000; Liverant et al., 2011; Stroebe et al., 2007), whereas other researchers have argued that rumination has a reciprocal relationship with avoidance (Erber & Wegner, 1996; Nolen-Hoeksema et al., 2008; Wenzlaff & Luxton, 2003). For instance, Nolen-Hoeksema and colleagues (2008) suggested that individuals may attempt to escape from rumination through suppression of negative thoughts. Such suppression logically leads to rebound-effects, making negative thoughts more salient, thereby fuelling ruminative thinking (Erber & Wegner, 1996). However, recently it has been suggested that rumination could serve as the thought content used to suppress more threatening cognitive material (Eisma et al., 2013). While the current results seem more in line with the latter hypothesis, additional studies are needed to test such specific ideas. A potentially interesting line of research could focus on investigating whether ruminative thinking can be used as cognitive content to suppress personally relevant, threatening memories, using a variation on methods used in classical suppression research (Wenzlaff & Wegner, 2000).

Finally, the hypothesis that repetitive thinking (e.g., rumination, worry) is a form of avoidance is not specific to the bereavement area, but has also been presented in research on generalized anxiety disorder (Borkovec et al., 1998; Newman & Llera, 2011), posttraumatic stress disorder (Ehlers & Clark, 2000) and depression (Giorgio et al., 2010). Although surveys quite consistently support associations between repetitive thinking and cognitive and emotional avoidance (e.g., Cribb et al., 2006; Dickson et al., 2012; Eisma et al., 2013; Giorgio et al., 2010; Lee, Orsillo, Roemer, & Allen, 2010; Liverant et al., 2011; Morina, 2011; Moulds et al., 2007; Sexton & Dugas, 2009; Tull, Hahn, Evans, Salters-Pedneault, & Gratz, 2011; Wenzlaff & Luxton, 2003), diverging theories exist regarding what mechanisms underlie an avoidant function of rumination and worry (Borkovec et al., 1998; Eisma et al., 2013; Newman & Llera, 2011). Nevertheless, most theorists agree that repetitive thinking may serve to avoid experiencing strong (changes in) negative emotions. The current study uniquely shows that rumination, perhaps to evade aversive emotional experiences, may also be linked with avoidance of reminders of a stressful life-event. This finding may be of particular importance for research on adjustment to trauma. Researchers have long advocated

the idea that rumination after a traumatic life-event may be cognitive avoidance because it is focused on why the event occurred and 'what if' type questions, rather than on the experience of the trauma as it actually happened. Such avoidance could potentially block integration of the traumatic event with other autobiographical memories, thereby maintaining posttraumatic stress (Ehlers & Clark, 2000). Yet, this assumption has never formally been tested. One direction for future research could therefore be to establish if trauma-related rumination is associated with avoidance of reminders of the trauma in attention tasks, or in other tasks assessing avoidance tendencies (e.g., Rinck & Becker, 2007).

This study also has a number of limitations. First, the sample primarily consists of conjugally bereaved women. This is common in bereavement research, and may reflect both a stronger tendency of women to share their feelings and the overrepresentation of women in widowhood (Stroebe, Stroebe, & Schut, 2001). Although we currently have no reasons to assume that the mechanisms under investigation are different for men and women, a replication of this study in a group of bereaved men is recommended. Second, the sample consisted of people who decided to participate in this study even after they were informed that they would be shown pictures of the deceased, combined with various words. Although effects in this investigation were moderate in size, stronger effects on attentional avoidance may be expected for bereaved individuals who avoid reminders of the loss more structurally. Third, in this study we compared groups low and high on rumination on their attention patterns, but did not manipulate rumination, by giving each group specific instructions to induce ruminative thinking (e.g., Lyubomirsky & Nolen-Hoeksema, 1993). Therefore, the nature of the relationship between rumination and avoidance after bereavement needs to be investigated further to determine causality.

Despite these limitations, this study adds to understanding of the link between rumination and avoidance in bereavement. It is the first study that has supported an association between rumination and a behavioral measure of loss avoidance in a bereaved sample. If future research corroborates and extends these findings, this could have important clinical implications. Specifically, distraction and behavioral activation have traditionally been advocated as methods to decrease rumination, because these techniques lift mood and give people less time to ruminate (Nolen-Hoeksema et al., 2008). However, if avoidance underlies the effects of rumination, exposure or acceptance-based interventions may (also) be effective in breaking the ruminative cycle in bereavement, because they counter avoidance tendencies. In support of this line of reasoning, both exposure therapy for posttraumatic stress disorder and mindfulness-based cognitive therapy for depression have been found effective in reducing rumination and levels of psychopathology (Jain et al., 2007; Wisco, Sloan, & Marx, 2013).

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# Chapter 9

## Rumination And Implicit Avoidance After Loss: An Approach Avoidance Task Investigation

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## ABSTRACT

*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 posttraumatic stress disorder (PTSD), bereavement 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 posttraumatic stress symptom levels, but not when controlling for complicated grief symptom levels.

*Limitations:* Conjurally 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.

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 complicated grief, Boelen and colleagues (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 complicated grief, because it blocks integration of autobiographical memories about the loss with existing autobiographical memories (cf. 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, posttraumatic stress and complicated grief symptoms (e.g., Boelen & van den Hout, 2008; Boelen & van den Bout, 2010; Bonanno, Papa, Lalande, Zhang & Noll, 2005; Eisma et al., 2013; Morina, 2011). For instance, Bonanno and colleagues (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 complicated 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 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., Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999; Michael & Snyder, 2005; 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 and colleagues (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 and colleagues (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 & Cropley, 2013). Potentially, CBT for complicated 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, Garrison-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 and colleagues (2013) extended these findings by demonstrating in a large bereaved sample that the prospective relationship between rumination and complicated 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 and colleagues (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 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 show attentional preference of general negative information (i.e., picture stranger + negative word) on extended presentation times (> 1500ms). Notably, these effects were maintained after correcting for symptoms of complicated 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 posttraumatic 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 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 and colleagues (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 complicated grief).

## METHODS

### 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 et al.,

2014). Rumination scores ranged from 19 to 63 (Mean = 38.4 ; *SD* = 10.0). Sample characteristics are shown in Table 1.

**Table 1** *Sample characteristics (N = 71)*

| <b>Demographic variables</b>                      |             |
|---|-------------|
| Gender (N (Valid %))                              |             |
| Female  | 64 (90.1)   |
| Age in years (M (SD))                             | 50.0 (12.0) |
| <b>Loss-related variables</b>                     |             |
| Gender deceased (N (Valid %))                     |             |
| Female  | 28 (39.4)   |
| Deceased is (N (Valid %))                         |             |
| Partner   | 37 (52.1)   |
| Child   | 7 (9.9)     |
| Parent  | 9 (14.1)    |
| Sibling   | 18 (15.4)   |
| 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)  |
| <b>Psychological variables</b>                    |             |
| Grief rumination (M (SD))                         | 38.4 (10.3) |
| Symptom of depression (M (SD))                    | 17.4 (9.3)  |
| Symptom of posttraumatic stress disorder (M (SD)) | 15.2 (8.1)  |
| Symptoms of complicated grief (M (SD))            | 40.3 (20.3) |

## 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.

## Questionnaires

**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.

**Grief rumination.** The 15-item Utrecht Grief Rumination Scale (UGRS; Eisma 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 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; 2014).

**Symptoms of depression.** We assessed depressive symptoms with the 20-item Center for Epidemiologic Studies Depression Scale (CESD Scale; Radloff, 1977; Beekman, Deeg, Limburg, de Vries, & van Tilburg, 1997). On the CESD Scale respondents indicated how frequently they 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).

**Symptoms of posttraumatic stress.** We measured symptoms of posttraumatic stress disorder (PTSD), using the PTSD Symptom Scale (PSS; Foa, Cashman, Jaycox & Perry, 1997; Engelhard, Arntz, & van den Hout, 2007). 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).

**Symptoms of complicated grief.** Symptoms of complicated grief were assessed with the Inventory of Complicated Grief-Revised (ICG-R; Prigerson & Jacobs, 2001; Boelen, van den Bout, de Keijser, & Hoijtink, 2003). The Dutch version of the ICG-R consists of 29 items measuring complicated 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).

## Approach Avoidance Task

**Stimuli development.** In this investigation, we used previously-developed stimuli (Eisma 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.

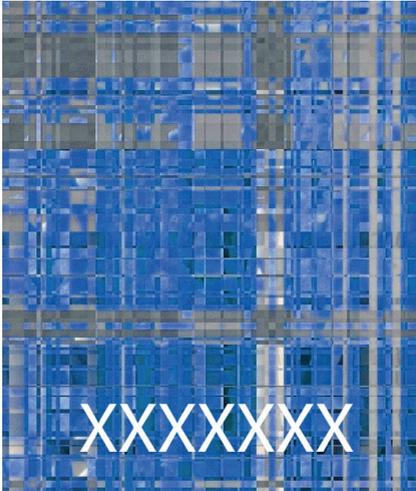
Next, both pictures were combined with loss words and neutral words. All words were matched on word length and word frequency. Loss words were judged to be more loss-related and more negative than neutral words (Eisma et al., 2014). This matching process resulted in four stimuli types (picture deceased + 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 an 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 Figure 1 and Figure 2.

**Figure 1** *Picture of a stranger with a loss-related word.*



*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.

**Figure 2** *Puzzle picture with X's.*

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

**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 x 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 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.

### 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 complicated 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).

## RESULTS

### Preliminary analyses

**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 3500ms 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.

**Background variables and the AAT.** Of all demographic and loss-related variables, only age was significantly related to push-pull scores (cf. Wolkorte et al., 2014), and was therefore used as a control variable in our main analyses.

### Main analyses

**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,  $\beta = -.24$ . 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,  $\Delta F(1, 68) = 0.08, p > .20, \beta = .03, \Delta R^2 = .00$ , and the puzzle picture,  $\Delta F(1, 68) = 0.51, p > .20, \beta = .09, \Delta R^2 = .01$ . 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,  $\Delta F(1, 68) < 0.01, p > .20, \beta = -.01, \Delta R^2 = .00$ , and the picture of a stranger with a loss word,  $\Delta F(1, 68) = 2.20, p = .14, \beta = -.18, \Delta R^2 = .03$ .

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

**Table 2** Multiple regression analyses of rumination predicting push-pull scores of loss stimuli (picture deceased + loss word).

| Predictors                    | $\Delta F$ | $\Delta R^2$ | $\beta$ | $p$ -value |
|-------------------------------|------------|--------------|---------|------------|
| <b>Model 1</b>                |            |              |         |            |
| Age                           | 5.90       | .08          | -.31    | .02        |
| Rumination                    | 4.34       | .06          | -.24    | .04        |
| <b>Model 2</b>                |            |              |         |            |
| Age                           | 5.90       | .08          | -.32    | .02        |
| Depressive symptoms           | 0.64       | .01          | .10     | > .20      |
| Rumination                    | 4.06       | .05          | -.30    | .048       |
| <b>Model 3</b>                |            |              |         |            |
| Age                           | 5.90       | .08          | -.32    | .02        |
| Posttraumatic stress symptoms | 0.11       | .00          | .18     | > .20      |
| Rumination                    | 5.83       | .07          | -.35    | .02        |
| <b>Model 4</b>                |            |              |         |            |
| Age                           | 5.90       | .08          | -.31    | .02        |
| Complicated 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.

## 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 complicated 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 complicated 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 (> 1500ms), even when controlling for symptom levels of depression and complicated grief (Eisma et al., 2014). In the current study, the association between rumination and implicit loss avoidance became insignificant after controlling for complicated 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).

However, another explanation may also account for this result. A power problem could underlie the non-significant association between rumination and implicit loss avoidance, after correcting for complicated 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 posttraumatic stress ( $\Delta R^2 = .05-.07$ ). Yet, after controlling for complicated 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 complicated 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.

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; Eisma et al., 2013; Ehlers & Clark, 2000; Stroebe et al., 2007), whereas others assume rumination has reciprocal relationships with cognitive avoidance (e.g., 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 and colleagues (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 and colleagues (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 et al., 2014; Giorgio et al., 2010). Moreover, results were in line with theories of rumination in posttraumatic stress disorder (Ehlers & Clark, 2000) and complicated grief (Boelen et al., 2006), which state that ruminative coping could serve to avoid reminders of a major negative life-event, possibly 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 our results, 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 reduced rumination (Wisco, Sloan, & Marx, 2013).

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**Intervention**

# **PART 3**



# Chapter 7

## Internet-Based Exposure And Behavioral Activation For Complicated Grief And Rumination: A Randomized Controlled Trial

**Submitted as:**

Eisma, M. C., Boelen, P. A., van den Bout, J., Stroebe, W., Schut H. A. W., Lancee, J., & Stroebe, M. S. Internet-based exposure and behavioral activation for complicated grief and rumination: A randomized controlled trial.

## ABSTRACT

This study examined the effectiveness and feasibility of therapist-guided internet-delivered exposure (EX) and behavioral activation (BA) for complicated grief and rumination. Forty-seven bereaved individuals with elevated levels of complicated grief and grief rumination were randomly assigned into three conditions: EX ( $N = 18$ ), BA ( $N = 17$ ), or a waiting-list ( $N = 12$ ). Treatment groups received 6 homework assignments over 6-8 weeks. Intention-to-treat analyses showed that EX reduced levels of complicated grief, posttraumatic stress, depression, grief rumination and brooding relative to the control group at post-treatment ( $d = 0.7-1.2$ ). BA lowered levels of complicated grief, posttraumatic stress and grief rumination at post-treatment ( $d = 0.8-0.9$ ). At follow-up, effects of EX were maintained on complicated grief and grief rumination ( $d = 0.6-1.2$ ), and for BA on complicated grief, posttraumatic stress and grief rumination ( $d = 0.8-0.9$ ). Completers analyses corroborated the results for EX, but not for BA. BA suffered from high dropout (59%), relative to EX (33%) and the waiting-list (17%). Due to power limitations, we could make no comparisons between treatment conditions. Feasibility ratings appeared higher for EX than BA. Results supported the potential applicability of online exposure, but not online behavioral activation to decrease complicated grief and rumination levels.

Although most persons adapt to the death of a loved one without therapeutic intervention, a significant minority of bereaved individuals experiences severe physical and mental health problems (Stroebe, Schut, & Stroebe, 2007). In approximately 5-10% of bereaved people, a loss results in persistent emotional difficulties, such as posttraumatic stress disorder (PTSD), and major depressive disorder (MDD) or complicated grief. Over the past years, several scientists have attempted to define mental disorders that are characterized by chronic grief responses (Horowitz et al., 1997; Maercker et al., 2013; Prigerson et al., 2009). An influential proposal is prolonged grief disorder (PGD), which is characterized by persistent separation distress, difficulty accepting the loss and adjusting to its consequences, present to a distressing and disabling degree at least six months after the death occurred (Prigerson et al., 2009). Given the large individual differences in the outcomes of experiencing a loss, it is imperative to establish which types of treatment reduce loss-related mental health problems.

Several reviews and meta-analyses have shown that universal treatments for bereaved individuals are generally ineffective, but that therapeutic interventions for indicated groups (e.g., people manifesting elevated levels of loss-related distress) are efficacious in reducing levels of mental health complaints (e.g., Currier, Neimeyer, & Berman, 2008; Mancini, Griffin, & Bonanno, 2012; Schut, Stroebe, van den Bout, & Terhegge, 2001). Accordingly, psychological treatments for complicated grief were found to be effective, yielding moderate effect sizes in a recent meta-analysis (Wittouck, van Autreve, de Jaegere, Portzky, & van Heeringen, 2011). Moreover there is accumulating evidence that cognitive behavioral therapy (CBT) is a promising therapeutic intervention for complicated grief (Boelen, de Keijser, van den Hout, & van den Bout, 2007; Papa, Sewell, Garisson-Diehn, & Rummel, 2013a; Rosner, Pfoh, Kotoučová, & Hagl, 2014; Shear, Frank, Houck, & Reynolds, 2005; Wagner, Knaevelsrud, & Maercker, 2006). CBT for complicated grief typically consists of multiple components, including, but not limited to: i) exposure to avoided bereavement cues, ii) cognitive restructuring of loss-related negative cognitions, and/or iii) behavioral activation to counter inactivity and behavioral withdrawal.

Despite the proven effectiveness for CBT in reducing loss-related distress, little is known about the potential of online applications of this approach. This is somewhat surprising, because online therapy has been shown to be equally effective as face-to-face therapy for various affective disorders (e.g., Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). Moreover, internet-delivered therapy could provide an easily accessible, cost-effective and time-efficient way of providing help to bereaved individuals who have difficulty adjusting to their loss. Since governments and insurance companies increasingly stress the need for brief, evidence-based interventions to reduce mental health complaints, the development of these online interventions is important.

The limited research on online CBT interventions for bereaved individuals that has been done so far, provides a mixed picture. For example, therapist-guided internet-delivered CBT for complicated grief was effective in reducing loss-related distress (Wagner et al., 2006), but an unguided online CBT-based writing intervention for a general bereaved population was not (van der Houwen, Stroebe, Schut, Stroebe, & van den Bout, 2010). These findings suggest that

in addition to targeting indicated groups of bereaved persons (for reviews: Currier et al., 2008; Wagner, 2013), some degree of therapist support is necessary to make online therapy optimally effective (for reviews: Andersson, Carlbring, Berger, Almlöv, & Cuijpers, 2009; Wagner, 2013). In the current study, we therefore set out to further investigate the effectiveness of therapist-supported online therapy for people with elevated levels of complicated grief.

Another issue that has been given scant attention in research on CBT for bereaved persons, is the effectiveness of individual treatment components. Given the need for cost-effective and time-efficient therapies, it is worth investigating whether beneficial effects on levels of loss-related distress can be attained through application of a single treatment component instead of a combination of multiple modules. This is especially relevant given that a recent large meta-analysis showed that dismantled treatments, consisting of single modules, generally yield similar results as full treatments (Bell, Marcus, & Goodlad, 2013). A rare study that did investigate the effectiveness of separate components of CBT for complicated grief yielded some interesting findings. Boelen and colleagues (2007) compared the effects of three conditions. In the first condition, a 6-week exposure module was followed by a 6-week cognitive restructuring module. In the second condition, the sequence of modules was reversed, and in the third condition, a 12-week supportive counseling was provided. Interestingly, both exposure and cognitive restructuring yielded moderate to large reductions in symptoms of complicated grief after only 6 weeks. However, the design of this study did not permit examination of long-term effects of these treatment components. Clearly, it is important to investigate what the effects of individual treatment modules are, as this could be a way to develop shorter and more efficient treatments for bereaved individuals experiencing grief complications.

In addition, it is still relatively unclear what mechanisms underlie the effects of CBT for complicated grief, as reports of controlled trials generally focus on establishing if therapy affects symptom measures, rather than on risk or protective factors relating to bereavement outcome. A notable exception is a recent secondary analysis of a randomized controlled trial which showed that reductions in complicated grief during CBT were associated with reductions in negative loss-related cognitions and avoidance behavior (Boelen, de Keijser, van den Hout, & van den Bout, 2011). Another analysis showed that online CBT, apart from reducing complicated grief and depression, also increased posttraumatic growth, but not optimism (Wagner, Knaevelsrud, & Maercker, 2007). An extension of this research, focusing on how CBT affects coping styles that intensify or reduce mental health problems after bereavement, can provide insights into the working mechanisms of such therapies, which can be used to increase the effectiveness of existing psychotherapeutic interventions.

Therefore, in the current investigation, we sought to complement prior studies, by testing two brief, therapist-supported, internet-delivered therapy modules in a sample of bereaved persons with elevated levels of complicated grief. We chose to examine the effects of exposure and behavioral activation, for a number of reasons. A first reason was that both interventions are based on a clear conceptual basis. Exposure is grounded in the notion that individuals

experiencing complications in their grieving process avoid reminders of the painful reality of the loss, for instance by avoiding places, objects or situations, or by engaging in cognitive avoidance strategies such as suppression (e.g., Boelen & van den Bout, 2010; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Eisma et al., 2013). Such avoidance strategies are hypothesized to block integration of the loss in the autobiographical knowledge base (Boelen, van den Hout, & van den Bout, 2006), and/or acceptance of the loss (Stroebe et al., 2007; Worden, 2009). Therefore, systematically confronting a bereaved person with the most painful aspects of the reality of the loss, could increase acceptance of the loss and facilitate adjustment to bereavement. Behavioral activation, on the other hand, is founded on the observation that individuals experiencing grief complications become more inactive and withdraw from social, occupational and recreational activities (Boelen et al., 2006; Boelen & van den Bout, 2010; Eisma et al., 2013). This results in reduced opportunities to challenge negative cognitions that are common after loss, which fuels negative feelings and grief complications. Therefore, it is proposed that encouraging bereaved individuals to engage in activities perceived to be both meaningful and important, can disconfirm negative cognitions and increase positive mood, thereby reducing pathological grief responses.

