

UNIVERSITÉ CATHOLIQUE DE LOUVAIN
Faculté de Psychologie et des Sciences de l'Éducation



Persistent and dysfunctional grief reactions:
An investigation of their underlying cognitive processes



Promoteur:
Pr. **Emmanuelle Zech**

Thèse présentée en vue de l'obtention du
grade de Docteur en Sciences Psychologiques
par **Emily Delespaux**

Louvain-la-Neuve, Janvier 2013

Cover illustration : « L'équilibriste », Christiane Erard

UNIVERSITÉ CATHOLIQUE DE LOUVAIN
Faculté de Psychologie et des Sciences de l'Éducation



Persistent and dysfunctional grief reactions:
An investigation of their underlying cognitive processes



Promoteur:

Pr. **Emmanuelle Zech**

Thèse présentée en vue de l'obtention du
grade de Docteur en Sciences Psychologiques
par **Emily Delespaux**

Table of contents

Remerciements.....	15
Chapitre 1- General Introduction	19
1. Introduction.....	21
2. Grief and prolonged grief disorder (PGD).....	26
3. Models of adjustment: From the grief work hypothesis to the regulatory process of flexible confrontation and avoidance alternation	28
3.1. Conclusion.....	34
4. When the grieving process is maladaptive.....	34
4.1. Deficits in flexible oscillation between LO and RO: primarily LO, primarily RO or staccato fluctuations between LO and RO.....	35
4.2. Too much focus on negative affect: the specific case of prolonged rumination.....	36
4.3. DPM propositions: Empirical evidence	36
4.4. Conclusion.....	37
5. Insecure attachment: a risk factor for the development of maladaptive grieving process	37
5.1. Attachment insecurities and disordered patterns of grief.....	40
5.2. Attachment and (mal)adaptive grief processes: Empirical evidence	41
5.3. Conclusion.....	42
6. Rumination.....	42
6.1. Conclusion.....	48
7. Cognitive inhibition	48
7.1. Deficits in cognitive inhibition and their consequences in information processing	49
7.2. Conclusion.....	50
8. The present thesis.....	51
8.1. Attachment and severity of grief: The mediating role of negative appraisal and inflexible coping (Study 1)	51
8.2. Why Do Bereaved Partners Experience Interfering Rumination? Evidence for Deficits in Cognitive Inhibition (Study 2 & 3)	52
9. Conclusion	53
10. References.....	54

Chapter 2 - Attachment and severity of grief: The mediating role of negative appraisal and inflexible coping65

1.	Introduction.....	69
2.	The present study	71
3.	Method	73
3.1.	Participants	73
3.2.	Procedure.....	74
3.3.	Measures.....	74
3.4.	Data reduction and normality assumption.....	78
4.	Results.....	78
4.1.	Correlations	78
4.2.	Mediational analyses	80
5.	Discussion	83
6.	References.....	89

Chapter 3 - Why do bereaved partners experience interfering rumination? Evidence for deficits in cognitive inhibition93

1.	Introduction.....	97
2.	Method	100
2.1.	Participants	100
2.2.	Instruments and materials.....	102
2.3.	Procedure.....	103
2.4.	Design.....	105
2.5.	Data reduction	106
2.6.	ANOVA's assumptions.....	107
3.	Results.....	107
4.	Discussion	112
5.	References.....	118

Chapter 4 - Bereavement-related rumination and deficits in cognitive inhibition: Evidence from a thought suppression task..... 123

1.	Introduction.....	127
2.	Method	131
2.1.	Participants	131
2.2.	Materials.....	133
2.3.	Procedure.....	135
2.4.	Design.....	136

3.	Results.....	137
3.1.	Rumination and severity of grief reactions	137
3.2.	Subjective suppression rating during the suppression period	137
3.3.	Stroop reactions times (RTs) during the rebound period	137
4.	Discussion	140
5.	References.....	147
Chapter 5 – General discussion.....		153
1.	Summary of the studies and their related results	155
1.1.	Why do grief reactions persist? The meditational influence of negative appraisals and inflexible coping on the relation between attachment insecurities and severe grief.....	155
1.2.	Why do bereaved individuals experience prolonged rumination? An investigation of its underlying processes.....	157
1.3.	Evidence for deficits in access limitation and suppression	161
2.	Do the RRS and the RIQ assess comparable cognitive processes?	162
3.	When the measured processes of the RRS and the RIQ have to be distinguished: A refined interpretation of studies 2 and 3 results.....	164
4.	Do the different types of repetitive thought coexist as underlying processes of grief complications?	166
5.	A self-defeating cycle of different type of maladaptive repetitive thought: a refinement of Maccallum and Bryant (2010) formulations	167
5.1.	Direction for future research	172
6.	When rumination (RRS and RIQ) and ITG reactions were both shown to explain the observed cognitive deficits: Further considerations.....	173
7.	What about the mediational process of the link between anxious attachment and debilitating grief reactions? Further propositions of investigation	174
8.	General limitations.....	175
9.	Final conclusion	176
10.	References.....	178
Appendix		183
1.	Questionnaire d'attachement.....	185
2.	Questionnaire d' « appraisal » des stressseurs du deuil	187
3.	Questionnaire de coping de deuil (oscillation)	191

4.	Inventaire du deuil traumatique	195
5.	Questionnaire de rumination mentale	200
6.	Questionnaire d' « intrusions »	202
7.	Matrice des listes des mots deuil, négatifs, positifs, et neutres pour la tâche Stroop	203
8.	Matrice des listes de mots pour le NAP et création des listes prédéfinies de mots deuils et positifs.....	204
9.	Liste prédéfinie des mots « deuils » et positifs pour la tâche NAP	209
10.	Liste prédéfinie des mots négatifs et positifs pour la tâche NAP	210
11.	Literature review of the rumination concept.....	211

Remerciements

Bien que la thèse représente un long cheminement intérieur et parfois très solitaire, sa réalisation n'en est pas moins tributaire des interactions sociales - tant professionnelles que personnelles - qui sont vécues durant l'ensemble du processus.