Another, related reason to study exposure and behavioral activation is that there is some evidence for the effectiveness of both techniques to reduce post-loss psychopathology. As mentioned, exposure is an integral part of many effective contemporary CBT interventions (e.g., Boelen et al., 2007; Shear et al., 2005; Wagner et al., 2006). Behavioral activation has not yet been studied frequently in bereavement, but was proposed to be an important add-on element to existing CBT interventions for complicated grief (Shear, Boelen, & Neimeyer, 2011). Recently, a pilot randomized trial showed that behavioral activation could potentially be as effective as a stand-alone therapy for complicated grief. Relative to a waiting list control group, behavioral activation caused large reductions in depression, posttraumatic stress and complicated grief symptoms (Papa, Sewell, Garrison-Diehn, & Rummel, 2013a).

A third important reason for studying exposure and behavioral activation, is that both techniques are a potentially effective way to reduce rumination. Rumination, thinking repetitively and recurrently about the causes and consequences of a loss and loss-related emotions, is a risk factor that predicts increases in mental health problems after bereavement (for reviews: Eisma et al., 2014a; Nolen-Hoeksema, 2001). Traditionally, behavioral activation has been advocated as a method to reduce rumination, because it diverts attention away from ruminative thinking, and increases positive thoughts and feelings (e.g., Martell, Addis & Johnson, 2001; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). A recent study showed rumination and behavioral withdrawal after loss are indeed related (Eisma et al., 2013). Furthermore, two case studies of bereaved individuals who took part in behavioral activation therapy showed reductions in rumination after treatment and at 3 and 6 month follow-up (Papa, Rummel, Garrison-Diehn, & Sewell, 2013b).

Exposure therapy has been suggested to ameliorate rumination, because it reduces avoidance behavior. Several grief researchers have hypothesized rumination after bereavement

serves as a way to avoid painful aspects of the reality of the loss (Boelen et al., 2006; Eisma et al., 2013; Stroebe et al., 2007). Studies in bereaved samples have confirmed a cross-sectional and prospective association between rumination and cognitive and/or emotional avoidance (e.g., Morina, 2011; Eisma et al., 2013). Moreover, in an eye-tracking study in bereaved individuals, high ruminators, compared to low ruminators, engaged in more attentional avoidance of reminders of the loss (Eisma et al., 2014b). If rumination is indeed a cognitive avoidance strategy, exposure techniques would be a viable way to reduce rumination. Thus, the study of the effects of exposure therapy and behavioral activation provide us with an opportunity to enhance knowledge about the potential working mechanisms of rumination after loss.

In the current investigation, we compared the effects of a brief internet-based exposure and brief internet-based behavioral activation module against a waiting-list control group in a bereaved sample with elevated levels of complicated grief and rumination. We made no differential predictions with regard to the relative effectiveness of each intervention, as therapy based on either method yielded large and highly similar effect sizes in previous research (e.g., Papa et al., 2013a; Wagner et al., 2006) and our current sample size was too small to detect potential small differences between treatment groups (see Method). Our first hypothesis was that we predicted that exposure and behavioral activation would both reduce symptom levels of complicated grief compared to the control group, at post-treatment and at 3-month follow-up. Second, we expected that each module would significantly reduce grief rumination, compared to the control group, after treatment and at 3-month follow-up. Additionally, we predicted that both interventions would be effective in reducing symptom levels of other types of psychopathology (i.e., posttraumatic stress, depression, anxiety) and depressive rumination (i.e., brooding and reflection; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). We also assessed the feasibility of each intervention.

## **METHOD**

### **Study design**

Ethical approval for the present study was provided by an official Dutch Ethical Review Board. Participants were recruited through advertisements on websites and Facebook pages of organizations for bereaved individuals, and on the content network of Google from May 2013 through January 2014. People who were interested in participation could link through to a website specifically designed for the current project. On this website they could read general information about the study (e.g., on goals of the study, data handling, privacy, anonymity, etc.), fill out a screening questionnaire and provide contact information. People were eligible for participation if they had lost a first-degree relative more than six months ago (cf. Prigerson et al., 2009), and reported elevated levels of complicated grief (i.e., a score > 25) on the Inventory of Complicated Grief (ICG; cf. Prigerson et al., 1995) and elevated grief rumination (i.e., a score > 40) on the Utrecht Grief Rumination Scale (UGRS; Eisma et al., 2014a). Additionally, participants

should comprehend Dutch, have private access to a computer, and the ability to conduct basic computer tasks (e.g., e-mailing, using MS Word). Exclusion criteria were: current suicidal plans (i.e., people with mild suicidal ideation were not excluded); past or current psychosis or schizophrenia, and past or current episodes of dissociation or dissociative disorder (cf. Wagner, 2013).

People who met our criteria were sent a personalized information letter and an informed consent form by e-mail and by post. Individuals who were still interested in participation after reading the information letter, were asked to e-mail the researcher in charge of the execution of the study within two weeks. After indicating interest in the study by e-mail, a person was called by phone for an intake interview. During this intake interview in- and exclusion criteria were checked again, potential participants could ask questions about the study and detailed information about practical issues was given. Individuals who wished to participate after the intake procedure were requested to fill out the informed consent form and to return it by post. Each participant was randomized (simple randomization) in one of our three conditions with a ratio of 3 (exposure): 3 (behavioral activation) : 2 (waiting list) (cf. Boelen et al., 2007). The participants in all groups were offered a possibility to enter one of the online or face-to-face treatments after completing the participation in our study.

## Participants

In total, 433 persons started filling out the online screening questionnaire. Of this group, 114 individuals were potentially eligible for participation (and were sent more information). Forty-seven persons were finally allocated to one of three conditions. Table 1 shows the baseline characteristics of this final sample (for group comparisons see Results). Figure 1 shows a flowchart of participants.

## Treatment conditions

Each treatment consisted of 6 manual-based e-mailed homework assignments, which were completed over a period of 6 to 8 weeks. Each homework assignment could be completed in one week. After each assignment, the therapist provided feedback. Primarily, this feedback was aimed at optimizing treatment efficacy, by further explaining homework and maximizing treatment adherence. For example, when necessary, the therapist would explain more about the goal of an assignment and what is the best way to execute it. In total, the therapist spent a maximum of one hour per week on sending assignments and giving feedback.

**Exposure.** Exposure is based on the idea that avoidance of reminders of painful aspects of the loss is a central maintaining in the development and maintenance of complicated grief. This treatment is focused on reducing such avoidance behavior by gradually exposing individuals to the most aversive aspects of the loss. Our exposure protocol was based on the protocol used by Boelen and colleagues (2007), and was adapted for online administration. In the first week of treatment, individuals received a detailed rationale of exposure therapy. As a first homework assignment, participants were asked to list situations, objects, or memories related to the loss

that they tended to avoid in daily life. Furthermore, they were requested to list any behavior that they recurrently engage in to maintain the bond with the deceased. In the subsequent homework sessions, participants were encouraged to gradually expose themselves to those aspects of the loss that they tended to avoid most, or, alternatively, to gradually reduce excessive behavior which maintained the bond with the deceased. This was achieved by engaging in a combination of writing assignments and imaginal and/or in-vivo exposure exercises.

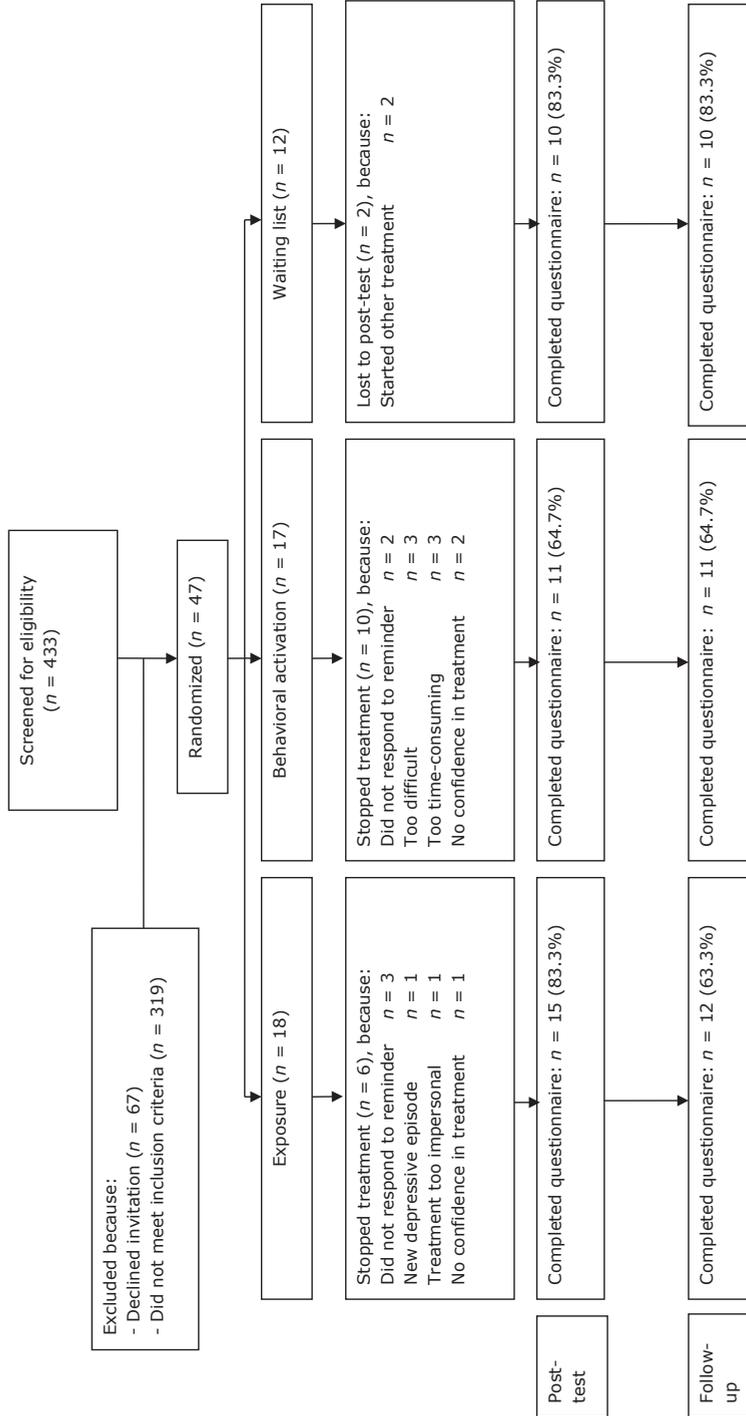
**Behavioral activation.** Behavioral activation is based on the idea that avoidance of activities that could foster positive mood, is a maintaining factor in complicated grief. This intervention is aimed at increasing the number of meaningful and fulfilling activities that individuals undertake. Our protocol was based on the brief behavioral activation for depression protocol developed by Lejuez, Hopko, Acierno, Daughters and Potago (2011). This protocol was shortened and adjusted to be more suitable for online administration in a bereaved population. In the first week, participants received a detailed rationale for this form of therapy. As a first homework assignment, they were requested to keep a 7-day activity diary, in which they indicated how pleasurable and important they found the activities they undertook during these days. In the subsequent homework assignments, participants were encouraged to continue keeping a diary, identify their core values, and to develop new meaningful and pleasurable activities based on these values. Ultimately, the goal of the intervention was to gradually engage in more of these value-based activities, whilst reducing the number of activities that were experienced as unimportant and unfulfilling.

**Table 1** *Sample characteristics*

|                                     | <b>Exposure<br/>N = 18</b> | <b>Activation<br/>N = 17</b> | <b>Control<br/>N = 12</b> | <b>Total<br/>N = 47</b> |
|-------------------------------------|----------------------------|------------------------------|---------------------------|-------------------------|
| <b>Demographic characteristics</b>  |                            |                              |                           |                         |
| Gender (N (%))                      |                            |                              |                           |                         |
| Female                              | 15 (83.3)                  | 16 (94.1)                    | 12 (100.0)                | 43 (91.5)               |
| Age in years (M (SD))               | 49.9 (10.8)                | 44.4 (13.8)                  | 41.3 (14.6)               | 45.7 (12.9)             |
| Education level (N (%))             |                            |                              |                           |                         |
| Lower education                     | 5 (27.8)                   | 7 (41.2)                     | 7 (58.3)                  | 19 (40.4)               |
| Higher education                    | 13 (72.2)                  | 10 (58.8)                    | 5 (41.7)                  | 28 (59.6)               |
| <b>Loss-related characteristics</b> |                            |                              |                           |                         |
| Deceased is (N (%))                 |                            |                              |                           |                         |
| Partner                             | 9 (50.0)                   | 6 (35.3)                     | 4 (33.3)                  | 19 (40.4)               |
| Other                               | 9 (50.0)                   | 11 (64.7)                    | 8 (66.7)                  | 28 (59.6)               |
| Cause of loss (N (%))               |                            |                              |                           |                         |
| Non-violent                         | 14 (77.8)                  | 15 (88.2)                    | 8 (66.7)                  | 37 (78.7)               |
| Violent                             | 4 (22.2)                   | 2 (11.8)                     | 4 (33.3)                  | 10 (22.8)               |
| Time since loss (M (SD))            | 26.0 (13.0)                | 32.4 (47.8)                  | 24.4 (12.2)               | 31.0 (45.1)             |

Note. Lower education = primary school, high school or vocational school. Higher education = college or university. Other = child, sibling or parent.

Figure 1 Flowchart



## Therapists and treatment adherence

Therapy was administered by two licensed clinical psychologists, with post-master training in CBT. For the purpose of the study, they received an additional two-day training in internet-delivered exposure therapy and behavioral activation for complicated grief. Each therapist delivered both types of therapy. Therapies were described in detailed session-by-session protocols to maintain treatment fidelity. In addition, regular peer-to-peer coaching and supervision meetings were held to ensure protocol adherence.

## Instruments

Questionnaires were administered at four time-points. First, in the screening questionnaire, we assessed demographic and loss-related variables and assessed current levels of complicated grief symptoms and grief-related rumination. At pre, post and 3-month follow-up measurement we assessed symptom levels of depression, anxiety, posttraumatic stress, and complicated grief and grief rumination and depressive rumination (i.e., brooding, reflection). Additionally, at post-measurement, a questionnaire on the feasibility of treatment was administered in the treatment groups, but not in the control group. Each measurement instrument is described below.

**Demographic and loss-related variables.** A self-constructed questionnaire was used to assess demographic variables (i.e., age, gender, education level) and loss-related variables (i.e., time since loss, gender deceased, kinship, cause of death, expectedness of the loss) and inclusion and exclusion criteria (e.g., suicidal plans, established psychiatric diagnoses, computer access, computer skills).

**Complicated grief symptoms.** Symptoms of complicated grief were assessed with the Inventory of Complicated Grief-Revised (ICG-R; Prigerson & Jacobs, 2001; Dutch version: Boelen, van den Bout, de Keijser, & Hoijtink, 2003). The Dutch ICG-R consists of 29 items measuring complicated grief symptoms. Participants could indicate how frequently they had experienced these symptoms during the past month on a five-point scale ranging from 0 (*almost never*) to 4 (*always*). Studies in subclinical samples of bereaved individuals supported the reliability and validity of the ICG-R (Boelen et al., 2003). Notably, our cutoff-score for participation (>25) was calculated by summing 19 items from the original Inventory of Complicated Grief (ICG; Prigerson et al., 1995), which are included in the ICG-R.

**Posttraumatic stress symptoms.** We assessed posttraumatic stress disorder (PTSD) symptoms, using the PTSD Symptom Scale (PSS; Foa, Cashman, Jaycox, & Perry, 1997; Dutch version: Engelhard, Arntz, & van den Hout, 2007). The PSS consists of 17 statements about PTSD symptoms, based on the DSM-IV PTSD criteria (APA, 2000). Participants indicated how frequently they experienced each symptom in response to the loss during the past month, on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*almost always*). The PSS showed good reliability and acceptable validity in a sample with a heterogeneous trauma history (Engelhard et al., 2007).

**Anxiety and depressive symptoms.** Symptoms of anxiety and depression were measured with the Hospital Anxiety and Depression Scale (HADS: Zigmond & Snaith, 1983; Dutch version: Spinhoven et al., 1997). The HADS consists of 7 statements that tap anxious symptoms and 7 statements that tap depressive symptoms. Participants indicated how often / to what extent they have experienced these symptoms in the past week on 4-point scales. The reliability and validity of the HADS has been demonstrated in several large Dutch samples, including community samples (Spinhoven et al., 1997).

**Grief rumination.** The 15-item Utrecht Grief Rumination Scale (UGRS: Eisma et al., 2014) was used to measure grief-related rumination, recurrent and repetitive thinking about the causes and consequences of the loss and loss-related emotions. 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 ask yourself what you have done to deserve this?", and: "How often in the past month did you try to understand 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; 2014a).

**Depressive rumination.** We used the Ruminative Response Scale (RRS: Nolen-Hoeksema & Morrow 1991; Dutch version: Schoofs, Hermans, & Raes, 2010) to measure depressive rumination. Two 5-item subscales of the RRS, hypothesized to show no content overlap with depression, the 'brooding' and 'reflection subscale, were used (Treynor et al. 2003). Respondents indicated how often they exhibited certain behavior when they feel sad, blue or depressed on a 4-point scale, ranging from almost 1 (*never*) to 4 (*almost always*). A sample item of the brooding scale is: "I think: Why do I always react this way?" A sample item of the reflection subscale is: "I analyze recent events to understand why I feel depressed." The reliability and validity of the Dutch RRS brooding and reflection subscales was supported by research in nonclinical samples (Schoofs et al., 2010).

**Feasibility.** Feasibility of treatment was assessed by 6 statements about the comprehensibility of instructions and homework assignments, the extent to which one felt understood by the therapist, and general feasibility, usefulness of the treatment and satisfaction with the treatment. Each participant indicated the extent to which they agreed with each statement (sample item: "I felt my therapist understood me"), on a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*) (cf. Spuij, van Londen-Huijberts, & Boelen, 2013).

## Power analyses

A conservative power analysis ( $d = 0.5$ , power = 0.80) showed 98 participants were needed to detect Time x Group interaction effects in a repeated-measures MANOVA with three groups across two time-points. Due to practical problems, our present sample was much smaller than originally planned ( $n = 47$ , intention-to-treat/  $n = 29$ , completers). Therefore, we decided to conduct repeated-measures ANOVA's instead of repeated-measures MANOVA's. In the completers analyses, we had a power of 0.80 to detect an interaction effects of  $d = 0.65$  when comparing

the exposure versus the control group and effects of  $d = 0.75$  when comparing the behavioral activation versus the control group.

### Statistical analyses

As our power analyses show, we could not execute the analyses we initially aimed to do. Since previous research yielded comparable effects of behavioral activation and exposure-based treatments (e.g., Wagner et al., 2007; Papa et al., 2013a), we would not be able to detect these differences by comparing the treatment groups with one another. Therefore, to limit the overall number of analyses, we exclusively compared each treatment group against the control group.

For our intention-to-treat analyses, we conducted multilevel regression analyses including time (pre-measurement vs. post-measurement or pre-measurement vs. follow up), group (exposure vs. control or behavioral activation vs. control) and time x group interactions as predictors of levels of psychopathology (i.e., complicated grief, posttraumatic stress disorder, depression, anxiety) and levels of rumination (i.e., grief rumination, brooding, reflection). Multilevel regression analysis is an intention-to-treat procedure that allows participants with only one measurement moment in the analyses (Hox, 2002). Little (1995) has shown that multilevel shows unbiased estimates when the panel attrition follows a pattern of missing at random (MAR). This approach is superior to traditional methods of dealing with dropout in treatment designs, such as last observation carried forward, as these may lead to biased estimates, and in some cases result in a bias in favor of the alternative hypothesis (Streiner, 2008). All multilevel regression analyses were conducted with MLwiN 2.24.

In addition to intention-to-treat analyses we also conducted completers analyses, including only participants who had completed at least 4 out of 6 homework assignments, which we regarded as having received an adequate 'dose' of treatment. Completers analyses were conducted with repeated-measures ANOVA's. These analyses and all other analyses in this manuscript were conducted with the SPSS 20.0.

Cohen's  $d$ 's were calculated as a measure of effect size for all dependent variables on the completers data. Within group Cohen's  $d$ 's were calculated by deducting the mean score on a dependent variable on post-measurement (or follow-up) from the mean score at pre-measurement, divided by the pooled standard deviation, for each group. Between group Cohen's  $d$ 's were computed by dividing the difference in change scores of groups across time by the pooled standard deviation of both groups at baseline (Morris, 2008). Cohen (1988) considered an effect of 0.2 to be small, an effect of 0.5 to be medium and an effect of 0.8 to be large. We used a two-sided  $p$ -value ( $p < .05$ ) for all analyses. Main analyses were corrected for baseline differences between each treatment group and the control group.

## RESULTS

### Preliminary analyses

**Randomization check.** Before conducting the main analyses, we performed a randomization check by comparing all groups at baseline on all variables using Chi-square tests and ANOVA's. No baseline group differences were found on demographic and loss-related variables, or on levels of complicated grief, posttraumatic stress, anxiety, grief rumination and reflection. However, we did find significant baseline differences between groups on depressive symptoms,  $F(2, 44) = 3.49, p = .04$ , and brooding,  $F(2, 44) = 5.26, p = .01$ . Post-hoc tests revealed that the behavioral activation group scored higher on depressive symptoms,  $t(27) = 2.44, p = .02$ , and brooding,  $t(27) = 2.96, p = .01$ , than the control group. These variables were therefore used as covariates in the main analyses comparing behavioral activation and the control group.

**Dropout and nonresponse.** If participants in the treatment groups completed less than 4 homework assignments, they were regarded as dropouts. In total, a notable 10 out of 17 participants (58.8%) dropped out during treatment in the behavioral activation group, and 6 out of 18 (33.3%) in the exposure group. Figure 1 shows the flowchart with reasons for dropout. Nonresponse rates were as follows: Three out of 18 participants (16.7%) in the exposure condition did not complete the post-test, and 6 (33.3%) did not complete the follow-up. Six out of 17 participants (35.3%) in the behavioral activation condition and 2 out of 12 participants (16.7%) in the waiting-list condition did not fill out post-measurement and follow-up questionnaires. We found no differences between completers and dropouts on demographic and loss-related variables, or symptom and rumination levels. However, dropout did appear higher in the behavioral activation group, and a chi-square test indicated a marginally significant group difference on dropout,  $\chi^2(2) = 3.95, p = .07$ .

**Feasibility.** All participants who filled out the post-measurement were included in our feasibility analysis, that is, 15 people from the exposure group (12 completers) and 11 people from the behavioral activation group (7 completers). Participants in the exposure condition indicated that they understood the study information (Mean = 4.67,  $SD = 0.60$ , agree/strongly agree = 93.3%) and homework assignments (Mean = 4.67,  $SD = 0.48$ , agree/strongly agree = 100.0%). They also reported that their therapist understood them (Mean = 4.36,  $SD = 0.63$ , agree/strongly agree = 92.9%). Finally, a majority of participants agreed that the treatment was useful (Mean = 4.00,  $SD = 1.17$ , agree/strongly agree = 64.3%), feasible (Mean = 4.21,  $SD = 1.05$ , agree/strongly agree = 85.7%), and satisfactory (Mean = 3.86,  $SD = 0.95$ , agree/strongly agree = 64.3%). Behavioral activation participants also reported that they understood study information (Mean = 4.64,  $SD = 0.51$ , agree/strongly agree = 100.0%) and homework assignments (Mean = 4.27,  $SD = 0.78$ , agree/strongly agree = 81.8%). They also indicated that their therapist understood them (Mean = 4.13,  $SD = 0.94$ , agree/strongly agree = 81.8%). However, people in the behavioral activation group did not consistently agree with the statements that the treatment was useful, feasible and satisfactory

(all Means = 3.64, *SD*'s = 1.21, agree/strongly agree = 45.5%, 63.6%, 45.5%, respectively). This is noteworthy, particularly in the light of the fact that 6 participants from the behavioral activation group were not included in these analyses, 4 of whom discontinued treatment because they found the assignments too difficult or time-consuming (see Figure 1).

## Main analyses

**Intention-to-treat analyses.** Table 2 and 3 show the intention-to-treat multilevel regression analyses on the data from all participants who were initially allocated to one of our three groups. Table 4 and 5 show the observed means and standard deviations and corresponding within and between group effect sizes.

**Treatment effects for exposure therapy at post-test and follow-up.** At post-measurement, between group interaction effects (Time x Group) showed that exposure reduced symptoms of complicated grief ( $p = .02$ ,  $d = 0.8$ ) posttraumatic stress ( $p = .003$ ,  $d = 1.0$ ) and depression ( $p = .03$ ,  $d = 0.7$ ), and levels of grief rumination ( $p = .02$ ,  $d = 1.2$ ) and depressive brooding ( $p < .001$ ,  $d = 1.0$ ), compared to the control group. No significant interaction effects were found for anxiety ( $p = .06$ ,  $d = 0.4$ ) and depressive reflection ( $p = .25$ ,  $d = 0.3$ ).

At follow-up measurement, between group interaction effects (Time x Group) showed that treatment effects of exposure therapy were maintained for complicated grief symptoms ( $p = .048$ ,  $d = 0.6$ ) and grief rumination ( $p = .003$ ,  $d = 1.2$ ). Additionally, a significant interaction effect was found on depressive reflection ( $p = .02$ ,  $d = 0.8$ ). However, no significant effects emerged for levels of posttraumatic stress ( $p = .16$ ,  $d = 0.5$ ), depression ( $p = .27$ ,  $d = 0.2$ ), anxiety ( $p = .20$ ,  $d = 0.4$ ) and depressive brooding ( $p = .056$ ,  $d = 0.7$ ).

**Treatment effects for behavioral activation at post-test and follow-up.** Behavioral activation showed significant between group interaction effects (Time x Group) for symptom levels of complicated grief ( $p = .008$ ,  $d = 0.9$ ) and posttraumatic stress disorder ( $p = .003$ ,  $d = 0.8$ ), and for grief rumination ( $p = .01$ ,  $d = 0.8$ ) and depressive reflection ( $p = .03$ ,  $d = 0.5$ ). However, behavioral activation did not ameliorate depression ( $p = .57$ ,  $d = 0.3$ ), anxiety ( $p = .08$ ,  $d = 0.5$ ) or depressive brooding ( $p = .29$ ,  $d = 0.8$ ).

Effects for behavioral activation were maintained at follow-up for symptoms of complicated grief ( $p = .003$ ,  $d = 0.9$ ) and posttraumatic stress disorder ( $p = .02$ ,  $d = 0.8$ ) and grief rumination levels ( $p = .003$ ,  $d = 0.9$ ). No significant interaction effects were found for symptom levels of depression ( $p = .40$ ,  $d = -0.2$ ) and anxiety ( $p = .10$ ,  $d = 0.5$ ), and depressive reflection ( $p = .07$ ,  $d = 0.6$ ) and depressive brooding ( $p = .29$ ,  $d = 0.3$ ).

**Table 2** Multilevel regression intention-to-treat analyses: time and interaction effects (time x group) at post-measurement (Model 1) and three month follow-up (Model 2) exposure versus control group.

|                   | CG     |          | PTSD  |          | Depression |          | Anxiety |          | Grief rumination |          | Brooding |          | Reflection |          |
|-------------------|--------|----------|-------|----------|------------|----------|---------|----------|------------------|----------|----------|----------|------------|----------|
|                   | b      | (SE)     | b     | (SE)     | b          | (SE)     | b       | (SE)     | b                | (SE)     | b        | (SE)     | b          | (SE)     |
| <b>Model 1</b>    |        |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| <u>Within</u>     |        |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Constant          | 57.17  | (5.23)** | 37.67 | (2.13)** | 8.75       | (1.31)** | 11.00   | (1.11)** | 43.5             | (2.56)** | 9.83     | (0.83)** | 9.08       | (0.79)** |
| Time (T1 vs. T2)  | 1.99   | (4.69)   | 1.85  | (1.88)   | 0.11       | (1.09)   | 0.274   | (0.87)   | 0.56             | (3.05)   | 1.40     | (0.70)*  | 0.02       | (0.77)   |
| <u>Between</u>    |        |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Group (Ex vs. Co) | 5.11   | (6.76)   | -0.33 | (2.75)   | 2.36       | (1.69)   | -0.06   | (1.43)   | 2.61             | (3.31)   | 1.44     | (1.08)   | 1.92       | (1.01)   |
| Group x Time      | -14.42 | (6.06)*  | -7.18 | (2.43)** | -3.20      | (1.41)*  | -2.10   | (1.12)†  | -9.59            | (3.94)*  | -3.02    | (0.90)** | -1.16      | (1.00)   |
| <b>Model 2</b>    |        |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| <u>Within</u>     |        |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Constant          | 57.16  | (5.15)** | 37.67 | (2.12)** | 8.75       | (1.27)** | 11.00   | (1.17)** | 43.5             | (2.29)** | 9.83     | (0.78)** | 9.08       | (0.75)** |
| Time (T1 vs. T3)  | -2.20  | (2.31)   | -1.35 | (1.05)   | -1.17      | (0.46)*  | -0.56   | (0.50)   | -2.08            | (1.19)   | -0.33    | (0.42)   | 0.30       | (0.40)   |
| <u>Between</u>    |        |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Group (Ex vs. Co) | 5.11   | (6.65)   | -0.33 | (2.74)   | 2.36       | (1.64)   | -0.06   | (1.51)   | 2.61             | (2.97)   | 1.44     | (1.01)   | 1.92       | (0.96)   |
| Time x Group      | -6.15  | (3.11)*  | -1.96 | (1.41)   | -0.68      | (0.62)   | -0.87   | (0.68)   | -4.83            | (1.60)** | -1.07    | (0.56)†  | -1.25      | (0.53)*  |

Note. CG = complicated grief; PTSD = posttraumatic stress disorder; T1 = baseline measurement; T2 = post-measurement; T3 = three month follow-up; Ex = exposure therapy; Co = waiting list control group. † =  $p < .10$ ; \* =  $p < .05$ ; \*\* =  $p < .01$ .

**Table 3** Multilevel regression intention-to-treat analyses: time and interaction effects (time x group) at post-measurement (Model 1) and follow-up (Model 2) behavioral activation versus control group.

|                   | CG    |          | PTSD  |          | Depression |          | Anxiety |          | Grief rumination |          | Brooding |          | Reflection |          |
|-------------------|-------|----------|-------|----------|------------|----------|---------|----------|------------------|----------|----------|----------|------------|----------|
|                   | b     | (SE)     | b     | (SE)     | b          | (SE)     | b       | (SE)     | b                | (SE)     | b        | (SE)     | b          | (SE)     |
| <b>Model 1</b>    |       |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| <u>Within</u>     |       |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Constant          | 66.22 | (4.17)** | 42.04 | (1.87)** | 10.27      | (1.18)** | 13.11   | (1.06)** | 47.78            | (2.47)** | 10.93    | (0.86)** | 10.08      | (0.65)** |
| Time (T1 vs. T2)  | -1.68 | (1.96)   | 1.07  | (0.94)   | 1.15       | (0.45)*  | -0.49   | (0.43)   | -1.88            | (1.12)   | -0.26    | (0.42)   | -0.24      | (0.32)   |
| <u>Between</u>    |       |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Brooding T1       | 1.26  | (0.83)   | 0.54  | (0.37)   | 0.58       | (0.23)*  | 0.59    | (0.21)** | 0.76             | (0.49)   | -        | -        | 0.24       | (0.13)*  |
| Depression T1     | 2.35  | (0.60)** | 1.04  | (0.27)*  | -          | -        | 0.31    | (0.16)*  | 0.89             | (0.36)*  | 0.28     | (0.12)*  | 0.18       | (0.09)*  |
| Group (Ba vs. Co) | -1.57 | (5.76)   | -2.26 | (2.58)   | 1.29       | (1.63)   | 1.35    | (1.47)   | -0.90            | (3.41)   | 1.75     | (1.15)   | 0.47       | (0.89)   |
| Group x Time      | -7.16 | (2.68)** | -3.48 | (1.28)** | 0.12       | (0.62)   | -1.04   | (0.59)†  | -3.92            | (1.54)*  | -0.61    | (0.58)   | 0.96       | (0.45)*  |
| <b>Model 2</b>    |       |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| <u>Within</u>     |       |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Constant          | 65.11 | (3.98)** | 41.00 | (1.81)** | 9.87       | (1.15)** | 13.00   | (1.05)** | 46.92            | (2.39)   | 10.42    | (0.80)** | 9.95       | (0.69)** |
| Time (T1 vs. T3)  | -1.67 | (1.90)   | -0.97 | (1.03)** | 1.15       | (0.36)** | -0.48   | (0.46)   | -1.96            | (0.93)*  | -0.29    | (0.39)   | -0.25      | (0.38)   |
| <u>Between</u>    |       |          |       |          |            |          |         |          |                  |          |          |          |            |          |
| Brooding T1       | 1.38  | (0.78)   | 0.49  | (0.34)   | 0.56       | (0.22)*  | 0.61    | (0.21)** | 0.87             | (0.48)   | -        | -        | 0.19       | (0.09)*  |
| Depression T1     | 2.34  | (0.57)   | 1.07  | (0.25)** | -          | -        | 0.36    | (0.15)*  | 0.77             | (0.36)*  | 0.26     | (0.11)   | 0.22       | (0.13)   |
| Group (Ba vs. Co) | 0.08  | (5.49)   | -1.11 | (2.48)   | 1.88       | (1.57)   | -1.29   | (1.45)   | -0.04            | (3.31)   | 2.41     | (1.08)*  | 0.67       | (0.95)   |
| Time x Group      | -7.16 | (2.60)** | -3.40 | (1.40)*  | 0.12       | (0.50)   | -1.04   | (0.63)†  | -3.80            | (1.28)** | -0.57    | (0.54)   | -0.95      | (0.52)†  |

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up measurement. Ba = behavioral activation. Co = waiting list control group. † =  $p < .10$ . \* =  $p < .05$ . \*\* =  $p < .01$ .

**Table 4** Observed means exposure versus control group at post-measurement and three month follow-up with corresponding Cohen's *d* effect sizes

| Group                 | Baseline         |      |                  |      | Post-test        |      |                  |       | Follow-up        |      |                  |               |        |
|-----------------------|------------------|------|------------------|------|------------------|------|------------------|-------|------------------|------|------------------|---------------|--------|
|                       | Mean             | SD   | Mean             | SD   | Mean             | SD   | Mean             | SD    | Mean             | SD   | within group     | between group |        |
|                       | Cohen's <i>d</i> |      | Cohen's <i>d</i> |      | Cohen's <i>d</i> |      | Cohen's <i>d</i> |       | Cohen's <i>d</i> |      | Cohen's <i>d</i> |               |        |
| Complicated grief     | Exposure         | 62.3 | 12.9             | 50.7 | 18.6             | 47.1 | 19.1             | 0.73  | 0.79*            | 47.1 | 19.1             | 0.93          | 0.63** |
|                       | Control          | 57.2 | 22.3             | 59.9 | 24.0             | 53.5 | 23.1             | -0.12 |                  | 53.5 | 23.1             | 0.16          |        |
| Posttraumatic stress  | Exposure         | 37.3 | 5.2              | 32.5 | 7.2              | 31.5 | 7.1              | 0.77  | 0.97**           | 31.5 | 7.1              | 0.94          | 0.49   |
|                       | Control          | 37.7 | 9.0              | 40.0 | 10.5             | 35.4 | 10.5             | -0.24 |                  | 35.4 | 10.5             | 0.23          |        |
| Depression            | Exposure         | 11.1 | 3.3              | 7.8  | 4.0              | 7.3  | 3.9              | 0.91  | 0.66*            | 7.3  | 3.9              | 1.07          | 0.23   |
|                       | Control          | 8.8  | 5.5              | 8.4  | 6.6              | 5.9  | 6.0              | 0.06  |                  | 5.9  | 6.0              | 0.50          |        |
| Anxiety               | Exposure         | 10.9 | 3.2              | 9.4  | 3.6              | 8.3  | 3.2              | 0.45  | 0.44†            | 8.3  | 3.2              | 0.82          | 0.36   |
|                       | Control          | 11.0 | 4.6              | 11.2 | 5.1              | 9.8  | 6.5              | -0.04 |                  | 9.8  | 6.5              | 0.21          |        |
| Grief rumination      | Exposure         | 46.1 | 8.1              | 37.1 | 9.6              | 32.3 | 6.4              | 1.02  | 1.15*            | 32.3 | 6.4              | 1.89          | 1.15** |
|                       | Control          | 43.5 | 8.7              | 44.1 | 11.0             | 39.4 | 9.9              | -0.06 |                  | 39.4 | 9.9              | 0.44          |        |
| Depressive brooding   | Exposure         | 11.3 | 2.5              | 9.6  | 2.5              | 8.4  | 2.1              | 0.68  | 0.95**           | 8.4  | 2.1              | 1.26          | 0.68†  |
|                       | Control          | 9.8  | 3.4              | 11.0 | 4.1              | 9.0  | 3.3              | -0.31 |                  | 9.0  | 3.3              | 0.25          |        |
| Depressive reflection | Exposure         | 11.0 | 2.9              | 9.9  | 2.5              | 7.8  | 1.8              | 0.42  | 0.34             | 7.8  | 1.8              | 1.36          | 0.84*  |
|                       | Control          | 9.1  | 3.2              | 9.0  | 2.8              | 8.4  | 2.6              | 0.03  |                  | 8.4  | 2.6              | 0.23          |        |

Note. *p*-values are based on multilevel regression analyses. † = *p* < .10, \* = *p* < .05, \*\* = *p* < .01.

**Table 5** Observed means behavioral activation versus control group at post-measurement and three-month follow-up with corresponding Cohen's *d* effect sizes

| Group                 | Baseline         |               |  | Post-test        |               |        | Follow-up        |               |      |        |
|-----------------------|------------------|---------------|--|------------------|---------------|--------|------------------|---------------|------|--------|
|                       | Mean             | SD            |  | Mean             | SD            |        | Mean             | SD            |      |        |
|                       | Cohen's <i>d</i> |               |  | Cohen's <i>d</i> |               |        | Cohen's <i>d</i> |               |      |        |
|                       | within group     | between group |  | within group     | between group |        | within group     | between group |      |        |
| Complicated grief     | 70.8             | 11.8          |  | 57.0             | 17.5          | 0.92** | 51.3             | 16.4          | 1.36 | 0.89** |
| Control               | 57.2             | 22.3          |  | 59.9             | 24.0          | -0.12  | 53.5             | 23.1          | 0.16 |        |
| Posttraumatic stress  | 42.2             | 6.2           |  | 38.4             | 7.5           | 0.56   | 34.2             | 6.8           | 1.23 | 0.75*  |
| Control               | 37.7             | 9.0           |  | 40.0             | 10.5          | -0.24  | 35.4             | 10.5          | 0.23 |        |
| Depression            | 12.5             | 2.8           |  | 10.8             | 3.1           | 0.58   | 10.6             | 2.3           | 0.78 | -0.20  |
| Control               | 8.8              | 5.5           |  | 8.4              | 6.6           | 0.06   | 5.9              | 6.0           | 0.50 |        |
| Anxiety               | 13.1             | 3.3           |  | 11.4             | 3.2           | 0.53   | 10.1             | 3.3           | 0.91 | 0.46†  |
| Control               | 11.0             | 4.6           |  | 11.2             | 5.1           | -0.04  | 9.8              | 6.5           | 0.21 |        |
| Grief rumination      | 49.3             | 9.3           |  | 43.0             | 11.7          | 0.60   | 37.0             | 9.5           | 1.31 | 0.91** |
| Control               | 43.5             | 8.7           |  | 44.1             | 11.0          | -0.06  | 39.4             | 9.9           | 0.44 |        |
| Depressive brooding   | 13.2             | 2.8           |  | 11.7             | 3.4           | 0.48   | 11.5             | 2.2           | 0.71 | 0.30   |
| Control               | 9.8              | 3.4           |  | 11.0             | 4.1           | -0.31  | 9.0              | 3.3           | 0.25 |        |
| Depressive reflection | 11.2             | 2.4           |  | 9.7              | 1.6           | 0.75   | 8.8              | 1.9           | 1.12 | 0.61†  |
| Control               | 9.1              | 3.2           |  | 9.0              | 2.8           | 0.03   | 8.4              | 2.6           | 0.23 |        |

Note. *p*-values are based on multilevel regression analyses. Baseline levels of brooding and depression were used as control variables in these analyses. \* =  $p < .05$ , † =  $p < .10$ .

## Completers analyses

Table 6 and 7 show the completers means and standard deviations and corresponding within and between group effect sizes. We conducted repeated-measures AN(C)OVA's to establish treatment effects. Notably, in order to adjust for potential violations of normality due to small sample sizes, we additionally conducted ANCOVA's with 5000 bootstrap resamples in which we used group as between factor and baseline levels of dependent variables as a covariate. The results of these analyses were highly similar to our repeated-measures AN(C)OVA's, and will therefore not be reported here.