Ainsi, je tiens à remercier très chaleureusement ma promotrice, Emmanuelle Zech. C'est grâce à une supervision soutenue et positive que ce travail a pu réellement aboutir. Manu, très sincèrement merci pour toute l'attention, la considération (inconditionnelle et positive), l'empathie et les renforcements dont tu as fait preuve à mon égard durant ces quatre années de thèse. Tout en me laissant une grande liberté d'action et de réflexion, tu m'as accompagnée à chacune des étapes avec une patience et une souplesse incroyable. Grâce à tes conseils tout en douceur et tes feed backs réguliers, j'ai abondamment appris et progressé. J'en ressors maintenant plus forte et plus outillée que je ne l'ai jamais été. Merci Manu, merci beaucoup.

Je souhaite également remercier chacun des membres de mon comité d'accompagnement de thèse grâce auxquels mon travail a pu se construire et s'élaborer. Tout d'abord, Bernard Rimé, qui me supervise depuis le mémoire, a été une figure particulièrement importante du début à la fin. Toujours présent, rassurant, et renforçant, Bernard Rimé a été l'une des personnes qui aura le plus cru en mon travail et qui aura permis que je puisse y croire moi-même. Bernard, je souhaite donc vous remercier très particulièrement pour le soutien mais aussi pour la confiance invariable que vous m'avez toujours accordée. Je tiens également à noter que c'est grâce à vous que j'ai découvert les délicieuses recherches de Jutta Joormann, lesquelles m'ont inspirée ces trois dernières années. Merci à vous ! Viennent ensuite Margaret Stroebe et Philippe de Timary. Maggie, vous avez porté une attention toute particulière à mon travail, à travers des relectures fines et des conseils avisés. Ce fut un honneur mais aussi un vrai régal d'avoir pu recevoir un feed back de l'auteure d'un des modèles majeurs de ma thèse. Merci beaucoup. Phillipe, vous m'avez offert à de nombreuses reprises de nouveaux points de vue sur mon travail. Ces recadrages ont été très utiles dans l'élaboration de la thèse. Merci à vous pour vos réflexions et suggestions judicieuses.

Je souhaite également remercier les personnes qui ont directement collaboré au travail de recherche proprement dit. Parmi elles, je pense à Emilie Vaessen, Bénédicte Peeters, Fanny Lantrebecq, Céline Van der Beken et Nancy Deissis, autant de mémorantes compétentes et motivées avec qui j'ai récolté des données. Je pense également à Marie Vander Haegen, une brillante stagiaire avec qui il fut très agréable d'échanger, tant sur le plan méthodologique que théorico-conceptuel. Anne-Sophie Ryckebosch-Dayez, Alexandre Heeren, mes collaborateurs directs, ont également contribué de manière significative au démarrage mais aussi à la finalisation du travail de thèse.

Par ailleurs, je souhaite remercier mes collègues, pour leurs conseils et leur soutien. En particulier Nicolas Vermeulen (pour ses discussions très intéressantes,

entre deux portes), Pierre Mahau (pour son soutien informatiques et électromécanique), Moira Mikolajczak (pour m'avoir soutenue quand le moral fut plutôt bas), François Moors (pour ses petites aides au quotidien), Ilios Kotsou (pour m'avoir appris à relativiser), Jean-Baptiste Dayez (pour son soutien informatique), Nadine Didier (pour ses « bonjours » enjoués tous les matins), Nadine Fraselle (pour son soutien à la recherche extra/post-Académique), Pierre Philippot (pour ses divers feed backs), et beaucoup d'autres encore. Chacun à leur manière, ils ont contribué à la réalisation et à l'accomplissement de ce lourd travail qu'est la thèse. Grâce à eux, la tâche fut plus légère. Merci très sincèrement !

Un tout grand merci à Johanan Tang, Charles Stone et à ma sœur, Anne-Sophie Delespaux, pour leurs patientes relectures de l'anglais

Pour terminer, je tiens tout particulièrement à remercier mes amis et ma famille, pour m'avoir supportée (dans les deux sens du terme !) tout au long de ces années. Un tout grand merci à Nicolas Pinon (pour nos nombreuses conversations, toutes aussi profondes et décapantes que fortifiantes - de véritables bouteilles d'oxygène !), Géraldine Monnoyer (pour tes innombrables sourires et nos joyeux moments passés ensemble), Yannick Taymans (pour ton amitié fidèle et inconditionnelle), Noémie Mayer (pour m'avoir interdit de laisser tomber quand je perdais espoir), Alexandre Heeren (pour nos croisements dans les couloirs, qui finissent en discussions « à tout-va »,), Elise Brassart (pour nos moments de vie conviviaux et nos fous rires), et beaucoup d'autres encore. Enfin, je souhaite remercier tout spécialement ma mère, qui depuis toujours n'a jamais cessé de veiller sur moi. Merci à toi, Jack', pour tes milles attentions, pour ton écoute, ta patience et ta disponibilité sans faille. Je ne serais jamais arrivée jusqu'ici sans toi. Merci pour tout.

Emily Delespaux, le 17 janvier 2013

Chapitre 1- General Introduction

1. Introduction

After the loss of a loved one, most people experience acute grief reactions (e.g., shock, distress, yearning, disbelief, loneliness, anger, numbness), which naturally attenuate over a period of time (Bonanno et al., 2002). The intensity of acute grief and the periods of time over which it ensues are variable, depending on several factors (e.g., the degree of anticipation of the death, circumstances of death, intrapersonal and interpersonal variables, ways of coping, etc.) (M. K. Shear et al., 2011; M. S. Stroebe, Schut, & Stroebe, 2007). Yet, studies show that for most people, grief intensity is fairly lessened after a period of 6 months. This does not suggest that grief is completely dealt with or resolved, but rather that it has become further integrated, and no longer stands in the way of ongoing life (M. K. Shear et al., 2011).

While most of the bereaved finally adapt to the loss, an accumulating body of research demonstrates that a subset of bereaved individuals (10%) experiences enduring psychological distress (Bonanno & Mancini, 2008; Prigerson et al., 2009). Among the most frequent psychological symptoms observed are persistent, disabling and distressing symptoms of grief, major depressive disorder (MDD), anxiety disorder (Field, Gao, & Paderna), and post-traumatic stress disorder (PTSD) (Boelen, van de Schoot, van den Hout, de Keijser, & van den Bout, 2010; M. S. Stroebe et al., 2007).