**Treatment-effects for exposure at post-test and follow-up.** At post-measurement, significant interaction effects (Time x Group) were found for exposure on levels complicated grief,  $F(1, 20) = 6.59, p = .02, d = 0.8$ , posttraumatic stress,  $F(1, 20) = 10.45, p = .004, d = 1.1$ , depression,  $F(1, 20) = 5.77, p = .03, d = .07$ , anxiety,  $F(1, 20) = 10.23, p = .005, d = 0.7$ , grief rumination,  $F(1, 20) = 7.73, p = .01, d = 1.4$ , and depressive brooding,  $F(1, 20) = 12.56, p = .002, d = 1.1$ , but not reflection,  $F(1, 20) = 1.65, p = .21, d = 0.5$ .

At follow-up, effects of exposure were maintained for complicated grief,  $F(1, 18) = 4.35, p = .05, d = 0.7$ , and grief rumination,  $F(1, 18) = 10.96, p = .004, d = 1.4$ , and an additional significant effect was found for depressive reflection,  $F(1, 18) = 4.55, p = .047, d = 0.9$ . However, no interaction effects were detected for other variables that were significantly reduced at post-treatment, such as symptoms of posttraumatic stress,  $F(1, 18) = 2.95, p = .10, d = 0.7$ , depression,  $F(1, 18) = 2.10, p = .16, d = 0.4$ , and anxiety,  $F(1, 18) = 2.36, p = .14, d = 0.5$ , and depressive brooding,  $F(1, 18) = 3.74, p = .07, d = 0.8$ .

**Treatment effects for behavioral activation at post-test and follow-up.** Whereas the completers analyses of exposure therapy generally corresponded with the findings of the intention-to-treat analyses, this was not so in the behavioral activation condition. At post-measurement, significant interaction effects were only found on depressive brooding,  $F(1, 14) = 6.11, p = .03, d = 0.8$ , and depressive reflection,  $F(1, 13) = 4.74, p = .049, d = 0.8$ . No significant effects were detected for symptom levels of complicated grief,  $F(1, 13) = 0.65, p = .43, d = 0.4$ , posttraumatic stress,  $F(1, 13) = 3.55, p = .08, d = 0.9$ , depression  $F(1, 14) = 1.31, p = .27, d = 0.2$ , and anxiety,  $F(1, 13) = 0.60, p = .45, d = 0.4$ , or grief rumination  $F(1, 13) = 2.15, p = .17, d = 0.5$ .

At follow-up, the effects of behavioral activation were not maintained in participants who completed treatment. In fact, no significant interaction effects emerged at three month follow-up for any of the dependent variables (i.e., symptoms of complicated grief,  $F(1, 13) = 0.63, p = .44, d = 0.6$ , posttraumatic stress,  $F(1, 13) = 2.21, p = .16, d = 1.1$ , depression,  $F(1, 14) = 1.11, p = .31, d = 0.0$ , and anxiety,  $F(1, 13) = 1.19, p = .29, d = 0.4$ , and grief rumination,  $F(1, 13) = 3.66, p = .08, d = 1.0$ , depressive brooding,  $F(1, 14) = 1.11, p = .31, d = 0.5$ , and depressive reflection  $F(1, 13) = 2.08, p = .17, d = 0.9$ ).

**Table 6** Completers means exposure versus control group at post-measurement and three month follow-up with corresponding Cohen's d effect sizes

| Group                 | Baseline |      |           | Post-test |      |           | Follow-up    |               |      |      |              |               |
|-----------------------|----------|------|-----------|-----------|------|-----------|--------------|---------------|------|------|--------------|---------------|
|                       | Mean     | SD   | Cohen's d | Mean      | SD   | Cohen's d | Cohen's d    |               | Mean | SD   | Cohen's d    |               |
|                       |          |      |           |           |      |           | within group | between group |      |      | within group | between group |
| Complicated grief     | Exposure | 62.0 | 11.9      | 46.1      | 17.5 | 1.06      | 0.84*        | 43.6          | 17.7 | 1.22 | 0.74*        |               |
|                       | Control  | 59.7 | 25.5      | 59.3      | 25.3 | 0.02      |              | 54.9          | 24.0 | 0.19 |              |               |
| Posttraumatic stress  | Exposure | 21.8 | 5.3       | 14.8      | 7.9  | 1.04      | 1.12**       | 13.4          | 7.3  | 1.31 | 0.71         |               |
|                       | Control  | 21.2 | 10.3      | 22.8      | 11.2 | -0.14     |              | 18.3          | 11.1 | 0.27 |              |               |
| Depression            | Exposure | 10.4 | 3.0       | 6.9       | 3.8  | 1.02      | 0.66*        | 6.6           | 4.0  | 1.07 | 0.39         |               |
|                       | Control  | 8.0  | 5.9       | 7.4       | 6.2  | 0.10      |              | 5.9           | 6.4  | 0.34 |              |               |
| Anxiety               | Exposure | 11.5 | 3.5       | 8.5       | 3.5  | 0.65      | 0.67**       | 7.8           | 3.3  | 1.09 | 0.46         |               |
|                       | Control  | 11.0 | 5.1       | 11.1      | 5.4  | -0.01     |              | 9.4           | 6.7  | 0.27 |              |               |
| Grief rumination      | Exposure | 47.4 | 7.0       | 35.9      | 10.0 | 1.33      | 1.41**       | 32.0          | 7.0  | 2.20 | 1.43**       |               |
|                       | Control  | 43.9 | 10.0      | 44.3      | 11.6 | -0.03     |              | 40.4          | 9.9  | 0.35 |              |               |
| Depressive brooding   | Exposure | 12.0 | 2.3       | 10.1      | 2.3  | 0.83      | 1.07*        | 8.8           | 2.0  | 1.48 | 0.83†        |               |
|                       | Control  | 9.7  | 3.7       | 10.9      | 4.3  | -0.29     |              | 8.9           | 3.5  | 0.22 |              |               |
| Depressive reflection | Exposure | 11.3 | 3.1       | 9.9       | 2.5  | 0.50      | 0.47         | 8.0           | 1.8  | 1.30 | 0.87**       |               |
|                       | Control  | 8.7  | 3.4       | 8.8       | 2.9  | -0.03     |              | 8.2           | 2.7  | 0.16 |              |               |

Note. *p*-values are based on repeated-measures ANOVAs. † = *p* < .10, \* = *p* < .05, \*\* = *p* < .01.

**Table 7** Completers means behavioral activation versus control group at post-measurement and three-month follow-up with corresponding Cohen's *d* effect sizes

|                       | Group        | Baseline         |              |                  |              | Post-test        |              |                  |              | Follow-up        |              |                  |    |
|-----------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|----|
|                       |              | Mean             | SD           | Mean             | SD |
|                       |              | Cohen's <i>d</i> |    |
|                       | within group | between group    |    |
| Complicated grief     | Activation   | 69.4             | 11.1         | 61.9             | 18.9         | 0.48             | 0.40         | 53.3             | 20.7         | 0.96             | 0.61         |                  |    |
|                       | Control      | 59.7             | 25.5         | 59.3             | 25.3         | 0.02             |              | 54.9             | 24.0         | 0.19             |              |                  |    |
| Posttraumatic stress  | Activation   | 28.3             | 3.9          | 23.1             | 8.4          | 0.79             | 0.94†        | 17.6             | 7.7          | 1.75             | 1.08         |                  |    |
|                       | Control      | 21.2             | 10.3         | 22.8             | 11.2         | -0.14            |              | 18.3             | 11.1         | 0.27             |              |                  |    |
| Depression            | Activation   | 13.4             | 2.5          | 12.1             | 2.5          | 0.52             | 0.17         | 11.3             | 1.6          | 1.00             | 0.00         |                  |    |
|                       | Control      | 8.0              | 5.9          | 7.4              | 6.2          | 0.10             |              | 5.9              | 6.4          | 0.34             |              |                  |    |
| Anxiety               | Activation   | 14.1             | 2.3          | 12.6             | 2.2          | 0.67             | 0.43         | 10.9             | 2.9          | 1.22             | 0.43         |                  |    |
|                       | Control      | 11.0             | 5.1          | 11.1             | 5.4          | -0.01            |              | 9.4              | 6.7          | 0.27             |              |                  |    |
| Grief rumination      | Activation   | 52.0             | 8.5          | 47.4             | 11.1         | 0.46             | 0.54         | 39.4             | 11.4         | 1.25             | 1.00†        |                  |    |
|                       | Control      | 43.9             | 10.0         | 44.3             | 11.6         | -0.03            |              | 40.4             | 9.9          | 0.35             |              |                  |    |
| Depressive brooding   | Activation   | 13.6             | 2.4          | 12.3             | 3.2          | 0.46             | 0.84*        | 11.4             | 2.6          | 0.87             | 0.48         |                  |    |
|                       | Control      | 9.7              | 3.7          | 10.9             | 4.3          | -0.29            |              | 8.9              | 3.5          | 0.22             |              |                  |    |
| Depressive reflection | Activation   | 11.7             | 1.6          | 9.7              | 1.8          | 1.17             | 0.84*        | 8.9              | 2.3          | 1.41             | 0.92         |                  |    |
|                       | Control      | 8.7              | 3.4          | 8.8              | 2.9          | -0.03            |              | 8.2              | 2.7          | 0.16             |              |                  |    |

Note. *p*-values are based on repeated-measures ANOVAs. Baseline levels of brooding and depression were used as control variables in these analyses. \* = *p* < .05; † = *p* < .10

## Clinical change

As a measure of clinically-relevant change, we calculated the Reliable Change Index (RCI: Jacobson, Folette, & Revenstorf, 1984), using the observed values for all participants, for our main outcome measures: complicated grief and grief rumination.

At post-test, 46.7% of participants in the exposure group, 45.5% of participants in the behavioral activation group and 10.0% of people in the control group had achieved reliable change on complicated grief symptoms. At three-month follow-up, 58.3% of participants in the exposure group, 63.6% of participants in the behavioral activation group, and 20.0% of people in the control group had attained reliable change on complicated grief levels. Chi-square tests showed marginally significant differences in the percentage of participants that attained reliable change between the exposure and control group at post-test,  $\chi^2(1) = 3.71, p = .054$ , and follow-up,  $\chi^2(2) = 3.32, p = .07$ , and between behavioral activation and the control group at post-test,  $\chi^2(1) = 3.23, p = .07$ , but not at follow-up,  $\chi^2(1) = 1.53, p = .22$ .

At post-test, 46.7% of participants in the exposure group, 36.4% of participants in the behavioral activation group and 10.0% of people in the control group had achieved reliable change on grief rumination. At follow-up, 66.7% of participants in the exposure group, 45.5% of participants in the behavioral activation group, and 30.0% of people in the control group had attained reliable change on grief rumination. Chi-square tests showed marginally significant differences in the percentage of participants that achieved reliable change between the exposure and control group at post-test,  $\chi^2(1) = 3.71, p = .054$ , and follow-up,  $\chi^2(1) = 2.93, p = .09$ , but not between behavioral activation and the control group at either measurement moment ( $p$ 's > .10).

## DISCUSSION

In the current study, we set out to examine the effectiveness and feasibility of two different modules of brief therapist-guided online CBT modules for people experiencing elevated levels of complicated grief and grief rumination: exposure and behavioral activation. Our intention-to-treat analyses showed that, compared to a waiting list control group, each intervention resulted in large effects on the two core variables of interest, complicated grief and grief rumination, at post-measurement, and that these effects were maintained at three-month follow-up. Additionally, it was shown that exposure yielded moderate to large effects on symptom levels of depression, posttraumatic stress and brooding at post-treatment, yet these effects were not retained at follow-up. Behavioral activation strongly reduced symptoms of posttraumatic stress at post-test and follow-up measurement, but did not consistently yield any other effects.

Completers analyses confirmed the effectiveness of exposure therapy, giving highly similar results as the intention-to-treat analyses, with only one exception: exposure therapy additionally reduced anxiety at post-treatment. By contrast, the results of the completers analyses for the

behavioral activation group yielded very different results from the intention-to-treat analyses: Behavioral activation resulted in large reductions depressive brooding and reflection at post-measurement, but yielded no other significant effects.

The pattern of results supports the potential of exposure therapy as an online treatment module for people who experience high levels of loss-related distress and rumination. Intention-to-treat and completers analyses support its effectiveness in reducing levels of distress and rumination in the short-term and show that exposure maintains effects on core dependent variables (i.e., complicated grief and grief rumination) over a three-month period. The potential of this form of treatment is further reflected in acceptable feasibility ratings and in a comparatively low dropout rate. These findings correspond with trials which have shown large effects of face-to-face and guided internet-based CBT for complicated grief using exposure therapy modules as part of a larger, integrated therapy (e.g., Boelen et al., 2007; Rosner et al., 2014; Shear et al., 2005; Wagner et al., 2006).

A unique finding was that exposure therapy for bereaved persons reduced grief rumination and depressive rumination (cf. Wisco et al., 2013). As such, it adds to a larger body of research supporting the hypothesis that rumination after bereavement could serve as a cognitive avoidance strategy (RAH: Stroebe et al., 2007, e.g., Boelen et al., 2006; Eisma et al., 2013; Eisma et al., 2014b; Giorgio et al., 2010; Morina, 2011). That is, as exposure therapy increases confrontation with painful aspects of the loss, it reduces the need to engage in avoidance behavior (Boelen et al., 2011). The strong reductions in rumination following exposure therapy seem to suggest rumination acts as an avoidance process in adjustment to bereavement.

The general pattern of findings for behavioral activation is more difficult to interpret. While consistent reductions in complicated grief, posttraumatic stress and grief rumination levels at post-test and follow-up were found in intention-to-treat analyses, the completers analyses showed a very different picture, only yielding significant effects on brooding and reflection at post-test. While the results of the intention-to-treat analyses in large part corresponded with a recent pilot investigation demonstrating large effects of behavioral activation for complicated grief, posttraumatic stress and depression levels (Papa et al., 2013a), the completers analyses did not. Furthermore, there was high dropout in the behavioral activation condition and inconsistent feasibility ratings were found, indicating that our protocol is not suitable for clinical application in its current form.

Notably, the inconsistencies in results of our two types of analyses on behavioral activation can be attributed to two interrelated causes. First, with only seven treatment completers in the behavioral activation group, our power was too low to detect anything but very large effects in the completers analyses. Were we to find the same effects in a bigger sample, the completers analyses would have resembled the intention-to-treat analyses, as was the case for exposure. However, as the effect sizes for dependent variables in the completers sample did not correspond consistently with the results from the intention-to-treat analyses, this explanation does not account for all

of the differences in results. For example, the intention-to-treat analyses showed effects on complicated grief, posttraumatic stress and grief rumination levels at post-test and follow-up. Yet, in the completers sample, large effects were only observed (not detected) on posttraumatic stress symptoms. The treatment results of non-completers included in the intention-to-treat analyses, but not in the completers analyses, may therefore partly explain these differences in results (see: Table 5 and 7).

Despite the inconsistent support for the effectiveness and clinical applicability of online behavioral activation, a notable finding was that it reduced grief rumination relative to the control group across both time-points in the intention-to-treat analyses, and that brooding and reflection were reduced at post-test in the completers analyses. These results add to a growing number of studies that preliminarily supports the effectiveness of engaging in new meaningful activities in targeting rumination and worry (e.g., Chen, Liu, Rapee, & Pillay, 2013; Papa et al., 2013b; Watkins et al., 2011). Potentially, behavioral activation may take up time, and challenges negative cognitions, thereby ameliorating rumination and loss-related distress (Boelen et al., 2006; Eisma et al., 2013; Nolen-Hoeksema et al., 2008).

This study had a number of limitations. The most important limitation was that our investigation suffered from power problems. While the multilevel regression analyses we conducted in our intention-to-treat procedure partly solved this problem, it is imperative to investigate online exposure and behavioral activation in larger samples. The benefits of such research could be threefold. First, it would allow for a statistical comparison of the relative effectiveness of exposure and behavioral activation. Second, it could lead to stronger conclusions about the effectiveness of guided online CBT for bereaved individuals. Lastly, it would provide an opportunity to detect moderate effects on secondary outcome measures, such as depression and anxiety symptoms.

Another limitation is that conjugally bereaved women were overrepresented in the present sample. This is common in bereavement research, and likely reflects both a relative overrepresentation of women in widowhood and a stronger need of women to share their feelings about a loss (Stroebe, Stroebe, & Schut, 2001). Notably, some research has shown gender differences in the effectiveness of grief therapy. For instance, Schut, Stroebe, van den Bout and de Keijser (1998) found that women responded more strongly to problem-focused grief treatment (e.g., gradual exposure and rational-emotive exercises), whereas men had more treatment gains in emotion-focused therapy (e.g., acceptance-based and client-centered exercises). However, a large meta-analysis of grief therapy trials was not able to show effects of gender on grief treatment effects (Currier et al., 2008). A related limitation is that a majority of people who participated in this study were highly educated. Obviously, it is conceivable that better-educated persons benefit more from treatment and in particular of internet-delivered treatment. A replication study in a lower-educated sample is therefore recommended.

Lastly, the participants in our sample did not meet the criteria for a complicated grief disorder, but instead only showed elevated levels of complicated grief and grief rumination. Since levels

of loss-related distress have been found to be positively related to grief therapy outcome (for reviews: Currier et al., 2008; Mancini et al., 2012; Schut et al., 2001), this could imply that our online interventions may have yielded larger effects in a clinically bereaved sample. This is an important topic for future investigation too.

Despite these limitations, the current investigation made a unique contribution to understanding the effectiveness and feasibility of guided internet-delivered CBT for subclinical complicated grief and grief rumination. Simultaneously, it is also one of the first studies to support the potential applicability of brief treatment for distressed bereaved individuals. Specifically, it has provided preliminary evidence for the effectiveness and clinical applicability of internet-based exposure. However, despite some promising findings, it did not consistently support beneficial effects or the feasibility of online behavioral activation.

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**Summary and  
General Discussion**

# Chapter 8



The overarching aim of this dissertation was to gain better understanding of rumination, a risk factor for poor bereavement outcome (for a review: Watkins & Moulds, 2013), so it can be targeted more effectively in interventions. We defined grief-related rumination broadly as thinking repetitively and recurrently about the causes and consequences of a loss and loss-related negative emotions. Until recently, many researchers regarded rumination after bereavement as a maladaptive confrontation strategy (e.g., Nolen-Hoeksema, 2001). However, other scientists have taken a contrasting view, stating that rumination could serve as cognitive avoidance of painful aspects of a loss, thereby contributing to grief complications (e.g., Rumination as Avoidance Hypothesis, RAH: Stroebe et al., 2007). Crucially, these different conceptualizations of rumination potentially lead to different guidelines for clinical practice. Put simply: if rumination is a confrontation process, then positive distraction may be the best strategy to reduce it, but if it is avoidance, then exposure may ameliorate it more effectively.

We aimed to shed further light on the function of rumination in a stepwise research project, constructed to achieve three interrelated goals. First, we aimed to develop and validate a scale to measure grief-related rumination by conducting two survey studies in three bereaved samples. Second, we set out to investigate the function of rumination in a longitudinal survey study and two laboratory investigations. Third, as a final test of the contrasting views on rumination, and a test of the clinical implications of each view, we conducted a randomized controlled trial to investigate the effectiveness of exposure and behavioral activation in reducing rumination and loss-related distress. In this final chapter, we will summarize the studies we conducted in order to achieve each of these goals. Additionally, we elaborate upon the general limitations of these studies and give directions for future research. This chapter is organized around the three integrated general themes of this dissertation: assessment, working mechanisms, and intervention.

### **Assessment of rumination following bereavement**

Since there were no reliable and valid instruments available to assess the ruminative thinking that bereaved people were likely to engage in, a first goal of our research project was to develop and validate a scale to measure grief-specific rumination.

In *Chapter 2* we reported on the development and psychometric evaluation of the Utrecht Grief Rumination Scale (UGRS), a new scale that measures grief rumination. In order to examine the psychometric properties of this scale, we collected online cross-sectional data from 204 English and 316 Dutch recently bereaved individuals. Comparative confirmatory factor analyses showed that a correlated five-factor model fit the data best, and that factor structures of the new scale were highly comparable across language groups. Data further confirmed the reliability of the UGRS and its subscales (i.e., rumination about injustice, personal reactions, meaning of the loss, and social relationships, and counterfactual thinking). The convergent and divergent validity, discriminatory validity and concurrent validity of the English and Dutch versions of the total score on the UGRS were also supported. A notable finding was that grief rumination was

concurrently associated with symptom levels of depression, posttraumatic stress disorder and complicated grief, even after controlling for demographic and loss-related variables and other types of ruminative thinking.