Since the mid-1990s, clinicians and researchers have suggested that prolonged grief specific symptoms per se constitute a clinically disabling syndrome portraying distinctive phenomenology from major depressive and anxiety disorders (Boelen & Prigerson, 2013; Prigerson et al., 1995; Prigerson et al., 2009; M. K. Shear et al., 2011). More importantly, these clinicians and researchers have increasingly pled for the inclusion of such a grief syndrome as a new diagnostic category in the DSM system (for a review, see Boelen & Prigerson, 2013). Initially referred to as “pathological grief” (M. J. Horowitz, Bonanno, & Holen, 1993), “complicated grief disorder” (M. J. Horowitz et al., 1997) or even “traumatic grief” (Prigerson & Jacobs, 2001), the specific syndrome of grief is currently labeled “prolonged grief disorder” (PGD) (Boelen & Prigerson, 2013), as it is now termed henceforth abbreviated as PGD.

Several studies have supported the psychometric validity of specific PGD criteria (Boelen & van den Bout, 2008; Prigerson et al., 2009; M. K. Shear et al., 2011) and recent investigations have demonstrated the incremental validity of the condition (Bonanno et al.,

2007). Nowadays, three criteria sets are proposed for inclusion in the DSM-5 and the ICD-11 (Boelen & Prigerson, 2013): criteria for Prolonged Grief Disorder put forth by Prigerson et al. (2009), criteria for Complicated Grief from M. K. Shear et al. (2011), and criteria for Adjustment Disorder (Field et al.) Related to Bereavement and Bereavement Related Disorder recently proposed by the DSM-5 Anxiety Disorder Working Group (APA, 2012) (for a complete description, see Boelen & Prigerson, 2013). Because the set of criteria proposed by Prigerson et al. (2009) is the one which has been the most empirically assessed (in comparison with the two others), as well as validated, we opted to focus on this specific line of work in the present thesis.

After establishing a first condition of having experienced the death of a significant other (Criteria A), proposed criteria for PGD (Prigerson's perspective) include two basic symptoms cluster criterion. These basic clusters include separation distress symptoms (Criterion B) - the experience of yearning (e.g., physical or emotional suffering as a result of the desired, but unfulfilled, reunion with the deceased) - and cognitive, emotional and behavioral symptoms (Criterion C) - feeling emotionally numb, stunned or the belief that life is meaningless, experiencing mistrust, bitterness over the loss, difficulty accepting the loss, identity confusion, avoidance of the reality of the loss, or difficulty moving on with life. That being said, these symptoms must be present at sufficiently high levels at least 6 months after the death and be associated with functional impairment (Prigerson et al., 2009).

The addition of the 6 months grief duration criteria corresponds to the fact that in PGD, this is acute typical grief symptoms that are inordinately sustained. Such length for a clinically significant distress or disability leads in turn to the following functional impairment criteria (e.g., impairment in work and social functioning, sleep disturbance, disruption in daily activities, impairment in relationship functioning) (for a review, see M. K. Shear et al., 2011). Moreover, it is worth underlining that prolonged symptoms of grief are also likely to affect the course of other disorders (M. K. Shear et al., 2011). For example, among bereaved individuals with bipolar disorder, the occurrence of prolonged symptoms of grief is related to increased panic disorder, greater suicidality, and higher sleep disturbance (M. K. Shear et al., 2011). Finally, compared to normal grief, elevated levels of grief symptomatology pose significant risks for mental and physical morbidity and adverse health behaviors (e.g., increased use of tobacco and alcohol, suicidality) (Prigerson & Jacobs, 2001).

Given the debilitating nature of enduring grief reactions, it seems important to provide adapted guidelines for successful psychotherapeutic interventions. In a recent publication, it has first been suggested that, to be effective, interventions need to target bereaved individuals who are in need of mediation (Zech, Ryckebosch-Dayez, & Delespaulx, 2010). Accordingly, effective interventions require identifying the persons who are at risk of developing severe grief reactions. Numerous studies have investigated the multiple risk factors of grief complications (e.g., M.S. Stroebe, Folkman, Hansson, & Schut, 2006; van der Houwen, Stroebe, Stroebe, et al., 2010). What we mean by risk factors, are namely the “distal” factors that solely cause psychopathology via mediating more proximal risk factors (Nolen-Hoeksema & Watkins, 2011). Among the most important risk factors associated with grief complications are included being of the female gender, a history of childhood separation anxiety, controlling parents, parental abuse or death, a history of mood disorder, insecure attachment styles, an intimate relationship with the deceased, marital supportiveness and dependency, traumatic loss (unexpected or uncontrollable) and secondary losses, pessimistic temperament and personality, low social support or negative reactions of social environment, etc. (for a review, see Prigerson et al., 2009; M. K. Shear et al., 2011). According to their relative influence on adjustment to grief, these factors should thus be kept in mind, as well as taken into consideration when encountering bereaved individuals.

In addition, it has also been argued that, to be effective, interventions for bereaved individuals who suffer from complications should specifically address the processes that underlie the development and the maintenance of the grief-related pathology (Zech et al., 2010). What we mean by processes are the variables that mediate the relationship between the more distal risk factors highlighted above and prospective psychopathology (Nolen-Hoeksema & Watkins, 2011). Yet, in contrast with distal risk factors, processes tend to be more controllable and modifiable (Nolen-Hoeksema & Watkins, 2011). Because they are modifiable, such processes are thought to be perfect targets for therapeutic intervention.

To date, numerous theoretical frameworks have provided fecund propositions with regard to the processes that could directly underlie grief complications (for a review, see R. O. Hansson & M. S. Stroebe, 2007). Among the most prominent propositions, are included the grief work model (Bowlby, 1980; Freud, 1917/1957; C. M. Parkes, 1972/1996; Worden, 1982/1991/2002/2009), the stress response syndrome model (M.J. Horowitz, 1986), the four-component model (Bonanno & Kaltman, 1999), the notion of emotion regulation, disclosure, and sharing (Pennebaker, Zech, & Rimé, 2001), the notion of

meaning making (Neimeyer, 2001), the notion of positive reappraisal (Folkman, 2001), the notion of rumination (Nolen-Hoeksema, 2001), the cognitive-behavioral conceptualization of complicated grief (P.A. Boelen, M.A. van den Hout, & J. van den Bout, 2006) and finally, the dual-process model of coping with bereavement (DPM; M.S. Stroebe & Schut, 1999, 2010).

One important observation which can transversely be made on these models is that most of the recommended processes for adaptive grief adjustment could be conceptualized as – more or less directly – associated with the cognitive restructuring of preexistent autobiographical structure/knowledge, which could itself be assimilated to the core business of grief (see below for in-depth descriptions). The same can also be observed, for the recognized processes of grief maladjustment, which could be conceptualized to prevent – more or less directly – the cognitive integration of the loss in preexistent, yet outmoded, schemes of representations (see below for in-depth descriptions). Accordingly, the central process of grief (mal)adjustment might be suggested to be of a cognitive kind. In the present thesis, what we call “cognitive processes” is the processes included in the information processing (Plagnol, 2003).

Among the previously cited grief models, some of them obviously mention maladaptive processes of adjustment that specifically appear of a cognitive kind. For example, Freud (1917/1957), suggested that suppression (i.e., cognitive avoidance), in contrast with the adaptive cognitive process of confronting the loss (i.e., grief work), should be detrimental. M. J. Horowitz et al. (1993) later argued that difficulties in the cognitive control of emotional thoughts (i.e., excessive self-focused attention and anxiety-related vigilance), as well as the subsequent inhibition (i.e., cognitive avoidance) of further negative information processing, should lead to pathology. Finally, M.S. Stroebe and Schut (1999; 2010) have introduced the notion of a flexible oscillation which implies shifting attention from loss- to restoration-oriented stressors and conversely. More recently, they also have specified cognitive pathways (oscillation between negative and positive meanings, reappraisals and attributions) into their model (i.e., DPM).

While such cognitive processes have been recently empirically considered and relatively validated (e.g., Caserta & Lund, 2007; Richardson & Balaswamy, 2001; M.S. Stroebe & Schut, 2008) further validation of these is still needed. Given their importance for therapeutic considerations (Zech et al., 2010), the aim of the present thesis is to precisely investigate the specific cognitive processes that presumably underlie grief complications. Acknowledging that several background variables (more distal risk factors)

may have an influence on the bereavement outcomes, the present thesis has focused specifically on the precise (mal)adaptive cognitive processes (i.e., mediators) that might explain such an influence. Adequate enlightenment about these cognitive processes should in turn help provide adapted guides for efficient clinical interventions.

In the following sections, we intend to further explain the variables that will be addressed in the present thesis. First, we will clarify the notion of grief and grief complications. As the concept is still not a consensus, we had thus to choose one set of criteria among others to conduct our thesis. The chosen set of criteria, as well as its assessment tool will be described.

Then we will present three theoretical models which best describe the adaptive cognitive processes that take place after the loss. The aforementioned models will be presented successively, from the less comprehensive to the more integrated. On the basis of the latter model, we will then introduce the maladaptive processes (i.e., the present mediational variables) suggested to underlie PGD symptomatology.

Once this is covered, we will present the major guidelines of attachment theory, one of the leading frameworks to understanding individual differences in emotion regulation and adjustment processes (including cognitive processes), specifically following stressful events such as the loss of a significant other. Introduced as stable emotion regulatory device, we will present (insecure) attachment styles (risk factors) and their instrument of evaluation. We will then display a summary of the theoretical assumptions which have suggested a linkage between (insecure) attachment styles and differential mechanisms or processes of how to come to terms with the loss of a significant person (i.e., mediational processes) but also differential (disordered) patterns of grief. We will then briefly depict the empirical related literature.

Following the above we will present the rumination process, namely a process of negative repetitive thought. For over two decades, researchers have indeed increasingly shown this process as to be a significant mediator of grief complications. Widely theoretically and empirically investigated in the bereavement literature, we will however decry the concept of rumination to be very confusing. In order to clarify the concept, we will suggest making a theoretical distinction between rumination as an underlying process of PGD and rumination as a specific grief symptom or even rumination as an adaptive grief process. In addition, as an underlying process of PGD, we will review the various definitions and ways of assessment of rumination, which will finally lead us to separate the concept into two different entities: mental and rumination intrusions. The newly

recommended entities will be defined and their related maladaptive mechanisms of action, as well as underlying processes, will be specified.

The concept of cognitive inhibition will subsequently be displayed as it can be observed, when malfunctioning, in straight line with grief processing deficiencies but also specially associated with rumination development and maintenance. In this section, we will briefly present the main theoretical models of cognitive inhibition and the first empirical validation of these.

Last but not least, the three empirical studies specifically conducted to address the former maladaptive processes will be briefly introduced.

2. Grief and prolonged grief disorder (PGD)

Different lines of research are still working on the specification of grief symptomatology criteria with regard to its future inclusion in the DSM-5 and the ICD-11 (Prigerson et al., 2009) (Shear et al., 2011) (APA, 2012) (for a review, see Boelen & Prigerson, 2012). In the present thesis, we decide to focus on Prigerson and her colleagues' work which has provided most of the existing data supporting PGD as a new distinct and disabling condition (started two decades ago and still continuing to grow). Based on several empirical validation studies, successive criteria sets have been projected. The most recent is Prigerson et al. (2009). However, in the present thesis (launched in 2008), we have focused on the work of Prigerson and Jacobs (2001), so long as no consensus has been reached. Therefore, coherence with regards to grief symptomatology was preserved throughout our successive studies.

Within the Prigerson and Jacobs (2001) framework, it was first argued that a wide range of “symptoms” that occur after the loss could be considered within normal limits. However, at elevated levels, grief symptomatology was thought to pose significant risks of clinical morbidity. To define the boundary between normal and pathological, Prigerson and Jacobs (2001) have tested and further refined a criteria set previously specified throughout discussions with a large panel of leading experts (Prigerson et al., 1999). Results of their study revealed that specific marked symptoms of grief, persisting for more than 2 months, was critical factors for distinguishing between normal and pathological grief.