As the study described in Chapter 2 was exclusively based on cross-sectional data, and focused mainly on establishing the validity of general grief rumination (based on the total score of the UGRS), we set out to investigate the predictive validity of the UGRS subscales in *Chapter 3*. To this end, we conducted a three-wave longitudinal study in 242 recently bereaved individuals. We compared the predictive value of grief rumination subtypes to that of two subtypes of depressive rumination, brooding and reflection (Treyner, Gonzalez, & Nolen-Hoeksema, 2003), for concurrent and prospective complicated grief and depressive symptom levels. We conducted multiple regression analyses for depressive and grief rumination subtypes separately, controlling for loss-related variables, neuroticism, and, in the longitudinal analyses, baseline symptom levels.

A specific interest we further examined in this study was whether we would be able to distinguish adaptive and maladaptive subtypes of grief rumination. Major reviews of repetitive thought had already shown that repetitive negative thoughts yield more adverse results than repetitive neutral thoughts (e.g., Mor & Winquist, 2002; Watkins, 2008). Additionally, it has been argued that the level of construal of repetitive thought is important in determining its outcomes, with higher-level cognitive construals generally yielding more maladaptive results than lower-level construals (Watkins, 2008). High-level construals are characterized by abstract, general, superordinate, decontextualized mental representations that convey the general gist, or meaning of events and actions. Low-level construals are characterized by more concrete mental representations that include subordinate, contextual, specific, and incidental details of events and actions. To give just one example of how level of construal could be important in explaining outcomes of repetitive thought, abstract repetitive thinking could have negative effects on mental health by interfering with problem solving, whereas concrete repetitive thinking facilitates this process (Watkins, 2008).

Overall, our longitudinal study supported the predictive validity of most UGRS subscales. Results showed that most subtypes of grief rumination were concurrently and longitudinally related to symptom levels of complicated grief and depression. In general, subtypes of grief rumination predicted more variance than subtypes of depressive rumination. We were also able to distinguish adaptive and maladaptive subtypes of rumination after a loss, as these were differentially related to concurrent and prospective symptom levels in our multiple regression models. Notably, in line with influential reviews (e.g., Mor & Winquist, 2002; Watkins, 2008), the more maladaptive type of rumination (i.e., grief rumination about injustice) consisted of negatively-valenced, relatively abstract thinking about injustices to the self and imagining alternative realities to the current situation in which one has experienced a loss. The more adaptive types of ruminative thinking (i.e., grief rumination about personal reactions, depressive reflection), on the other hand, consisted of neutrally-valenced, relatively concrete repetitive thinking aimed at understanding loss-related and depressive feelings.

### **Assessment: Reflection on findings and directions for future research**

The research described in Chapter 2 and Chapter 3 supported the reliability and validity of the Dutch and English UGRS. Findings of both studies largely corresponded with the results of a previous validation study of the UGRS in a Dutch sample of bereaved people (Eisma et al., 2012). For example, in line with the investigation in Chapter 3, this previous study had shown that grief rumination is a better longitudinal predictor of depressive, posttraumatic stress and complicated grief symptom change than other forms of rumination, such as brooding and reflection (Trenor et al., 2003), and the trait tendency to engage in self-focused rumination (Trapnell & Campbell, 1999). Taken together, these results underline the importance of the distinction between grief rumination and other types of rumination in bereaved individuals. Furthermore, they support the potential value of the UGRS as a measure of grief rumination for international research and clinical practice.

Some general observations about these studies are in order. A first issue that needs to be addressed, is that in Chapter 3, we replicated the finding that rumination after bereavement predicts symptom change in psychopathology over time, confirming the role of rumination as a risk factor in adjustment to bereavement (e.g., Eisma et al., 2012; Nolen-Hoeksema, Parker, & Larson, 1994; van der Houwen, Stroebe, Schut, Stroebe, & van den Bout, 2010). That being said, the sizes of the effects of grief rumination on depressive symptom change were modest compared to those in an earlier investigation of depressive rumination (Nolen-Hoeksema et al., 1994). In our studies, grief rumination predicted modest increases in depressive symptom over periods of 6 and 12 months (2-3% explained variance: Eisma et al., 2012; Chapter 3). In an investigation by Nolen-Hoeksema and colleagues (1994) stronger effects were reported for depressive rumination on depressive symptom change over 6 months (8% explained variance).

While this appears discrepant with our results, there are a number of methodological differences between these studies that may explain this pattern of findings. First, the study of Nolen-Hoeksema and colleagues (1994) was a longitudinal cohort study in which only persons who had experienced a loss approximately one month previously were included at baseline. In contrast, our studies were conducted in heterogeneous samples of bereaved individuals who had experienced a loss from one week to three years ago at baseline. Since distress in a majority of bereaved people generally remains low after the first year of bereavement (Bonanno, Westphal, & Mancini, 2011), it is likely that the temporal stability of depressive symptoms was lower in the cohort study, which could have resulted in stronger effects of rumination. Second, Nolen-Hoeksema and colleagues (1994) used structured interviews to assess rumination and depressive symptoms, whereas we exclusively relied on self-report questionnaires to assess these constructs. It is possible that these interviews may have given a more accurate estimation of rumination and depression levels than our questionnaires. Third, and perhaps most importantly, our predictive models were more conservative. We corrected for baseline symptoms and any demographic or loss-related variables that consistently predicted symptom change, other forms of rumination

(Eisma et al., 2012) and neuroticism (Chapter 3), before including grief rumination as a predictor in our regression models. In contrast, Nolen-Hoeksema and colleagues (1994) only corrected for baseline depressive symptoms before entering depressive rumination in their model.

A second important issue is that while the results of Chapter 3 show that the subtypes of ruminative thought that were identified in the UGRS vary on core dimensions which are considered important in explaining the effects of repetitive thinking in general (e.g., valence, level of construal), it needs to be noted that this scale was originally not designed to assess these dimensions. As such, the UGRS may not be perfectly balanced with regard to each of these dimensions, and there appears to be room for improving this measure. Most notably, while it includes both neutral and negative thinking, three out of five subscales predominantly measure neutral ruminative thoughts. Therefore, whereas we are confident that the UGRS includes appropriate thought content, a goal for future research could be to broaden its scope, for instance by including more negatively-valenced rumination items.

A third point is that the studies in Chapter 2 and Chapter 3 were exclusively based on survey methodology, a major aim of future research would be to investigate how well our results generalize across research methods. For example, an interesting line of research could be to assess the relationship between depressive rumination and grief rumination, mood and levels of post-loss distress with ecological momentary assessment (EMA: Shiffman, Stone, & Hufford, 2008). EMA involves repeated sampling of people's current behavior and experiences in real time, in people's natural environments, for instance through the use of a mobile phone application. As a result, EMA eliminates recall bias that survey methodology is subject to, and maximizes ecological validity, as it allows researchers to study the micro-processes that influence behavior in real-world contexts.

Lastly, since our research generally supports the relevance of repetitive thought in adjustment to bereavement, it seems prudent to study other cognitive processes that could play a role in coping with the loss of a loved one. For example, worry, a repetitive thought process that is similar to rumination, has received scant attention in the scientific literature on coping with bereavement, but could very well be relevant (Stroebe et al., 2007). Worry is defined as repetitive verbal thinking focused on uncertain future events with a potential negative outcome (Borkovec, Ray, & Stöber, 1998; Borkovec, Robinson, Pruzinsky, & Dupree, 1983). It has been linked with increases in anxious and depressive symptoms (e.g., Fresco, Frankel, Mennin, Turk, & Heimberg, 2002).

There are two compelling reasons why it would be reasonable to expect that worry influences bereavement outcome. First, the death of a first-degree relative is often accompanied by various secondary stressors that could elicit worry, such as financial problems, health problems, and divorce (Corden & Hirst, 2013; Lyngstad, 2013; Stroebe, Schut, & Stroebe, 2007). Second, a loss-experience could also lead to worries about the physical and mental health of oneself and others. For example, the death of an elderly parent could lead to worries about the well-being of the widowed partner among adult children. Major goals of future research should therefore

be to accurately define grief-related worry and to attempt to gain a deeper understanding of its consequences following loss.

### **Working mechanisms of rumination after bereavement**

As described earlier, there are conflicting ideas about the mechanisms which underlie the maladaptive consequences of ruminative coping. On the one hand, researchers have proposed that rumination after loss is a confrontation process, and that recurrent focus on negative thought content explains the adverse effects of ruminative coping (e.g., Bonanno, Papa, Lalande, Zhang & Noll, 2005; Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999). On the other hand, researchers have argued that rumination serves as cognitive avoidance of painful aspects of the loss, such as the permanence of separation and associated emotions, and thereby fuels complicated grief (e.g., Boelen, van den Hout, & van den Bout, 2006; Stroebe et al., 2007). These conflicting hypotheses about the nature of grief-related rumination could lead to contradictory recommendations for clinical practice. That is, if rumination can best be defined as a confrontation process, then distraction and behavioral activation is a logical therapeutic strategy to reduce it (e.g., Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), but if it is better defined as an avoidance process, then exposure-based therapeutic techniques are probably more effective (RAH: Stroebe et al., 2007; cf. Boelen et al., 2006).

We further noted that while there is considerable evidence for a link between rumination and attention and memory biases for general negative material, such as sad faces and negative words (for a review: Koster, Delisnyder, Derakshan, & de Raedt, 2011), there is a paucity of research on the link between rumination and avoidance of personally-relevant threatening material (i.e., the reality of the loss after bereavement).

In order to establish if avoidance could potentially act as a working mechanism of the relationship between rumination and loss-related distress, a longitudinal survey which allowed for a mediation analysis on these constructs was needed. Additionally, because bereaved people may not always be consciously aware of the avoidance behavior that they engage in (cf. Coifman, Bonanno, Ray, & Gross, 2007), it was considered important to study the relationship between rumination and (implicit) behavioral - as opposed to (explicit) self-report - measures of approach and avoidance tendencies following loss. Therefore, we conducted three interrelated studies to examine the function of rumination after bereavement, which we described in Chapter 4, 5 and 6.

In *Chapter 4*, we presented a three-wave longitudinal survey study in a sample of 282 people who had recently lost a first-degree relative. The primary aim of this investigation was to test three competing hypotheses about how avoidance mediates the relationship between rumination on the one hand, and symptoms of depression and complicated grief on the other hand, using a longitudinal multiple mediation approach. The first hypothesis was that rumination could act as the cognitive content that people use to suppress more threatening thoughts, such as thoughts about the permanence of the loss. The second hypothesis held that rumination decreased the

specificity of highly emotional autobiographical memories, thereby avoiding the negative affect that is related to these memories (note: this type of avoidance was operationalized as experiential avoidance). The third hypothesis was that rumination takes up time and strengthens the feeling that the current situation is hopeless and nothing can be done to overcome it, which leads to behavioral avoidance of activities. This, in turn, exacerbates distress as it reduces opportunities to lift mood and to unnerve negative ideas about the self, the world and the future (e.g., Boelen et al., 2006; Nolen-Hoeksema et al., 2008). Additionally, we aimed to establish if avoidance of the reality of the loss the cognitive content which is avoided, as this is a key assumption of avoidance theories of rumination (RAH: Stroebe et al., 2007; cf. Boelen et al., 2006). So, we added a scale to measure anxious avoidance of the reality of the loss (example item: "I avoid situations and places that confront me with the fact that [...] (the deceased) is dead and will never return") as a fourth mediator to our mediation models.

The main results of this study were that both experiential avoidance and thought suppression were potential mediators of the relationship between grief rumination and complicated grief symptoms. Additionally, experiential avoidance and behavioral avoidance mediated the relationships between grief rumination and depressive symptoms. Interestingly, self-reported avoidance of the loss-reality was not a significant mediator of the link between grief rumination and symptom levels. The avoidance of internal experiences and thoughts thus seemed more important in explaining the results of rumination on loss-related distress than the content of what is avoided.

In *Chapter 5*, we described an eye-tracking investigation in a sample of 54 recently bereaved persons, which were divided into low and high ruminators. We examined the short and long-term attention patterns of these participants for loss stimuli (i.e., picture deceased + loss word), loss-related ambiguous stimuli (i.e., picture deceased + neutral word, picture deceased + negative word, picture stranger + loss word), and non-loss-related neutral and negative stimuli (picture stranger + neutral word, picture stranger + negative word), which were repeatedly and randomly shown on a screen in pairs. In line with the hypothesis that rumination is a cognitive avoidance process (RAH: Stroebe et al., 2007), we made two main predictions. First, we predicted that high ruminators, compared to low ruminators, would show a fearful avoidant pattern of attention for loss stimuli in the first 1500 ms of presentation time, which would be characterized by initial subconscious vigilance (0-500ms) and subsequent conscious disengagement (500-1500ms) (cf. Ouimet, Gawronski, & Dozois, 2009). Second, we expected that high ruminators compared to low ruminators would show continued disengagement from (i.e., avoidance of) loss stimuli, and a preference for non-loss-related negative stimuli, at extended presentation times (1500-10000ms). While our results did not support our first hypothesis, they did support the second. Compared to low ruminators, high ruminators spent less time looking at loss stimuli and more time at non-loss-related negative (and neutral) stimuli beyond 1500ms presentation time, even when controlling for concurrent distress (i.e., depressive and complicated grief symptoms). Results on average

fixation times (i.e., time spent looking at a specific stimulus each time one looks at it) mirrored these findings.

In *Chapter 6*, we reported an investigation that aimed to clarify the link between rumination and implicit approach and avoidance behavior, as measured with an Approach Avoidance Task (Rinck & Becker, 2007). Seventy-four people recently bereaved of a first-degree relative were asked to push stimuli away from themselves or to pull these towards themselves as fast as possible on the basis of irrelevant stimulus characteristic (i.e., word color). Stimuli represented the loss (i.e., picture deceased + loss word), were loss-related but ambiguous (picture deceased + neutral word, picture stranger + loss word), or non-loss-related and neutral (picture stranger + neutral word, puzzle picture). In line with RAH (Stroebe et al., 2007), we found that rumination predicted implicit avoidance of loss stimuli (but not other types of stimuli), even when controlling for symptoms of depression or posttraumatic stress disorder. However, correcting for complicated grief symptom levels rendered the association between rumination and loss avoidance insignificant.

### **Working mechanisms: Reflection on findings and directions for future research**

The studies described in Chapters 4, 5 and 6, represent crucial steps in improving the understanding of the function of rumination after bereavement. A first notable finding was that cognitive and experiential avoidance longitudinally mediated the relationship between grief rumination and symptoms of post-loss distress. A second important result was that grief rumination was uniquely linked with attentional and implicit avoidance of (the reality of) the loss, irrespective of current levels of various forms of loss-related distress. Taken together, these findings make a strong case for the notion that rumination is an avoidance mechanism, and provides preliminary support for a causal relationship between rumination, avoidance processes and loss-related distress. Nevertheless, some remarks with regard to limitations and the interpretation of these findings are needed to qualify these general conclusions.

A first important issue is that these studies did not provide conclusive for a causal relationship between rumination and avoidance behavior. The strongest support for such a link is provided by the multiple mediation study. That is, a prerequisite for establishing a causal relationship between variable A and B, is that variable A temporally precedes variable B. However, alternative explanations may also account for the fact that rumination predicted avoidance behavior. For one, it is possible that a third variable explains the associations between rumination and avoidance processes that we observed in the mediation study. To give an example, rumination and avoidance behavior have both been characterized as passive coping styles (e.g., Burwell & Shirk, 2007; Marroquin, Fontes, Scioletta, & Miranda, 2010; Nolen-Hoeksema et al., 2008), and it is possible that the relationship between both constructs could be explained purely by the fact that they belong to the same category of coping strategies. That is, people who have a trait-tendency to engage in passive coping may be likely to engage more in both rumination and avoidance. Since we did not correct for passive coping (or any other third variables apart from distress) in

our mediation study (and our laboratory studies), we cannot be sure that rumination causes avoidance. Future research should therefore employ fully controlled experimental research designs. One way of doing the latter is using the same laboratory tasks and instructing one half of participants engage in rumination prior to conducting a laboratory task, and the other half to engage in another behavior (cf. Lyubomirsky & Nolen-Hoeksema, 1993; Watkins & Teasdale, 2001). This way, it may be determined whether it is engagement in rumination and not another, third variable that causes loss avoidance. However, this solution comes with some limitations. The most notable limitation is that it does not take into account the possibility that rumination could be a reactive avoidance process. That is, if rumination is only used as an avoidant strategy when a person is confronted with a personally-relevant threat, such as the reality of the loss, then instructing people to ruminate prior to a laboratory task would obviously not provide a valid test of the working mechanisms of rumination.

Another issue that is important to consider, is that our results could be due to the fact that rumination is not itself an avoidance strategy, but rather that there are reciprocal links between rumination and avoidance processes. For example, we suggested in Chapter 4 that rumination could function as the thought content which people use to suppress more threatening cognitions. The rationale behind this hypothesis was as follows. Depressed individuals more often distract themselves from other thoughts with negative instead of positive thoughts in suppression tasks, because these thoughts are more cognitively salient, even though distraction with positive thoughts would be likely to be more effective (Wenzlaff, Wegner, & Roper, 1988). Building on this, we hypothesized that since cognitive material about the loss is highly salient in distressed bereaved persons (e.g., Boelen & Huntjens, 2008), that these persons would distract themselves from more threatening loss-related thoughts by ruminating about other less threatening loss-related topics. In contrast, other researchers have argued that rumination and thought suppression reciprocally influence each other. For instance, Nolen-Hoeksema and colleagues (2008) suggested that individuals may attempt to escape from rumination through suppression of negative thoughts. Such thought suppression logically leads to rebound-effects, making negative thoughts more salient, thereby fuelling ruminative thinking (Erber & Wegner, 1996).

Although we cannot rule out that the associations between rumination and avoidance in our studies may also be due to the latter explanation, our eye-tracking study does provide preliminary evidence against this line of reasoning. In this investigation, high ruminators - compared to low ruminators - engaged in conscious attentional avoidance of stimuli that represented the loss (i.e., picture deceased + loss word), while simultaneously showing attentional preference for more benign negative stimuli (i.e., picture stranger + negative word). Thus, when confronted with personally-relevant threatening material, high ruminators focused on material that was negative, but arguably less threatening.

A third issue is that while we proposed three potential mechanisms that could link rumination and avoidance in Chapter 4, these mechanisms have yet to be tested specifically. That is, whereas

establishing associations between rumination and behavioral measures of loss avoidance (attention patterns; implicit avoidance) is an important step in clarifying a potential cognitive avoidant function of rumination following bereavement, it is by no means a formal test of the mechanisms we proposed. While we have shown *what* is potentially avoided through rumination, it is still somewhat unclear *how* this avoidance takes place. Therefore, in future research, the proposed links between rumination and avoidance processes (e.g., the suppression hypothesis) need to be investigated further.

In addition to the former issues, it is informative to consider the broader relevance of the studies in Chapter 4, 5 and 6 for other research areas in clinical psychology. As noted before, the hypothesis that rumination following loss serves an avoidant function (RAH: Stroebe et al., 2007), draws from prior literature, including work on repetitive thought in other clinical contexts, such as worry in generalized anxiety disorder (GAD) (e.g., Borkovec et al., 1998) and rumination in posttraumatic stress disorder (PTSD) (e.g., Ehlers & Clark, 2000). It would seem logical, then, that our work indirectly increases our understanding of underlying mechanisms and correlates of repetitive thinking in these research areas

Since the death of a loved one is classified among the most stressful events that a person can experience, our research may open up possibilities to further investigate the function of rumination in PTSD. As mentioned in the introduction, Ehlers and Clark (2000) argued that rumination may contribute to PTSD because it is similar to cognitive avoidance, as it focusses on 'what if...' questions rather than on the experience of the trauma as it actually happened. However, studies that specifically examined the association between rumination and avoidance following a potentially traumatic life-event are relatively scarce. A notable exception is a study by Halligan, Michael, Wilhelm, Clark and Ehlers (2006), who showed that physiological reactivity (i.e., heart rate response) of assault survivors recalling trauma memories was negatively associated with rumination about this traumatic event. Our results complement these findings. A theoretically and clinically relevant avenue for future research could be to clarify whether our pattern of findings can be generalized to individuals experiencing other types of potentially traumatic events, such as road traffic accidents, natural disasters or war-related violent experiences.