The refined criteria set can be described as follows. After establishing a first condition of having experienced the death of a significant other (Criteria A1), two basic symptoms cluster criterion have been specified. These basic clusters include symptoms of separation

distress (Criterion A2) and symptoms of traumatic distress (Criterion B). The separation distress symptoms cluster includes intrusive, distressing thoughts about the deceased (e.g., yearning, longing, or searching) and loneliness as a result of the death. These symptoms are defined as the core of the grief-related disorder. The traumatic distress symptoms cluster includes purposelessness or feelings of futility about the future; subjective sense of numbness, detachment, or absence of emotional responsiveness; difficulty acknowledging the death (e.g., disbelief); feeling that life is empty or meaningless; feeling that part of oneself has died; shattered world view (e.g., lost sense of security, trust, control); assumed symptoms or harmful behavior of, or related to, the deceased person; excessive irritability, bitterness, or anger related to the death. Added up, these symptoms intend to reflect the specific ways in which individuals are traumatized or devastated by their loss.

Following Prigerson and Jacob' (2001) analyses, the determination of syndromal level of grief involves a combination of 3 of the 4 symptoms of the Criterion A2 and 4 of the 8 symptoms of the Criterion B, being experienced as at least “mostly true”. In addition, duration of disturbance (symptoms) should at least last two months (Criterion C) and the disturbance has to cause “severe” impairment in social, occupational, or other important functional areas (Criterion D).

Founded on the work on diagnostic criteria described earlier, Prigerson and Jacobs (2001) have developed a 30-item self-report symptom severity questionnaire, the Inventory of Traumatic Grief (ITG) (see Appendix 4). Levels of symptom severity during the last month are evaluated with five-point Likert scales ranging from 1 (*never*) to 5 (*always*). Besides providing an assessment tool to assist in determining whether or not the responses would meet the threshold required for a diagnostic of PGD (normal vs. PGD), the questionnaire also provides a continuous measure of symptom severity (by summing the items). Both utilizations have been carried out in the bereavement field. However, it is the continuous score that has been used in the present thesis. The present given point of view was, indeed, less focused on the processes that underlie “standard” pathology rather than those that underlie the maintenance of symptoms which the bereaved him- or herself finds problematic and difficult to get rid of. (Zech et al., 2010). Accordingly, we have focused on grief severity, whether clinical standards were reached or not. Regardless, most of the participants having taken part in our present studies showed subclinical levels of grief severity. Consequently, using a diagnostic of PGD (a categorical measure) would have been inadequate for statistical analysis.

Now that the concept of PGD and its way of measurement in the present thesis has been clarified, the next section will focus on three major models of grief adjustment. These models specify the “normal” processes that take place after the loss of a loved person and which favor grief adjustment. Specifically, we will see how the first “grief work” model of Freud (1917/1957) which was primarily defined by confrontational processes, has been progressively extended by M. J. Horowitz et al. (1993) with the inclusion of the notion of avoidance as a regulatory process, and finally completed by M.S. Stroebe and Schut (1999) with the integration of both processes (confrontation and avoidance) into a complex process of oscillation between specific grief-related demands.

3. Models of adjustment: From the grief work hypothesis to the regulatory process of flexible confrontation and avoidance alternation

Dealing with an event such as the loss of a significant person requires an active, ongoing, effortful attempt to come to terms with that particular loss (M. S. Stroebe, 1992). One has to realize that the loved one no longer exists and he or she has to adapt to a world that will never be the same as the one in which the loved one lived in. This laborious process of adjustment has been commonly called “grief work”. Firstly introduced by Freud (1917/1957) and later on widely used by the most influential theorists on the subject (Bowlby, 1980; Worden, 1982/1991/2002/2009), grief work has been depicted in diverse ways.

Specifically, Freud (1917/1957 p. 253) described the “*the work which mourning performs*” as a process of “reality testing” through which the bereaved individuals come to realize that the loved one no longer exists. According to this notion, Freud maintained that each and every memory linking the bereaved person to the deceased needs to be brought in mind. With time, these links would thereby be broken. In brief, “basic to its formulation, is the notion that one needs to confront, to work through, grief in order to gain detachment and reestablish ties with others” (M. S. Stroebe, 1992, p. 21). In the same way, Lindemann (1944) argued that resolution of grief implies repeated dwelling on the deceased and the lost relationship. This repeated dwelling can be identified as a process of desensitization through repeated, though not continuous, exposure to the painful fact of loss. Also, in the same way, Bowlby (1980) argued for the working through hypothesis, by referring to the cognitive act of redefining self and situation, and the process of realization and reshaping

internal representational models to align them with changes that have occurred. Finally, C. M. Parkes (1972/1996) went further than previous formulations of grief work and proposed various components that make up the process. First, there is preoccupation with thoughts of the lost person. Second, there is painful repetitious recollection of the loss experience which is essential if loss has not been accepted as irrevocable. Third, there is an attempt to make sense of the loss. Either, it has to be fitted into present assumptions about the world, or these assumptions need to be modified.

To sum up, grief work can be described as “a cognitive process of confrontation with the reality of loss, through which bereaved people adapt to the death of a loved person. Such confrontation involves recollection of thoughts about the deceased and the death experience. These may occur repetitively and continue over weeks or even months following a death, the bereaved being preoccupied during this time with their bereavement. It entails a gradual reconstructing or reframing of thoughts and feelings about the loss. {...}grief work is a process which leads to assimilation of changes, or accommodation of assumptions that the loss necessitates” (M. S. Stroebe, 1992, p. 33).

Though widely used during the latter part of the 20th century, the fundamental notion of grief work suffers from some limitations (for a complete description, see M.S. Stroebe & Schut, 2010). Among these, central to this conception, is the view that one has to bring the reality of the loss into one’s consciousness as often as possible and that denial or avoidance is a pathological phenomenon (M. S. Stroebe, 1992). Yet, since two decades, numerous arguments have been brought forward in striking contrast with this assertion. They are presented below.

First, several researchers have progressively disconfirmed the idea of avoidance as a pathological process (e.g., Bonanno, Keltner, Holen, & Horowitz, 1995; M.S. Stroebe & Schut, 1999; Tait & Silver, 1989). In striking contrast, it has been argued that “within the range of grief processes, it is possible that suppression and avoidance of confrontation with memories related to the deceased can be as effective a strategy as “working through” grief” (M. S. Stroebe, 1992). According to this view, in some situations, working through grief may be neither necessary nor better than non-confrontational or even avoidance strategies.

In the same line of reasoning, stress researchers have argued that denial is effective in coping at times when experiencing the reality of the loss becomes too anxiety provoking. M. J. Horowitz et al. (1993) for example, argues that when extreme emotions are experienced, the denial, numbing, and avoidance phases are in part an effort to ward off/regulate/modulate these strong feelings. According to this line of research, denial

might thus be a good way in which bereaved person regulate or “dose” the amount of emotional pain that they can bear (S. R. Shuchter & S. Zisook, 1993).

Finally, Kavanagh (1990) argued for controlled distraction techniques (i.e., pleasant distractive activities), a specific form of avoidance, as a powerful method to improve depressive moods in general. Nolen-Hoeksema (2001) similarly suggested that using positive distracters can help dysphoric people getting temporary relief from their mood, as well as going on to think more constructively and problem solving more effectively. As a result, from these lines of research, it would stand to reason that a distracting rather than focusing strategy would at times provide the bereaved with short-term relief and help toward long-term adjustment (M.S. Stroebe & Schut, 2010; M. S. Stroebe, 1992).

In conclusion, despite the useful theoretical framework that the central concept of grief work has evidently offered, the grief work model appears too limited in order to understand how people go about coming to terms with bereavement. One subsequent model that has taken avoidance into consideration is the model of M. J. Horowitz et al. (1993). Much more than a suggestion, M. J. Horowitz et al. (1993) have, in fact straightforwardly integrated avoidance in their modelization of the mourning process. Moreover, this model broadly describes the cognitive processes that take place during the grieving process. This will be developed below.

According to M. J. Horowitz et al. (1993) model, individuals rely on schemas that generalize, organize, and retain a great deal of information about the relative roles and attributes of the self and others, and plans for how interactions might occur in sequences. These schemas serve as condensed knowledge structure to maintain a sense of the world as safe and predictable.

In case of bereavement, schematic structures related to meanings associated with the relationship between the self and the lost other, object and function in life are reactivated. This reactivation is due to the difference between internalized knowledge structure and external reality, or in other words, the mismatches between existing yet now outmoded schemas and the actual perceptions found in real contexts. Alarm emotions/pang of powerful and negative emotions may occur when enduring and expected schemas (enduring mutual relationship) no longer concord with new realities (the news of the death).

When the discrepancies between the current working model, as derived from the news of the death, and the, as yet unchanged, enduring schema of the relationship is recognized, a process of reschematization has to be completed. Mourning can then be defined as an

evolutionary success story: it takes such schemas of the relationship with the deceased and modifies or reschematizes them so one can go on living with enjoyment and meaning in spite of the loss. Attachment bonds are not “forgotten”, the relationship lives on in the mind, but usual procedures of living are modified to concur with new realities and even new opportunities through the process of reschematization.

Specifically, a reschematization process implies dealing with intrusive phases of grief. Intrusive phases of grief can be defined as intrusive experiences including unbidden thoughts of the event and recollections of negative relationship experiences with the deceased. During these intrusion phases, the meaning of the loss to both the self and the other loved ones are internally and mentally assessed. Outcries of fear, helplessness, excitement and despair may result from the suddenly recognized and negatively assessed discrepancies between previous schemas and the reality of the loss.

When experienced emotions become excessive and intolerable, the denial, numbing, and avoidance phases are in part an effort to ward off/regulate/modulate these strong feelings. Denial phases can be defined as avoidance of reminders of the loss, social withdrawal, focusing elsewhere, emotional numbing, non-assessing the implication towards oneself or certain themes.

Accordingly, the mourning process is characterized by controlled/regulated/dosed conscious experience into states in which there is a combination of either intrusive ideas or feelings or omissions of expected ideas and feelings.

The effective fluctuation between intrusion and avoidance depends on regulating attentional, as well as control processes. If the focus of attention on the new reality and its implications inwardly intensifies negative affective states, leading to increased activation of relevant information derived from the related schemas, it has to be actively redirected. Therefore, optimal control has to be attained to allow more “dosing”/manageable levels of recollections. When control processes efficiently regulate the experienced emotion, the death can be processed: the reality of the loss situation is reassessed and schemas are revised (i.e., reschematization).

Then, after a time, repetitions of the other’s sense of loss forges a schematization of the self, one longing for and needing but not finding the other. Gradually, upon reminders of the loss, this tendency to enter states of agitated sadness becomes a tendency to go through states of poignant sadness and resignation. This shift in the emotional intensity of alarm reactions serves as indication that the mourning is in progress. While the M. J. Horowitz et al. (1993)’s model proposes very interesting analysis of grief response

processes, it is based on a more general model of trauma (M.J. Horowitz, 1986). Its main purpose was to determine how much impact the traumatic event had, intrusion-avoidance being a symptomatic process for classification of pathology (R. O. Hansson & M. S. Stroebe, 2007). By contrast, in this section, we are presently focusing on whether intrusion-avoidance coping strategies might lead to adjustment to the event. Consequently, we will address a second stimulating model, the Dual Process Model of Coping with Bereavement (DPM; M.S. Stroebe & Schut, 1999, 2010). This model adequately addresses the core limitation of the grief work model by including avoidance as an integral part of the adjustment process, but also primarily focuses on adaptive principles of coping with bereavement. Based on previous theoretical models of adaptation to grief (e.g., Bowlby, 1980; Freud, 1917/1957; C. M. Parkes, 1972/1996), as well as on empirical evidence having confirmed the need to take into account the benefits of denial (e.g., Bonanno et al., 1995) the DPM can be understood as a taxonomy to describe ways in which people come to terms with the loss of a significant person (M.S. Stroebe & Schut, 2010). Its related components, primarily based on the Cognitive Stress Theory (Folkman, 2001; Lazarus & Folkman, 1984), include two categories of stressors (the nature of the events leading to stress), appraisal processes (ways these events are assessed), coping processes (ways of dealing with aversive events) and outcomes variables (e.g., mental and physical health indices). These components are described below.