In a similar vein, it could be informative to explore to what extent our hypotheses and findings complement theories and research results on worry and avoidance. That is, multiple theories have been proposed about the cognitive avoidant function of worry and rumination, most of which assume that the respective thought process acts to avoid (strong increases in) negative emotions (e.g., Borkovec et al., 1998; Eisma et al., 2013; Newman & Llera, 2011). Since worry and rumination are similar thought processes (Nolen-Hoeksema et al., 2008), an interesting direction for future research could be to assess whether, and to what extent, avoidance theories of worry are applicable to rumination, and vice versa. To give just one example, our thought suppression hypothesis of rumination, which states rumination serve as the thought content people use to distract themselves from more threatening thoughts, could also apply to worry. Indeed, worrying

taxes cognitive resources (Hayes, Hirsch, & Mathews, 2008) and has shown strong associations with thought suppression and other types of cognitive avoidance (e.g., Sexton & Dugas, 2008). A final issue that it is important to acknowledge that if A leads to B, this does not logically equate to B leading to A. That is, if rumination potentially causes avoidance, this does not imply that reducing avoidance behavior also ameliorates rumination. So, in addition to elucidating the potential link between rumination and approach and avoidance processes, we set out to establish whether, and to what extent, exposure or distraction are effective ways of targeting rumination and loss-related distress following bereavement.

### **Intervention for rumination following bereavement**

As mentioned in the introduction, a final test of the working mechanisms of rumination would be to explicitly test whether, and to what extent, ruminative coping can be reduced through exposure with the most painful aspects of the loss, or alternatively, by engaging in new activities that are considered important and rewarding. If rumination is a maladaptive cognitive avoidance process, then exposure therapy would more be effective in breaking the ruminative cycle and alleviating loss-related distress. Conversely, if rumination is predominantly maladaptive because ruminators focus on negative thought content, then behavioral activation is likely to be a more effective treatment strategy for rumination and post-loss distress. Of course, a formal test of these hypotheses would not only shed more light on the nature of rumination, but would also be a way to explore the potential clinical implications of the findings presented in the previous section.

We further observed that there were empirical results that suggested exposure and behavioral activation could both be effective in reducing ruminative coping after loss. Exposure has frequently and effectively been employed in modern CBT interventions to reduce loss-related distress (e.g., Boelen, de Keijser, van den Hout, & van den Bout, 2007; Wagner, Knaevelsrud, & Maercker, 2006), and a recent randomized controlled trial showed that exposure-based writing therapy for posttraumatic stress disorder reduced rumination (Wisco, Sloan, & Marx, 2013). Behavioral activation was similarly shown to reduce symptom levels of depression, posttraumatic stress and complicated grief, in a randomized open trial (Papa, Sewell, Garrison-Diehn, & Rummel, 2013a), and to reduce levels of rumination in two case studies (Papa, Rummel Garrison-Diehn, & Sewell, 2013b). However, no controlled study had yet been conducted that specifically addressed the question whether these forms of therapy could reduce rumination in bereaved individuals.

Therefore, in *Chapter 7*, we conducted a randomized controlled trial in 47 bereaved persons experiencing elevated levels of grief rumination and complicated grief, in which we compared the effectiveness of 6-week internet-delivered exposure and behavioral activation to a waiting-list control group. At baseline, post-test and three month follow-up rumination (i.e., grief rumination, brooding, reflection) and levels of distress (i.e., symptoms of complicated grief, posttraumatic stress, depression, and anxiety) were assessed. Unfortunately, due to power limitations, we could not conduct a statistical comparison of both treatment groups. Since there were theoretical and

empirical indications for the effectiveness of both interventions, our predictions were that both interventions would be effective in reducing grief rumination and complicated grief symptoms relative to the control group at post-test and follow-up. Additionally, we hypothesized that we would find effects of each intervention on levels of brooding and reflection and symptoms of posttraumatic stress, depression and anxiety at post-test and follow-up.

Our predictions were substantially confirmed. Completers analyses indeed showed exposure strongly reduced grief rumination and complicated grief at post-test and three month follow-up. Additionally, moderate to large effects of exposure were detected on symptom levels of depression, posttraumatic stress and anxiety, and on brooding at post-test, but not at follow-up. Completers analyses did not show any results for behavioral activation, apart from large effects on reflection and brooding at post-test. Since all conditions suffered from dropout (exposure: 33%; behavioral activation: 59%; waiting-list: 17%), we also conducted intention-to-treat analyses using multilevel regression models (Hox, 2002). The intention-to-treat analyses generally confirmed the results for the exposure condition. Additionally, these analyses suggested behavioral activation could potentially have beneficial effects, since this treatment yielded large reductions in levels of complicated grief, posttraumatic stress and grief rumination at each time-point.

### **Intervention: reflections on results and directions for future research**

Our intervention study showed that exposure resulted in significant and large reductions in grief rumination and complicated grief levels at posttest and follow-up in both completers analyses as intention-to-treat analyses. As such, this study provides yet another piece of support for the claim that rumination may serve an avoidant function (RAH: Stroebe et al., 2007). However, behavioral activation also resulted in large effects on grief rumination and complicated grief symptom levels in the intention-to-treat analyses, but not the completers analyses.

The effects of both interventions on the intention-to-treat analyses, fit nicely with earlier research. For instance, the effects of the interventions on complicated grief symptoms is in line with the proven effectiveness of cognitive behavioral therapies for complicated grief that includes exposure techniques (e.g., Boelen et al., 2007; Wagner et al., 2006), and with an open trial that demonstrated the effectiveness of behavioral activation in reducing loss-related distress (Papa et al., 2013a). The observed large decreases in grief rumination in both treatment groups, also corresponds with other research. For instance, it is in line with a study that showed behavioral activation was effective in decreasing levels of worry in a community sample (Chen, Liu, Rapee, & Pillay, 2013), and the finding that written exposure for posttraumatic stress disorder significantly decreased rumination (Wisco et al., 2013). While the pattern of findings in our intervention study provided more consistent support for the effectiveness of exposure, we did not have strong indications that exposure is more effective than behavioral activation in reducing rumination.

Several explanations may account for the fact that both exposure and behavioral activation were (potentially) effective in ameliorating rumination and loss-related distress. One explanation

may be that there could be more than one road to breaking a ruminative cycle. In fact, beneficial effects on worry and rumination have been found in randomized controlled trials with various other interventions (apart from exposure and behavioral activation), including mindfulness meditation (Jain et al., 2007), metacognitive therapy (van der Heiden, Muris, & van der Molen, 2012), and rumination-focused therapy (Watkins et al., 2011). However, these interventions could share common working mechanisms with exposure and behavioral activation. For instance, mindfulness meditation increases confrontation with, and acceptance of, negative emotions, and attention exercises could provide distraction from ruminative thoughts. Similarly, rumination-focused therapy includes some behavioral activation exercises, and its effects could therefore partly be due to positive distraction that is provided by engaging in these new activities.

Another explanation may be that while exposure and behavioral activation were designed to achieve different goals, that is, confronting painful aspects of the loss and increasing engagement in fulfilling activities, working towards one goal may help in achieving the other. For example, as part of a behavioral activation exercise a widow could decide to do more social activities that were previously done together with the deceased partner. Of course, this could lift her mood and reduce time she has available for rumination, but she would also be confronted with the permanence of the separation from her partner. Vice versa, during an exposure exercise, a widower could decide to visit places that are now avoided because they elicit reminders of his deceased wife, such as walking on the beach. By doing this exercise he would confront the reality of the loss and this could reduce distress, but simultaneously it could remind him how much fun it was to take a walk on the beach, which could inspire him to go on long walks more often with others. This explanation is in line with the Dual Process Model of coping with loss, which holds that flexible oscillation between grief-oriented coping and restoration-oriented coping is important for healthy adjustment to bereavement (Stroebe & Schut, 1999, 2010).

A third explanation that could explain our findings could be that there may be a single working mechanism that partly explains the effectiveness of both exposure and behavioral activation in reducing rumination. One potential unifying view could be that any therapy that strongly decreases the recurrent experience of negative emotions, effectively takes away a motive for rumination. In support of this view, many influential theories of rumination hold that negative mood elicits ruminative thought (e.g., Martin & Tesser, 1996; Nolen-Hoeksema et al., 2008), so reducing aversive emotions could lead to decreases in ruminative coping.

Of course, these arguments are largely theoretical, and are in need of further research. Specifically, since our sample size was small, and our findings should be replicated in randomized controlled trials in a larger bereaved sample, which would allow a formal comparison of both treatment strategies, and mediation analyses of therapy effectiveness. This would provide the much needed more stringent tests of the potential mechanisms that ameliorate rumination in bereaved individuals.

In addition to these therapy studies, the function of rumination could be further examined in (combinations of) experimental and longitudinal investigations. One potential way of doing this, would be to randomly allocate bereaved individuals with low to high levels of rumination and loss-related distress to three conditions. In each condition, participants would be instructed to retrieve a memory to an emotional loss-related event. Next, three different instructions would be given. In the first condition, people would be instructed to engage in grief rumination about the event. In the second condition, subjects would be asked to engage in an exposure exercise about the remembered event. In the third condition, participants would be distract themselves from the event, for instance by thinking about other topics (cf. Lyubomirsky & Nolen-Hoeksema, 1993). Next, over a period of several days, state rumination and loss-related distress would be assessed at several time-points, possibly through the use of mobile phone applications. Following RAH (Stroebe et al., 2007), the main prediction would be that the exposure condition would lead to the strongest and most enduring reductions of levels of rumination and loss-related distress, relative to the other conditions.

### **Rumination: confrontation or avoidance?**

In conclusion, a compelling case can be made for the theory that rumination serves to avoid painful aspects of the loss and the negative emotions linked with it. At present, we cannot completely rule out alternative explanations, but the results of our studies quite consistently corroborate the Rumination as Avoidance Hypothesis (RAH: Stroebe et al., 2007). As such, these investigations provide an extensive evidentiary base for a theory that challenges the commonly held idea that rumination after loss is (only) a maladaptive confrontation process (Nolen-Hoeksema, 2001).

An important issue, that has not been addressed explicitly in this discussion, is whether rumination is avoidance, confrontation, or, ultimately, both. Theoretical accounts and our present empirical results seem to support that rumination can be both confrontation *and* avoidance. For example, RAH and our suppression hypothesis each propose that a repetitive focus on the causes and consequences of a loss and loss-related emotions, serves as a distraction from more threatening cognitive content (Stroebe et al., 2007; Chapter 4). Some of our findings are in line with this view. For instance, in the eye-tracking study, high ruminators showed conscious attentional avoidance of stimuli that represent the loss, but at the same time showed an attentional preference for more benign negative stimuli. Similarly, exposure was effective in ameliorating rumination, but we also found that ruminative coping could be reduced by behavioral activation. So, while researchers have often viewed rumination as being confrontation *or* avoidance, our data suggests that rumination is confrontation *and* avoidance. Leading questions for any future project on rumination in the aftermath of a loss, should therefore not only be whether rumination is avoidance. Instead, these projects could also focus on the following questions: How, when and for whom does rumination serve as avoidance? What are the relative long-term effects of confrontation and avoidance through rumination? How can rumination most effectively be reduced?

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## **Samenvatting**

Dutch summary

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## **Curriculum Vitae**

## **Publications**

## **Appendices**



Het overlijden van een dierbare kan een ontwrichtende en stressvolle gebeurtenis zijn. Hoewel de meeste nabestaanden zich zonder professionele hulp aanpassen aan de nieuwe situatie die ontstaat na een verlieservaring, leidt deze gebeurtenis bij een minderheid tot ernstige en langdurige fysieke en mentale gezondheidsproblemen. Het verlies van een dierbare is bijvoorbeeld gerelateerd aan lichamelijke gebreken, pijn, gewichtsverlies en een verhoogde kans op ziekenhuisopname en zelfs overlijden, wat ook wel 'sterven van een gebroken hart' wordt genoemd. Het kan tevens leiden tot verschillende psychische klachten, waaronder de ontwikkeling van een depressieve stoornis, posttraumatische stressstoornis of langdurige rouwreacties. Verschillende onderzoekers hebben voorstellen gedaan voor een psychiatrische stoornis die gekenmerkt wordt door chronische rouwreacties. Een van de meest invloedrijke voorstellen is gedaan door Prigerson en collega's (2009). Volgens deze groep onderzoekers is er sprake van 'gecompliceerde rouw' als een nabestaande aanhoudende emotionele klachten ervaart ten gevolge van een verlies en problemen ervaart met de acceptatie en het omgaan met de gevolgen van een verlies. Deze klachten dienen ten minste zes maanden na het overlijden te bestaan en gepaard te gaan met aanzienlijk lijden en een beperkt dagelijks functioneren.

Gegeven de uiteenlopende reacties van nabestaanden op een verlieservaring, is het belangrijk om in kaart te brengen welke factoren een rol spelen bij het ontwikkelen en in stand houden van psychische klachten na verlies, zodat hierop ingespeeld kan worden in psychologische hulpverlening. Een van de factoren die de psychische klachten die mensen ervaren na verlies lijkt te versterken, is rumineren. Rumineren wordt door ons omschreven als repetitief en terugkerend nadenken over de oorzaken en gevolgen van het verlies en daaraan gerelateerde gevoelens. Mensen die rumineren na verlies denken bijvoorbeeld na over waarom het verlies heeft plaatsgevonden, wat de betekenis van het verlies is en waarom zij zich op een bepaalde manier voelen over het verlies. Eerder onderzoek heeft getoond dat nabestaanden die meer rumineren, zowel op hetzelfde moment als over tijd meer depressieve en gecompliceerde rouwsymptomen ervaren.

Om de meest effectieve hulp te kunnen bieden aan nabestaanden die ernstige psychische klachten ervaren, is het belangrijk om rumineren helder te conceptualiseren en om beter te begrijpen op welke manier rumineren effect heeft op het rouwproces. In dit onderzoeksproject hebben we daarom geprobeerd om drie onderling samenhangende doelen te bereiken. Het eerste doel was om rumineren na een verlieservaring te definiëren en om een betrouwbaar en valide instrument te ontwikkelen om het te meten. Het tweede doel was om te verhelderen welke werkzame mechanismen de negatieve gevolgen van rumineren mogelijk verklaren. Het laatste doel was om (op basis van de verkregen informatie in de twee voorgaande stappen) verschillende vormen van psychologische hulp bij verliesverwerking die rumineren en gecompliceerde rouwklachten mogelijk zouden kunnen verminderen te ontwikkelen en te testen.

## Het meten van rumineren na een verlieservaring

Toen we aan dit onderzoeksproject begonnen, bestond er geen gevalideerd instrument om rumineren na een overlijden mee te meten. Daarom was een eerste doel om een vragenlijst te ontwikkelen die ruminatieve gedachten meet die vaak voorkomen bij nabestaanden.

Een belangrijke achtergrond voor de ontwikkeling van deze nieuwe schaal was de zelfreguleringstheorie van rumineren. Deze theorie veronderstelt dat rumineren een denkstijl is die erop gericht is om verschillen tussen een gewilde, maar nog niet bereikte toestand en de huidige toestand te verkleinen. Zo zullen mensen die depressief zijn, herhaaldelijk rumineren over de onheldere oorzaken van hun depressieve stemming, zodat zij deze oorzaken beter kunnen begrijpen en hun stemming mogelijk kunnen verbeteren, wat ook wel depressief rumineren wordt genoemd. Bij nabestaanden zijn veel van de verschillen tussen hun gewenste en huidige toestand onlosmakelijk verbonden met het overlijden van een dierbare. Het is daarom logisch dat rumineren na een verlieservaring gekenmerkt wordt door gedachten over de oorzaken en gevolgen van het overlijden. In overeenstemming met dit idee toonden eerdere onderzoeken aan dat zowel depressief rumineren als rumineren over het verlies psychische gezondheidsproblemen bij nabestaanden voorspelt.

Zowel op theoretische als empirische gronden leek het dus gerechtvaardigd om rouwrumineren, dat wij breed definieerden als repetitief en terugkerend nadenken over de oorzaken en gevolgen van een overlijden en daaraan gerelateerde gevoelens, te bestuderen. In Hoofdstuk 2 en 3 presenteerden wij daarom twee onderzoeken gericht op het ontwikkelen en valideren van de Utrechtse Rouw Ruminatie Schaal (URRS), een nieuwe vragenlijst voor rouwrumineren.

In Hoofdstuk 2 beschreven wij een cross-sectioneel vragenlijstonderzoek naar de eigenschappen van de URRS dat werd uitgevoerd bij 204 Engelse en 316 Nederlandse nabestaanden die recent een eerstegraads familielid hadden verloren. In deze studie werd met behulp van vergelijkende factoranalyses aangetoond dat een gecorreleerd vijffactorenmodel de structuur van de URRS het beste beschrijft, en dat deze structuur vergelijkbaar is in beide taalgroepen. De gegevens ondersteunden daarnaast de betrouwbaarheid van de URRS en zijn vijf subschalen (rumineren over betekenis, gevoelens, sociale relaties, onrecht en tegen-feitelijk redeneren) en de constructvaliditeit van de URRS.

Aangezien het onderzoek in Hoofdstuk 2 beruiste op dataverzameling op één meetmoment, en hoofdzakelijk gericht was op het onderzoeken van de validiteit van de algemene neiging tot rouwrumineren (gemeten met de totaalscore op de URRS), werd in Hoofdstuk 3 onderzoek gedaan naar de voorspellende validiteit van de subschalen van de URRS. Hiertoe werd een longitudinale vragenlijststudie uitgevoerd met drie meetmomenten bij 242 nabestaanden die recent een eerstegraads familielid hadden verloren. We vergeleken de voorspellende waarde van de vijf subtypen van rouwrumineren met twee vormen van depressief rumineren voor symptoomniveaus van depressie en gecompliceerde rouw. Er werden aparte meervoudige

regressiemodellen voor rouwrumineren en depressief rumineren op symptoomniveaus op verschillende tijdstippen opgesteld.

Een aanvullend doel van deze studie was om te verhelderen of adaptieve en niet-adaptieve vormen van rumineren na een verlieservaring kunnen worden onderscheiden. Overzichten van wetenschappelijke literatuur toonden dat verschillende kenmerken van repetitieve gedachten bepalen welk effect dergelijke gedachten hebben. Zo speelt de lading van repetitieve gedachten een belangrijke rol; Negatieve gedachten hebben over het algemeen schadelijker gevolgen dan neutrale of positieve gedachten. Een ander kenmerk dat de effecten van repetitief denken mede bepaalt is het abstractieniveau van de gedachten; Abstracte gedachten leiden doorgaans tot schadelijker gevolgen dan concrete gedachten. Abstracte gedachten worden gekenmerkt door globale, overkoepelende mentale representaties die de algemene betekenis van gebeurtenissen en acties beschrijven. Concrete gedachten worden daarentegen gekenmerkt door ondergeschikte, specifieke, incidentele details van gebeurtenissen en acties. Het abstractieniveau van repetitief denken kan op verschillende manieren negatieve effecten hebben op psychische gezondheid, bijvoorbeeld doordat abstract denken het oplossen van problemen belemmert, terwijl concreet denken dit vereenvoudigt.

De resultaten van de studie beschreven in Hoofdstuk 3 ondersteunden de voorspellende validiteit van de verschillende vormen van rouwrumineren, aangezien de scores op de meeste URRS subschalen gerelateerd waren aan (veranderingen in) symptoomniveaus van depressie en gecompliceerde rouw. Subtypen van rouwrumineren vertoonden bovendien een sterkere samenhang met psychische gezondheidsklachten dan subtypen van depressief rumineren. In overeenstemming met de hierboven besproken theorieën, bleek de meest schadelijke vorm van rumineren gekenmerkt door negatieve, relatief abstracte gedachten over de onrechtvaardigheid van het verlies en het zich voorstellen van alternatieve realiteiten waarin het overlijden niet had plaatsgevonden. Adaptieve vormen van rumineren werden daarentegen gekenmerkt door neutrale, relatief concrete gedachten die erop gericht waren depressieve en verliesgerelateerde gevoelens beter te begrijpen.

### **Conclusie en discussie**

Het onderzoek beschreven in Hoofdstuk 2 en 3 ondersteunde de betrouwbaarheid en validiteit van de Nederlandstalige en Engelstalige URRS. Resultaten stemden overeen met een eerdere validatiestudie die werd uitgevoerd in een Nederlandstalige steekproef van nabestaanden en een andere studie beschreven in Hoofdstuk 4. Het belang van het onderscheiden van rouwrumineren en andere ruminatieve gedachten werd in deze studies ondersteund, onder andere omdat rouwrumineren een betere voorspeller bleek van veranderingen in psychische gezondheid dan andere vormen van rumineren. Samenvattend bevestigt ons onderzoek de potentiële waarde van de URRS als een meetinstrument om rouwrumineren te meten in wetenschappelijk onderzoek en in de klinische praktijk.

Enkele kanttekeningen zijn niettemin op hun plaats. Ten eerste zijn de effectgrootten van de relaties tussen rouwrumineren en verandering in psychische klachtenniveaus over tijd relatief klein. In een eerder onderzoek naar de effecten van depressief rumineren op verandering in depressieve symptoomniveaus over tijd, werd een groter effect gevonden. Dit verschil wordt echter waarschijnlijk verklaard door methodologische verschillen tussen dit onderzoek en de studies die hier zijn beschreven. Een eerste verschil was dat deze eerdere studie bij nabestaanden vanaf een maand na hun verlies op vaste tijdstippen informatie werd verzameld, terwijl in onze onderzoeken alle nabestaanden mochten deelnemen die in de afgelopen drie jaar een eerstegraads familielid hadden verloren. In de steekproef van deze oudere studie vonden er hierdoor waarschijnlijk meer veranderingen plaats in de niveaus van psychische klachten over tijd, waardoor een groter effect werd gevonden van rumineren. Een tweede verschil is dat er in deze oudere studie gestructureerde interviews werden gebruikt om rumineren en depressieve symptomen te meten, terwijl er in onze studies gebruik gemaakt werd van vragenlijsten. Het kan zijn dat interviews een nauwkeuriger schatting opleverden van de niveaus van deze variabelen dan een vragenlijst. Ten derde gebruikten wij strengere schattingsmethoden in onze analyses, bijvoorbeeld door te controleren voor kenmerken van het verlies, hetgeen de omvang van effecten heeft gedrukt.

Het is bij het interpreteren van de resultaten van Hoofdstuk 3 tevens belangrijk op te merken dat de subschalen van de URRS weliswaar varieerden op de dimensies die het effect van repetitieve gedachten mogelijk verklaren (lading, abstractheid), maar dat deze vragenlijst niet specifiek ontworpen was om deze dimensies te meten. Dit betekent dat de URRS wellicht niet perfect is afgestemd voor onderzoek naar deze kenmerken van repetitief denken. Er bestaat hierdoor ruimte om de URRS te verbeteren, bijvoorbeeld door meer negatief geladen ruminatieve gedachten te meten.

Tenslotte werd er in het onderzoek beschreven in Hoofdstuk 2 en 3 uitsluitend gebruik gemaakt van vragenlijsten om de onderzoeksvragen te beantwoorden. Een belangrijk doel voor toekomstig onderzoek is daarom om vast te stellen in hoeverre andere onderzoeksmethoden vergelijkbare resultaten opleveren. Het zou bijvoorbeeld interessant kunnen zijn om de relatie tussen depressief rumineren en rouwrumineren, stemming en mentale klachten over tijd te onderzoeken met behulp van 'ecological momentary assessment' (EMA). EMA betreft het herhaaldelijk meten van menselijk gedrag in het huidige moment in de natuurlijke omgeving van een persoon, bijvoorbeeld door het gebruik van een mobiele telefoonapplicatie. Dit maakt het mogelijk om de micro-processen die dagelijks gedrag beïnvloeden te verhelderen en kan daarmee een ander licht werpen op de rol van rumineren na een verlieservaring.

### **Werkzame mechanismen van rumineren na een verlieservaring**

Zoals hierboven kort genoemd, is een goed begrip van de wijze waarop rumineren bijdraagt aan psychische gezondheid na een verlies belangrijk, omdat dit aanwijzingen kan bieden voor

psychologische hulp voor nabestaanden. Wetenschappelijke literatuur over dit onderwerp biedt echter geen eenduidige conclusies over de werkzame mechanismen die de effecten van rumineren verklaren. Tot voor kort veronderstelden onderzoekers vaak dat rumineren schadelijke effecten heeft omdat het een confrontatieproces is. Andere onderzoekers stelden echter dat rumineren dient als een vermijdingsstrategie.

Een invloedrijke onderzoeker die rumineren als een confrontatieproces beschouwde, was Nolen-Hoeksema. Zij en haar collega's beschreven rumineren herhaaldelijk als een "tegenpool" van ontkenning en onderdrukking en benadrukten relatief recent nog dat rumineren volgens hen geen cognitieve vermijdingsstrategie is. Volgens haar invloedrijke Responsstijlentheorie (RST) leidt een herhaaldelijke focus op negatieve onderwerpen door middel van rumineren tot het persisteren van depressie, omdat het: i) de toegankelijkheid van negatieve gedachten vergroot, ii) problemen oplossen belemmert, iii) instrumenteel gedrag vermindert en iv) sociale steun inperkt.

Een andere groep onderzoekers, Stroebe en collega's (2007), opperden echter, op basis van een overzicht van wetenschappelijke literatuur, de 'Rumination as Avoidance Hypothesis' (RAH). Deze hypothese houdt in dat chronisch rumineren dient als afleiding en ontkenning van de pijnlijkste kenmerken van een verlieservaring, zoals de onomkeerbaarheid van het verlies. De vermijding van het verlies kan vervolgens leiden tot problemen met het accepteren van het overlijden, hetgeen bijdraagt aan complicaties in het rouwproces.

Onderzoek naar deze contrasterende theorieën over rumineren is niet alleen theoretisch, maar ook klinisch relevant. Deze theorieën bieden namelijk verschillende richtlijnen voor de klinische praktijk. Als rumineren negatieve gevolgen heeft voor de psychische gezondheid omdat het een confrontatieproces is, kan het aanbieden van positieve, afleidende activiteiten een effectieve manier zijn om rumineren en psychische klachten na verlies te verminderen. Als chronisch rumineren echter een strategie is om de realiteit van het verlies te vermijden, is het waarschijnlijk effectiever om mensen te confronteren met de meest pijnlijke aspecten van een verlies door middel van blootstellingsoefeningen.

Toen dit onderzoeksproject begon, was er in enkele vragenlijststudies een samenhang aangetoond tussen rumineren en cognitieve vermijdingsstrategieën, zoals het onderdrukken van gedachten. Er bestonden echter geen studies naar het verband tussen rumineren, vermijdingsprocessen en psychische gezondheid over tijd. Om vast te kunnen stellen of vermijding mogelijk dient als werkzaam mechanisme in de relatie tussen rumineren en toenames in psychische klachten bij nabestaanden, was longitudinaal onderzoek nodig. Aangezien sommige studies tonen dat nabestaanden zich niet altijd volledig bewust zijn van het vermijdende gedrag dat zij vertonen, was het ook belangrijk om de relatie te bestuderen tussen rumineren na verlies en (impliciete) gedragsmatige maten voor vermijding en toenadering. In Hoofdstuk 4, 5 en 6 presenteerden wij daarom drie geïntegreerde studies waarin wij de werkzame mechanismen van rumineren nader onderzochten.

In Hoofdstuk 4 beschreven wij een longitudinale vragenlijststudie met drie meetmomenten waaraan 282 nabestaanden deelnamen die recent een eerstegraads familielid hadden verloren. Het hoofddoel van dit onderzoek was om te testen of en hoe vermijding de relaties tussen rumineren enerzijds en veranderingen in niveaus van depressie en gecompliceerde rouw anderzijds verklaart. Een belangrijk resultaat van deze studie was dat zowel experiëntiële vermijding (vermijding van interne ervaringen zoals herinneringen, gedachten en gevoelens) en het onderdrukken van gedachten de relatie tussen rumineren en veranderingen in gecompliceerde rouwsymptomen verklaarde. Daarnaast bleken experiëntiële vermijding en de vermijding van activiteiten de relatie tussen rouwrumineren en verandering in depressieve symptomen te verklaren.

In Hoofdstuk 5 werd een eye-tracking onderzoek beschreven dat was uitgevoerd in een steekproef van 54 nabestaanden, die wij onderverdeelden in mensen die veel en weinig rumineren. We onderzochten de aandachtsprocessen op korte en lange termijn voor verliesstimuli (foto overledene + verlieswoord), verliesgerelateerde stimuli (foto overledene + negatief woord; foto overledene + neutraal woord; foto vreemde + verlieswoord), en niet-verliesgerelateerde stimuli (foto vreemde + negatief woord; foto vreemde + neutraal woord), die herhaaldelijk, willekeurig en paarsgewijs 10 seconden werden getoond op een scherm. In overeenstemming met de veronderstelling dat rumineren een cognitief vermijdingsproces is, voorspelden wij dat mensen die veel rumineren, vergeleken met mensen die weinig rumineren, onbewust (voor 1500ms) meer aandacht zullen vertonen voor verliesstimuli, waarna zij bewust (na 1500ms) hun aandacht van verliesstimuli zullen afwenden, en naar negatieve niet-verliesgerelateerde stimuli zullen kijken. Deze voorspellingen werden deels ondersteund. Nabestaanden die veel rumineren, vergeleken met nabestaanden die weinig rumineren, bleken geen onbewuste verhoogde aandacht te vertonen voor verliesstimuli, maar keken wel bewust minder naar verliesstimuli en meer naar negatieve (en neutrale) niet-verliesgerelateerde stimuli. Dit laatste patroon werd eveneens gevonden wanneer gekeken werd naar gemiddelde fixatietijden (hoe lang nabestaanden gemiddeld per keer naar verschillende soorten stimuli kijken). Deze effecten bleven intact nadat werd gecontroleerd voor symptoomniveaus van depressie en gecompliceerde rouw.

In Hoofdstuk 6 werd een studie beschreven die erop gericht was te verhelderen wat de relatie is tussen rumineren en impliciet toenaderings- en vermijdingsgedrag, gemeten met een 'Approach Avoidance Task'. Vierenzeventig nabestaanden werden gevraagd om stimuli op een computerscherm zo snel mogelijk van zichzelf af te duwen of naar zich toe te trekken op basis van een irrelevante stimuluseigenschap (de kleur van een woord). Duwt een persoon een stimulus relatief sneller van zich af dan dat hij een stimulus naar zich toetrekt, dan is er sprake van impliciete vermijding, terwijl een omgekeerd patroon duidt op impliciete toenadering. Er werden opnieuw verschillende stimuli gebruikt: verliesstimuli (foto overledene + verlieswoord), verliesgerelateerde stimuli (foto overledene + neutraal woord; foto vreemde + verlieswoord) en neutrale stimuli (foto vreemde + neutraal woord; puzzelfoto). In overeenstemming met de vermijdingshypothese van rumineren bleek rumineren impliciete vermijding van verliesstimuli (maar niet van andere stimuli) te voorspellen, ook wanneer er gecontroleerd werd voor

symptomen van depressie en posttraumatische stress, maar niet nadat gecontroleerd werd voor symptomen van gecompliceerde rouw.

### **Conclusie en discussie**

De studies beschreven in Hoofdstuk 4, 5 en 6 vormen cruciale stappen in het beter begrijpen van de functie van rumineren na een verlieservaring. Vermijdingsprocessen bleken mogelijk te kunnen dienen als het werkzame mechanismen in de relatie tussen rumineren en verandering in psychische gezondheid na verlies. Daarnaast bleek dat rumineren een unieke relatie had met vermindering van (de realiteit van) een verlies in twee gedragsmatige taken, zelfs nadat gecontroleerd werd voor symptoomniveaus van verschillende psychische stoornissen. Deze serie onderzoeken biedt ondersteuning voor de hypothese dat rumineren een vermijdingsproces is, en suggereert daarnaast dat er een mogelijk oorzakelijk verband is tussen rumineren, vermindering en de psychische gezondheid van nabestaanden. Niettemin is het belangrijk om enkele kanttekeningen te plaatsen die deze conclusie nuanceren.

Een eerste kanttekening is dat deze studies geen sluitend bewijs bieden voor een oorzakelijk verband tussen rumineren en vermindering. Het sterkste bewijs hiervoor wordt geleverd door de longitudinale vragenlijststudie, waarin wordt aangetoond dat rumineren vermindering over tijd voorspelt. Er zijn echter meerdere mogelijke alternatieve verklaringen voor deze relatie. Het zou bijvoorbeeld zo kunnen zijn dat een derde factor het verband tussen rumineren en vermindering verklaart. Vermijding en rumineren worden bijvoorbeeld allebei beschouwd als passieve copingstrategieën. Het is daarom mogelijk dat een persoon die over het algemeen geneigd is om op een passieve manier te reageren op problemen, zowel vaker zal rumineren als vermijden. Aangezien wij in deze studies dergelijke alternatieve verklaringen niet uit kunnen sluiten, adviseren wij voor toekomstig onderzoek het gebruik van een volledig gecontroleerd experiment om de relatie tussen rumineren en vermindering verder te verhelderen.

Een andere alternatieve verklaring voor onze resultaten is dat het niet zo is dat rumineren zelf een vermijdingsstrategie is, maar dat er wederkerige relaties bestaan tussen rumineren en vermindering. Wij stelden in Hoofdstuk 4 bijvoorbeeld voor dat rumineren mogelijk dient als de gedachte-inhoud die mensen gebruiken om andere, meer bedreigende gedachten te onderdrukken. Er zijn echter ook onderzoekers die stellen dat mensen juist proberen te ontsnappen aan ruminatieve gedachten door deze te onderdrukken, hetgeen vervolgens zou kunnen leiden tot een verhoogde toegankelijkheid van deze gedachten. Hoewel deze alternatieve lezing op dit moment niet volledig kan worden uitgesloten, lijken de resultaten van de eye-tracking studie deze verklaring deels te ontcrachten. In deze studie toonden mensen die veel rumineren vergeleken met mensen die weinig rumineren minder aandacht voor verliesstimuli terwijl zij gelijktijdig meer aandacht schonken aan negatieve niet-verliesgerelateerde stimuli. Dit lijkt erop te wijzen dat de realiteit van het verlies mogelijk vermeden wordt door ruminerende nabestaanden door aandacht te schenken aan minder bedreigend materiaal.

Het is tevens belangrijk om te onderkennen dat hoewel wij in verschillende studies een relatie tussen rumineren en vermijding vonden, het vooralsnog onduidelijk is via welk mechanisme rumineren een bijdrage levert aan vermijding. Hoewel in Hoofdstuk 4 enkele voorstellen worden gedaan over deze relatie (zoals het hiervoor genoemde voorstel dat rumineren een rol speelt in het onderdrukken van gedachten), vormen onze studies geen formele test van deze mechanismen. Anders gezegd: de studies in dit proefschrift hebben getoond *wat* nabestaanden die rumineren mogelijk vermijden, maar niet hoe deze vermijding plaatsvindt. In toekomstige studies zullen de voorgestelde relaties tussen rumineren en vermijding in meer detail onderzocht moeten worden.

Naast de bovengenoemde kanttekeningen is het belangrijk om de bredere relevantie van het onderzoek beschreven in Hoofdstuk 4, 5 en 6 voor andere gebieden van klinische psychologie te belichten. Het idee dat rumineren een vermijdingsstrategie is, komt voort uit literatuur over rumineren na een traumatische gebeurtenis en piekeren in gegeneraliseerde angststoornis. Het is dan ook logisch dat ons onderzoek gevolgen heeft voor het begrip van repetitief denken in deze onderzoeksgebieden.

Ons onderzoek zou bijvoorbeeld gevolgen kunnen hebben voor een begrip van rumineren na een traumatische gebeurtenis. Het overlijden van een dierbare is een van de meest stressvolle gebeurtenissen die een mens kan meemaken. Daarnaast wordt rumineren na een traumatische ervaring deels gekenmerkt door vergelijkbare gedachten als rouwrumineren, namelijk door gedachten over waarom de gebeurtenis plaatsvond en hoe deze voorkomen had kunnen worden. Hoewel prominente onderzoekers op het gebied van post-traumatische stress hebben gesuggereerd dat rumineren na een trauma kan dienen als cognitieve vermijding, is hier weinig onderzoek naar gedaan. Een uitzondering is een studie waarin werd aangetoond dat overlevenden van een auto-ongeluk die meer rumineerden, minder sterke fysiologische reacties (veranderde hartritmereactiviteit) toonden tijdens het ophalen van een herinnering aan het ongeluk. Een theoretisch en klinisch relevante stap in vervolgonderzoek zou daarom kunnen zijn om te verhelderen of onze bevindingen gerepliceerd kunnen worden bij personen die andere potentieel traumatische gebeurtenissen hebben meegemaakt, zoals een auto-ongeluk, een natuurramp of geweld.

Tenslotte is het belangrijk te onderkennen dat als rumineren mogelijk vermijding veroorzaakt, dit niet automatisch betekent dat een afname in vermijding ook leidt tot een vermindering van rumineren. Een cruciale laatste stap in dit onderzoeksproject was daarom om de klinische implicaties van ons onderzoek te toetsen. Naast het ontrafelen van de relatie tussen rumineren en vermijding en toenadering, was een doel van dit project om vast te stellen in hoeverre blootstelling en activering effectieve therapeutische strategieën zijn om rumineren en psychische klachten bij nabestaanden te verminderen.

## **Interventie voor rumineren na een verlieservaring**

Zoals genoemd, leiden de verschillende theorieën over de werkzame mechanismen van rumineren tot contrasterende richtlijnen voor de klinische praktijk. Als rumineren een vermijdingsproces is, zal blootstelling aan pijnlijke aspecten van het verlies een effectieve behandelstrategie kunnen zijn. Is rumineren echter een confrontatieproces, dan kan het ondernemen van nieuwe plezierige activiteiten een effectieve manier zijn om rumineren te verminderen. Het testen van de effectiviteit van deze behandelstrategieën dient dus een tweeledig doel: Het vormt zowel een toets van de werkzame mechanismen van rumineren na een verlieservaring als een toets van de klinische implicaties van beide theorieën.

Er bestaat veel bewijs voor de werkzaamheid van blootstellingstherapie voor het verminderen van psychische klachten na een verlieservaring. Meerdere gecontroleerde therapeutische effectstudies toonden dat therapeutische behandelingen waarin gebruik werd gemaakt van blootstellingsoefeningen niveaus van uiteenlopende psychische klachten, waaronder gecompliceerde rouw, verminderde. Een zeer recente studie toonde eveneens dat gedragsactivering, het gradueel ondernemen van plezierige en belonende activiteiten, verminderingen teweegbracht in niveaus van depressie, posttraumatische stress en gecompliceerde rouw. Hoewel er voor beide behandelvormen daarnaast enige aanwijzingen bestonden dat zij rumineren mogelijk verminderen, waren er nog geen gecontroleerde effectstudies uitgevoerd naar het effect van deze behandelingen op rumineren na een verlieservaring.

In Hoofdstuk 7 werd een gecontroleerde effectstudie beschreven die werd uitgevoerd onder 47 nabestaanden met verhoogde niveaus van rumineren en gecompliceerde rouw, waarin de effectiviteit van een 6-weekse blootstellingsbehandeling en 6-weekse gedragsactivering werd vergeleken met een wachtlijstgroep. Voor, na en drie maanden na het afronden van de behandeling werden de niveaus van psychische klachten (gecompliceerde rouw, posttraumatische stress, depressie en angst) en rumineren (depressief rumineren en rouwrumineren) gemeten. Vanwege onze beperkte steekproefgrootte, konden wij de effectiviteit van beide behandelingen niet onderling vergelijken. Aangezien er bewijs bestond voor de mogelijke effectiviteit van beide behandelingen, voorspelden wij dat beide behandelingen effectief zouden zijn in het verminderen van psychische klachten en rumineren (en met name gecompliceerde rouw en rouwrumineren) in vergelijking tot de wachtlijstgroep.

Onze voorspellingen werden grotendeels bevestigd. Deelnemers die de blootstellingsbehandeling afronden, toonden sterke verminderingen op rouwrumineren en gecompliceerde rouw op de nameting en de vervolgmeting na drie maanden. Daarnaast werden er middelgrote tot sterke effecten van deze behandeling gevonden op niveaus van depressie, posttraumatische stress, angst en depressief rumineren op de nameting, maar niet op de vervolgmeting. Er werden geen consistente resultaten gevonden voor de personen die gedragsactivering afronden, behalve een effect op depressief rumineren op de nameting. Aangezien in beide

interventiegroepen een substantieel deel van de deelnemers voortijdig uitviel (blootstelling: 33%; gedragsactivering: 59%) werden er ook 'intention-to-treat' analyses uitgevoerd met behulp van multilevel regressiemodellen. In dergelijke modellen worden de gegevens van alle deelnemers, inclusief de deelnemers die voortijdig uitvielen of waarvoor geen data beschikbaar was op een of meerdere meetmomenten, gebruikt om de potentiële effecten in de hele steekproef te schatten. Deze analyses bevestigden de resultaten voor de blootstellingsgroep. Daarnaast suggereerden deze analyses dat ook gedragsactivering mogelijk positieve effecten heeft, omdat in deze groep sterke afnames werden geobserveerd voor gecompliceerde rouw, posttraumatische stress en rouwrumineren op de nameting en de vervolgmeting.

### Conclusie en discussie

De therapeutische effectstudie toonde dat blootstelling leidde tot consistente, significante en grote afnames in rouwrumineren en gecompliceerde rouw, zowel op de nameting als op de vervolgmeting. Dit ondersteunt de hypothese dat rumineren na een verlieservaring een vermijdingsstrategie is. Niettemin leidde ook gedragsactivering tot grote afnames in rouwrumineren en gecompliceerde rouw op de nameting en de vervolgmeting in de intention-to-treat analyses, maar niet in de analyses van gegevens van de mensen die de behandeling afronden.