Specific to the DPM, is the distinction of two main categories of bereavement-related stressors among the variety of changes or psychosocial transitions associated with bereavement: the loss-oriented stressors and the restoration-oriented stressors. Loss-oriented stressors involve coping strategies such as “concentration on, dealing with, and processing some aspect of the loss experience itself. The grief work concept {...} falls within this dimension, because focus is on the relationship and bond to the deceased, and because it typically includes yearning and rumination about the deceased, dwelling on life together before loss, and going over the circumstances and events leading up to and surrounding the death. Loss orientation (coping strategies) encompasses going over one’s memories of the deceased and the implication of the death: looking at old photos, imagining how he or she would react, and crying about the irrevocable separation. Myriad emotional reactions are involved, from painful longing for the deceased to pleasurable reminders, and from relief that the deceased is suffering no more to despair that one is left all alone” (R. O. Hansson & M. S. Stroebe, 2007, p. 46). Restoration-oriented stressors refer to the stressors that occur as a consequence of a death, reflecting a struggle to

reorient oneself in a changed world without the deceased. Restoration-oriented stressors involve coping strategies such as rethinking and re-planning one's life (e.g., attending to life changes, developing new roles, identities and relationships, doing new leisure activities, etc.) (R. O. Hansson & M. S. Stroebe, 2007). Each of these types of stressors is encountered to varying degrees and each requires coping effort such as those previously described.

Particularly relevant with regard to the described limitation of the grief work hypothesis, the DPM conceptualizes coping with bereavement as a complex regulatory process of confrontation and avoidance. To be more precise, the model postulates a dynamic emotion-regulation process called oscillation that is flexible alternation between the process of attention to and avoidance of the stressors associated with bereavement. R. O. Hansson and M. S. Stroebe (2007, p. 49) described this regulatory mechanism as follows: "At times a bereaved person will be confronted by his or her loss, at other times he or she will avoid memories, be distracted, or seek relief by doing other things. Sometimes, too, it is simply necessary to put grief aside for a while and attend to other stressors associated with bereavement, such as trying to master the changes in income and taxes following the death". As a result, oscillation can be associated with a dynamic and fluctuating process of attention to and avoidance of bereavement-related stressors with flexible alternation between loss-oriented and restoration-oriented coping and between coping and not coping (e.g., in routine, unchanged, everyday life things).

Drawing on earlier cognitive stress research, the DMP also offers to systematize the underlying cognitive mechanisms that could be associated with the coping process. A preliminary study point was offered by Folkman (2001)'s revised coping model, which incorporates the adaptive role of positive affect and appraisal in the coping process and by Nolen-Hoeksema (2001)'s model which focuses on the maladaptive function of persistent negative affect, enhancing grief, yet working through grief, including rumination. Accordingly, the DPM has introduced both Folkman (2001)'s work on positive meaning states and Nolen-Hoeksema (2001)'s on negative appraisals to introduce cognitive pathways into the model. The integration of these two types of cognitive mechanisms in the coping process has finally led to postulate oscillation between positive and negative affect (re)appraisal and cognitive states.

Finally, the DPM suggests variations across the duration of bereavement. "There will gradually (and unevenly) be less attention to loss-oriented and more to restoration-oriented tasks. For example, early in bereavement there is generally comparatively little attention to forming a new identity and far more to going over the events to do with the death, while

over time a gradual reversal in attention to these different aspects is likely to take place. Furthermore, as time goes on, the total amount of time spent on coping with loss and restoration tasks will diminish” (R. O. Hansson & M. S. Stroebe, 2007).

3.1. Conclusion

To sum up, the adjustment processes after the loss of a significant person have been theorized into successive models. In this section, the first and the more influential model of grief, the “grief work” model, has been briefly presented. Although broadly used, this model was shown to suffer from core limitations. In particular, we have seen that the “grief work hypothesis” (i.e., the necessity to confront the reality of the loss while avoiding it, is considered to be pathological) overshadowed the need to take into account the benefits of denial. Overriding these limitations, the M. J. Horowitz et al. (1993)’s model was next presented. Highly comprehensive with regard to describing the adjustment processes, this last model was reported to be an application of a widely constructed model of trauma that was not specifically related to bereavement features. Finally we presented a last model, specifically addressed to bereavement. Based on previous models of grief and widely specified in terms of processes (stressors, appraisal, coping, oscillation, etc.), this model has been shown to provide an integrated perspective of what the adjustment processes of grief are precisely..

Now that the adaptive processes of grieving are clarified, we can focus on their maladaptive counterpart (our mediational variables). Because the DPM appears to be the most comprehensive model, we plan to describe its related propositions with regard to the processes that might cause grief maladjustment.

4. When the grieving process is maladaptive

In addition to simply describing the processes that lead to favorable grief outcomes, the DPM framework also develops their maladaptive counterparts (e.g., M. S. Stroebe, Schut, & Stroebe, 2005). Two major types of processes thought to promote grief complications can be observed. The first evident one is a deficit in the flexible oscillation process between LO and RO (i.e., primarily LO, primarily RO or staccato fluctuations between LO and RO). The second one is a deficit in the flexible oscillation between negative and positive affect into loss- and restoration-orientations (i.e., primarily focus on

negative emotion). Each of these deficits, as well as their suggested related consequence on grief adjustment will be addressed in the two following sections¹.

4.1. Deficits in flexible oscillation between LO and RO: primarily LO, primarily RO or staccato fluctuations between LO and RO

A first deficit can be characterized by high preoccupation with and focus on loss orientation, evidencing little or no oscillation toward restoration orientation or lessening in intensity of grief over time. This deficit is supposed to be associated with the long-lasting presence of symptoms related to intense grief (rumination, preoccupation with thoughts of the deceased, and depressed mood) and the absence of apparent progress in coming to terms with the loss of a loved one (i.e., the equivalent of PGD).

A second deficit can be characterized by the tendency to focus quite exclusively on the tasks of restoration, avoiding loss orientation. This deficit is suggested to be associated to a form of *delayed* or *inhibited grief*² (Schut, Stroebe, de Keijser, & van den Bout, 1997), that can be identified when the person shows little or no sign of grieving early on in bereavement, although he or she may do so at a later stage.

¹ Most of the descriptions below are drawn from the publication of M. S. Stroebe et al. (2005).