De effecten van beide behandelingen in de intention-to-treat analyses stemmen overeen met resultaten van eerder onderzoek. De gevonden effectiviteit van de behandelingen sluit bijvoorbeeld aan bij verschillende gecontroleerde effectstudies die de effectiviteit van interventies met blootstellingstechnieken aantoonde, en bij een studie die de toonde dat gedragsactivering leidt tot verminderingen van verliesgerelateerde psychische klachten. De sterke afnames in rouwrumineren in beide behandelgroepen correspondeert ook met ander onderzoek. Zo werd in een gecontroleerde effectstudie gevonden dat gedragsactivering leidde tot afnames in piekeren in een niet-klinische steekproef, terwijl een andere gecontroleerde effectstudie toonde dat blootstellingstherapie bij mensen met een posttraumatische stressstoornis rumineren vermindert. Hoewel er eenduidiger bewijs werd gevonden voor de effectiviteit van blootstelling dan gedragsactivering, kunnen we op dit moment niet concluderen dat deze behandeling effectiever is in het verminderen van rumineren en psychische klachten na een verlieservaring.

Er zijn verschillende mogelijke verklaringen voor het feit dat zowel blootstelling als gedragsactivering (potentieel) effectief bleken in het verminderen van rumineren en psychische gezondheidsklachten bij nabestaanden. Een verklaring zou kunnen zijn dat er meerdere methoden zijn om rumineren te verminderen. Er bestaan verschillende behandelvormen die effect hebben op repetitieve gedachteprocessen, zoals mindfulness meditatie, metacognitieve therapie en rumination-focused therapie. Het zou echter ook zo kunnen zijn dat er slechts enkele manieren zijn om rumineren te verminderen en dat de genoemde behandelvormen werkzame mechanismen delen met blootstelling en gedragsactivering. Mindfulness meditatie bevordert

bijvoorbeeld de acceptatie van negatieve gevoelens en aandachtsoefeningen bieden tevens een afleiding van rumineren.

Een andere verklaring zou kunnen zijn dat hoewel blootstelling en gedragsactivering erop gericht waren andere doelen te bereiken, respectievelijk het confronteren van pijnlijke aspecten van het verlies en het ondernemen van belonende activiteiten, zou het werken aan het ene doel kunnen helpen het andere doel te bereiken. Het ondernemen van nieuwe activiteiten zou een nabestaande bijvoorbeeld kunnen confronteren met het feit dat haar partner er niet meer is. Andersom zou het bezoeken van een geliefde plaats die nu vermeden wordt, kunnen leiden tot het vaker bezoeken van deze plaats met anderen. Deze verklaring stemt overeen met het 'Dual Process Model' (DPM) van omgaan met een verlies. Het DPM stelt dat een flexibele wisseling tussen activiteiten die gericht zijn op het omgaan met het verlies en activiteiten die gericht zijn op leren omgaan met de nieuwe situatie na een verlies een gezond rouwproces kenmerken.

Een derde mogelijke verklaring is dat er slechts één mechanisme is dat de effectiviteit van zowel blootstelling als gedragsactivering verklaart. Een potentiële verklaring zou kunnen zijn dat iedere behandeling die de het ervaren van negatieve gevoelens vermindert, een belangrijke oorzaak van rumineren wegneemt. Verschillende invloedrijke theorieën over rumineren veronderstellen namelijk dat een negatieve stemming een belangrijke aanleiding is om te beginnen met rumineren. Mogelijk is er dus slechts een verbetering in de stemming van nabestaanden nodig om rumineren na verlies te verminderen.

Uiteraard zijn de bovenstaande argumenten vooral theoretisch en is er bovenal meer onderzoek nodig om de werking van deze behandelingen te verhelderen. Een goede eerste stap zou zijn om ons onderzoek te repliceren in een grotere steekproef van nabestaanden waardoor het mogelijk wordt de effectiviteit van beide behandelingen te vergelijken en tevens mediatieanalyses uit te voeren op het behandelingseffect. Op deze wijze zouden de manieren waarop rumineren kan worden verminderd scherper in kaart kunnen worden gebracht.

### **Rumineren: confrontatie of vermijding?**

Samenvattend leveren de studies in dit proefschrift overtuigend bewijs voor het idee dat rumineren dient om pijnlijke aspecten van het verlies en daaraan gerelateerde negatieve gevoelens te vermijden. Hoewel op dit moment alternatieve verklaringen niet compleet uitgesloten kunnen worden, bieden de resultaten van dit onderzoeksproject een relatief consistente empirische ondersteuning voor de Ruminaton as Avoidance Hypothesis (RAH). Daarmee daagt het de wijdverbreide veronderstelling uit dat rumineren na een verlieservaring (alleen) een schadelijk confrontatieproces is.

Tenslotte is het belangrijk om stil te staan bij een vraagstuk dat nog niet expliciet aan bod is gekomen: Is rumineren nu vermijding, confrontatie, of is het zowel confrontatie als vermijding? Theorieën en ook de onderzoeksresultaten in dit proefschrift lijken namelijk het idee te ondersteunen dat rumineren confrontatie *en* vermijding is. RAH stelt bijvoorbeeld dat

nabestaanden die chronisch rumineren zich herhaaldelijk richten op de oorzaken en gevolgen van een verlies en verliesgerelateerde gevoelens, waarmee zij zich afleiden van bedreigende gedachten over het verlies. Met andere woorden: doordat een persoon zich herhaaldelijk blootstelt aan ruminatieve gedachten, kunnen zij andere gedachte-inhoud vermijden. In onze studies vinden we enig bewijs voor dit idee. In de eye-tracking studie werd bijvoorbeeld gevonden dat mensen die veel rumineren bewust stimuli vermijden die het verlies representeren, en bij voorkeur kijken naar minder bedreigende negatieve stimuli. Op vergelijkbare wijze bleek dat rumineren verminderd kon worden door het gebruik van blootstellingstechnieken, maar dat gedragsactivering eveneens een potentieel effectieve behandeling voor rumineren was. Hoewel onderzoekers rumineren doorgaans beschouwen als confrontatie *of* vermijding, lijken onze bevindingen te suggereren dat rumineren een confrontatie *en* vermijding is. In toekomstig projecten over rumineren na een verlieservaring zouden daarom niet uitsluitend de vraag centraal moeten zijn of rumineren vermijding is. In plaats daarvan zouden de volgende vragen kunnen worden beantwoord: Hoe, wanneer en voor wie dient rumineren als een vermijdingsstrategie? Wat zijn de relatieve langetermijneffecten van confrontatie en vermijding door middel van rumineren? Hoe kan rumineren het meest effectief worden verminderd?

## **Samenvatting**

Dutch summary

## **Dankwoord**

Acknowledgements

## **Curriculum Vitae**

## **Publications**

## **Appendices**



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Maarten Eisma was born on the 14th of May 1982 in Nijmegen, the Netherlands. After finishing high school in 2000, he spent a year working and traveling in Australia and New Zealand and a year studying architecture at the Technical University Eindhoven. In 2002, due to a dwindling interest in building construction and a growing interest in human behavior, he moved to the north of the Netherlands to study psychology at the University of Groningen. In 2007, this resulted in a Master's degree in Clinical and Developmental Psychology. After briefly working as a researcher at a commercial research bureau, he set out for another trip, together with his girlfriend, Femke. During this journey, they ran a campground in France, worked with handicapped children in Bolivia, and boated, hiked and biked through nature reserves in several countries in South America. Running low on funds, and high on ambition, he applied for a job as a PhD-student at Utrecht University on a ZonMw project named 'Rumination after bereavement: Confrontation or avoidance?', the results of which can be read in this thesis. Currently he is working as a lecturer and postdoctoral researcher at the department of Clinical and Health Psychology at Utrecht University. He lives in Utrecht with Femke and they have an awesome son: Lars (1).



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- Eisma, M. C.**, Schut, H. A. W., Stroebe, M. S., Boelen, P. A., Stroebe, W., & van den Bout, J. (2014, June). *Discerning adaptive and maladaptive components of rumination after bereavement: A three-wave longitudinal investigation*. Oral presentation at the 10<sup>th</sup> International Conference on Grief and Bereavement in Contemporary Society, Hong Kong, China.
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## Awards

Best abstract award 10th International Conference on Grief and Bereavement in Contemporary Society, Hong Kong, China (2014)



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## APPENDIX CHAPTER 2

### UTRECHT GRIEF RUMINATION SCALE (ENGLISH AND DUTCH)

#### Thoughts about loss

People often think (of) diverse things after the death of a loved one. In the following questions we would like to know how often you have thought of the following things during the past month.

#### How frequently in the past month did you...

#### Never; Sometimes; Regularly; Often; Very often

1. ... think about the consequences that his/her death has for you.
2. ... analyze what the personal meaning of the loss is for you.
3. ... query whether you receive the right support from family members.
4. ... analyze whether you could have prevented his/her death.
5. ... ask yourself why you deserved this loss.
6. ... try to analyze your feelings about this loss precisely.
7. ... ask yourself whether you react normally to this loss.
8. ... ask yourself whether his/her death could have been prevented if the circumstances had been different.
9. ... ask yourself whether you get adequate support from friends and acquaintances.
10. ... ask yourself whether his/her death could have been prevented if others had acted differently.
11. ... wonder why this had to happen to you and not someone else.
12. ... think about the unfairness of this loss.
13. ... try to understand your feelings about the loss.
14. ... think about how you would like other people to react to your loss.
15. ... think how your life has been changed through his/her death.

#### Scoring instruction

The answer to every item is translated into a number. 'Never' is 1 point, 'Sometimes' is 2 points, 'Regularly' is three points, 'Often' is 4 points and 'Very often' is 5 points. The total score on grief rumination is calculated by adding all scores of each individual item. Moreover, the list consists of different subscales, which can be calculated separately by adding the scores of the items on each individual scale. Below the names of the scales and their items are listed.

|                                       |           |
|---------------------------------------|-----------|
| Rumination about meaning              | 1, 2, 15  |
| Rumination about social relationships | 3, 9, 14  |
| Counterfactual thinking               | 4, 8, 10  |
| Rumination about injustice            | 5, 11, 12 |
| Rumination about feelings             | 6, 7, 13  |

## Gedachten over verlies

Mensen denken vaak (aan) verschillende dingen na het verlies van een dierbare. In de volgende vragen willen wij graag weten hoe vaak je aan de volgende dingen hebt gedacht gedurende de afgelopen maand.

### Hoe vaak in de afgelopen maand...

#### Nooit, Soms, Regelmatig, Vaak, Zeer Vaak

1. ...dacht u na over de consequenties die het verlies voor u heeft.
2. ...analyseerde u wat de persoonlijke betekenis van het verlies voor u is.
3. ...vroeg u zichzelf af of u de juiste steun ontvangt van familieleden.
4. ...analyseerde u of u zijn/haar dood had kunnen voorkomen.
5. ...vroeg u zichzelf af waaraan u dit verlies heeft verdiend.
6. ...probeerde u uw gevoelens over dit verlies precies te analyseren.
7. ...vroeg u zichzelf af of u normaal op dit verlies reageert.
8. ...vroeg u zichzelf af of zijn/haar dood voorkomen had kunnen worden als de omstandigheden anders waren geweest.
9. ...vroeg je u zichzelf af of u adequate steun ontvangt van familie en vrienden.
10. ...vroeg je u zichzelf af of zijn/haar dood voorkomen had kunnen worden als anderen anders hadden gehandeld.
11. ...vroeg u zichzelf af waarom dit jou moest overkomen en niet iemand anders.
12. ...dacht u na over de oneerlijkheid van dit verlies.
13. ...probeerde u uw gevoelens over het verlies te begrijpen.
14. ...dacht u na over hoe je zou willen dat anderen zouden reageren op het verlies.
15. ...dacht u na over hoe jouw leven is veranderd door zijn/haar dood.

#### Scoringsinstructie

Het antwoord op ieder item wordt omgezet in een cijfer. 'Nooit' is 1 punt, 'Soms' is 2 punten, 'Regelmatig' is 3 punten, 'Vaak' is 4 punten en 'Zeer vaak' is 5 punten. De totaalscore op rouwruminatie wordt berekend door de afzonderlijke scores op alle items bij elkaar op te tellen. Daarnaast bestaat de lijst uit verschillende subschalen, die afzonderlijk berekend kunnen worden door de scores op de items die bij deze schaal horen bij elkaar op te tellen. Hieronder staan de schalen met de bijbehorende items weergegeven.

|                              |           |
|------------------------------|-----------|
| Rumineren over betekenis     | 1, 2, 15  |
| Rumineren over sociale steun | 3, 9, 14  |
| Tegen-feitelijk denken       | 4, 8, 10  |
| Rumineren over onrecht       | 5, 11, 12 |
| Rumineren over gevoelens     | 6, 7, 13  |

## APPENDIX CHAPTER 3

### SUPPLEMENTAL ANALYSES

**Table A** Associations between subtypes of depressive rumination and grief rumination on symptoms of complicated grief at baseline (T1) six months (T2) and twelve months (T3)

| <i>Complicated grief</i> | T1         |              |         | T2         |              |         | T3         |              |         |
|--------------------------|------------|--------------|---------|------------|--------------|---------|------------|--------------|---------|
|                          | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ | $\Delta F$ | $\Delta R^2$ | $\beta$ |
| <i>Step 1</i>            | -          | -            |         | 399.00**   | .70          |         | 272.71**   | .65          |         |
| Baseline symptoms        |            |              | -       |            |              | .80**   |            |              | .83**   |
| <i>Step 2</i>            | 6.03**     | .10          |         | 1.98†      | .01          |         | 3.86**     | .03          |         |
| Time since loss          |            |              | -.13**  |            |              | -.01    |            |              | .13**   |
| Kinship 1                |            |              | .15**   |            |              | .08†    |            |              | .01     |
| Kinship 2                |            |              | .07     |            |              | .06     |            |              | .06     |
| Kinship 3                |            |              | .00     |            |              | -.06    |            |              | -.10*   |
| <i>Step 3</i>            | 114.17**   | .30          |         | 0.00       | .00          |         | 0.00       | .00          |         |
| Neuroticism              |            |              | .23**   |            |              | .02     |            |              | .01     |
| <i>Step 4</i>            | 47.57**    | .18          |         | 3.33*      | .01          |         | 4.80**     | .02          |         |
| RRS Brooding             |            |              | .24**   |            |              | -.17**  |            |              | -.18**  |
| RRS Reflection           |            |              | .05     |            |              | .00     |            |              | -.05    |
| <i>Step 5</i>            | 16.71**    | .12          |         | 3.82**     | .03          |         | 2.15†      | .02          |         |
| UGRS Injustice           |            |              | .27**   |            |              | .21**   |            |              | .14*    |
| UGRS Reactions           |            |              | .00     |            |              | -.16**  |            |              | -.13*   |
| UGRS Counterfactuals     |            |              | .15**   |            |              | .02     |            |              | .02     |
| UGRS Meaning             |            |              | .10*    |            |              | -.08†   |            |              | .03     |
| UGRS Relationships       |            |              | .09*    |            |              | .11*    |            |              | .14*    |

Note. RRS = Ruminative Response Scale. UGRS = Utrecht Grief Rumination Scale. Kinship is dummy coded. Kinship 1 = partner vs. parent, Kinship 2 = child vs. parent, Kinship 3 = sibling vs. parent. \*\* =  $p < .01$ , \* =  $p < .05$ , † =  $p < .10$ .

## APPENDIX CHAPTER 4

### SUPPLEMENTAL ANALYSES

**Table A** Summary of the mediation analysis uncontrolled for symptom levels in which avoidance processes mediate the relationship between grief rumination and symptoms of complicated grief (Model 1) and depression (Model 2).

| Model | Mediator               | Total Effect (c) | Direct Effect (c') | Total indirect effect ( $\Sigma a \times b$ ) | Unique indirect effect (a x b) | 95% CI     |
|-------|------------------------|------------------|--------------------|---|--------------------------------|------------|
| 1     | Experiential avoidance | 1.02*            | 0.54*              | 0.48*   | 0.17*                          | 0.05-0.34  |
|       | Thought suppression    |                  |                    |   | 0.09                           | -0.02-0.21 |
|       | Behavioral avoidance   |                  |                    |   | 0.20*                          | 0.09-0.35  |
|       | Loss-reality avoidance |                  |                    |   | 0.01                           | -0.05-0.09 |
| 2     | Experiential avoidance | 0.18*            | 0.04               | 0.14*   | 0.04*                          | 0.00-0.09  |
|       | Thought suppression    |                  |                    |   | 0.00                           | -0.03-0.02 |
|       | Behavioral avoidance   |                  |                    |   | 0.10*                          | 0.06-0.15  |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | -0.02-0.01 |

Note: \* = significant at  $p < .05$ .

**Table B** Summary of the mediation analyses uncontrolled for symptom levels in which avoidance processes mediate the relationship between trait rumination and symptoms of complicated grief (Model 1) and depression (Model 2).

| Model | Mediator               | Total Effect (c) | Direct Effect (c') | Total indirect effect ( $\Sigma a \times b$ ) | Unique indirect effect (a x b) | 95% CI     |
|-------|------------------------|------------------|--------------------|---|--------------------------------|------------|
| 1     | Experiential avoidance | 0.71*            | 0.13               | 0.58*   | 0.23*                          | 0.10-0.41  |
|       | Thought suppression    |                  |                    |   | 0.14*                          | 0.01-0.29  |
|       | Behavioral avoidance   |                  |                    |   | 0.18*                          | 0.09-0.33  |
|       | Loss-reality avoidance |                  |                    |   | 0.02                           | -0.05-0.10 |
| 2     | Experiential avoidance | 0.15*            | 0.02               | 0.13*   | 0.04*                          | 0.01-0.09  |
|       | Thought suppression    |                  |                    |   | 0.00                           | -0.04-0.03 |
|       | Behavioral avoidance   |                  |                    |   | 0.09*                          | 0.05-0.13  |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | -0.02-0.02 |

Note: \* = significant at  $p < .05$ .

**Table C** Summary of the post-hoc mediation analyses uncontrolled for symptom levels in which avoidance processes mediate the relationship between grief rumination and symptoms of complicated grief (Model 1) and depression (Model 2).

| Model | Mediator               | Total Effect (c) | Direct Effect (c') | Total indirect effect ( $\sum a \times b$ ) | Unique indirect effect (a x b) | 95% CI     |
|-------|------------------------|------------------|--------------------|---|--------------------------------|------------|
| 1     |                        | 1.04*            | 0.61*              | 0.43*                                       |                                | 0.31-0.57  |
|       | Thought suppression    |                  |                    |   | 0.15*                          | 0.06-0.27  |
|       | Behavioral avoidance   |                  |                    |   | 0.27*                          | 0.16-0.43  |
|       | Loss-reality avoidance |                  |                    |   | -0.01                          | -0.08-0.07 |
| 2     |                        | 0.19*            | 0.06*              | 0.13*                                       |                                | 0.08-0.18  |
|       | Thought suppression    |                  |                    |   | 0.01                           | -0.01-0.04 |
|       | Behavioral avoidance   |                  |                    |   | 0.12*                          | 0.08-0.17  |
|       | Loss-reality avoidance |                  |                    |   | -0.01                          | -0.03-0.01 |

Note: \* = significant at  $p < .05$ .

**Table D** Summary of the post-hoc mediation analyses uncontrolled for symptom levels in which avoidance processes mediate the relationship between trait rumination and symptoms of complicated grief (Model 1) and depression (Model 2).

| Model | Mediator               | Total Effect (c) | Direct Effect (c') | Total indirect effect ( $\sum a \times b$ ) | Unique indirect effect (a x b) | 95% CI     |
|-------|------------------------|------------------|--------------------|---|--------------------------------|------------|
| 1     |                        | 0.69*            | 0.23*              | 0.46*                                       |                                | 0.28-0.65  |
|       | Thought suppression    |                  |                    |   | 0.21*                          | 0.10-0.35  |
|       | Behavioral avoidance   |                  |                    |   | 0.25*                          | 0.13-0.41  |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | -0.06-0.07 |
| 2     |                        | 0.14*            | 0.04               | 0.10*                                       |                                | 0.05-0.16  |
|       | Thought suppression    |                  |                    |   | 0.01                           | -0.01-0.04 |
|       | Behavioral avoidance   |                  |                    |   | 0.09*                          | 0.04-0.14  |
|       | Loss-reality avoidance |                  |                    |   | 0.00                           | -0.02-0.01 |

Note: \* = significant at  $p < .05$ .