² Although the DPM postulated that avoidance of confrontation with the emotion of grief will, among some individuals be associated with problematic adjustment, M. S. Stroebe et al. (2005) have proposed to be cautious with this type of complication. Indeed, they suggested that “delayed or inhibited grief may be difficult to distinguish from absent grief, in which the person continues on with life as though nothing had happened (although absence of symptoms does not always indicate pathology)” (M. S. Stroebe et al., 2005, p. 55). In addition, they proposed to be cautious with this type of complicated grief which, “despite consensus among traditional theorists (including Bowlby, 1980) that suppression of grief is harmful, is currently debate in the literature about the very existence of “delayed,” “absent,” or “inhibited” grief” (M. S. Stroebe et al., 2005, p. 55). On the basis of Fraley and Shaver (1999) which had discussed the problems associated with attempts to interpret absence of grief and its relationship to adjustment, M. S. Stroebe et al. (2005) have concluded that “suppression of grief may indeed be harmful for some, although such harmfulness may have been overestimated”. Accordingly, they have proposed to be cautious regarding to this category of grief complication”, while having claimed that “there seems reason enough to argue that a cognitive strategy involving avoidance of confrontation with the emotion of grief will, among some individuals (...) be associated with problematic adjustment.”

The third and last suggested deficit can be characterized by a disturbance of the natural oscillation process itself (cf. M.S. Stroebe & Schut, 2001) i.e. a staccato fluctuation of sometimes involuntary intrusion and avoidance similar to the type of intrusive recollection versus avoidance of traumatic events described by Horowitz (e.g., M. Horowitz, Wilner, & Alvarez, 1979). To be precise, the “healthy” oscillation differs from such traumatic confrontation–avoidance reactions in terms of intensity, persistence, and level of arousal. In traumatic confrontation–avoidance reactions, highly persistent distressing re-experiencing is actually combined with persistent efforts to avoid recollection. In regards to this deficit, *posttraumatic stress disorder* (PTSD) which is recognized as resulting from the experience of a trauma, is then finally associated. It would include traumatic bereavements such as multiple, precipitated, or homicidal deaths (M. S. Stroebe, Schut, & Finkenauer, 2001). Bereaved people who have experienced traumatic death are likely to present difficulties in controlling their anxiety and arousal and in keeping these emotions at a functional level (cf. Weiss & Marmar, 1997).

4.2. Too much focus on negative affect: the specific case of prolonged rumination

In the DPM, oscillation between positive and negative meanings, reappraisals and attributions has been theoretically introduced as a cognitive mechanism that underlie the ability to regulate grieving, which in turn contributes to progress through one’s grief (M.S. Stroebe & Schut, 2010). Accordingly, if negative thinking – namely rumination - is maintained relentlessly, adaptive oscillation between positive and negative affects/reappraisal is prevented and complications may develop. In the Nolen-Hoeksema studies (the work on which M.S. Stroebe and Schut (2010) have based their modelization), rumination has been shown to lead to depression and grief complication in bereaved individuals (Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Parker, & Larson, 1994).

4.3. DPM propositions: Empirical evidence

There is available evidence confirming the detrimental influence of the DPM maladaptive process (e.g., Boelen & Van Den Bout, 2010; Boelen, Van Den Bout, & Van Den Hout, 2010; Caserta & Lund, 2007; Richardson & Balaswamy, 2001; M.S. Stroebe &

Schut, 2008). However, the model (e.g., the oscillation processes) remains still quite poorly validated.

With regard to the specific process of rumination, nonetheless, recent important research has consistently confirmed the negative impact of such a process on prospective grief outcomes (e.g., Boelen, van den Bout, & van den Hout, 2006; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Michael & Snyder, 2005; Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema et al., 1997; Nolen-Hoeksema et al., 1994; Taku, Calhoun, Cann, & Tedeschi, 2008; van der Houwen, Stroebe, Schut, Stroebe, & van den Bout, 2010).

4.4. Conclusion

To sum up, according to the recent DPM framework, several maladaptive processes with regard to grief adjustment can be retained. They are specifically related to the perturbations of the oscillation process between LO and RO but also between negative and positive states. Each of them is differentially linked to maladaptive outcomes. Too much focus on the LO is associated with *chronic grief* while too much focus on the RO is associated to some kind of *absent grief*. In addition, staccato fluctuation between both orientations is associated to *PTSD*. Finally, too much focus on a negative state is thought to lead to depression and grief complications.

Now that the maladaptive processes of adjustment have been precisely depicted, our suggestion is to refer to a major theoretical framework in order to understand individual differences in the grieving processes. Specifically, we will see how the different (mal)adaptive processes can be adopted, and subsequently lead to differential patterns of grief, according to the bereaved individual's attachment style.

5. Insecure attachment: a risk factor for the development of maladaptive grieving process

Attachment theory is one of the most influential frameworks to understanding individual differences in emotion regulation in general, and in the functional and dysfunctional grieving process in particular (Mikulincer & Shaver, 2008). In Bowlby (1980)'s major work, it is argued that human beings are born with an innate psychobiological system, which is called the "attachment behavioral system". This attachment system engages human beings (of all ages) to seek proximity to protective

others (attachment figures) (or to active mental representations of them) as a means of managing threats and restoring emotional balance (Mikulincer & Shaver, 2007). Yet, this system is in itself an emotion regulation device that allows basic regulatory process (protection from threats and alleviation of distress) (P.R. Shaver & Mikulincer, 2007).

Interactions with attachment figures who are responsive, sensitive, and supportive in emotion-eliciting situations promote the regular functioning of the attachment system and boost the development of a stable sense of attachment security (Mikulincer & Shaver, 2013). According to Bowlby (1988), the sense of attachment security is crucial for maintaining emotional stability, developing a positive self-image and positive attitudes toward relationship partners (what Bowlby (1973) called internal working models) and forming mature, mutually satisfactory close relationships (Mikulincer & Shaver, 2008).

Unfortunately, when a person's attachment figures are not reliably available and supportive, and fail to provide adequate relief from distress, negative working models of self (as not sufficiently lovable) and others (as unaccepting and unresponsive) are formed, and secondary strategies (direct security seeking characterized the primary strategy) of affect regulation come into play (Mikulincer & Shaver, 2007). These secondary strategies are of two kinds: hyperactivation and deactivation of the attachment system (Cassidy & Kobak, 1988) (Mikulincer & Shaver, 2003). According to Mikulincer (2008), "Hyperactivation is characterized by energetic, insistent attempts to get a relationship partner, viewed as insufficiently available or responsive, to pay more attention and provide better care and support. Hyperactivating strategies include clinging, controlling, and coercive responses; cognitive and behavioral efforts to establish proximity, and overdependence on relationship partners as a source of protection (P. R. Shaver & Mikulincer, 2002). Deactivation refers to inhibition of proximity-seeking inclinations and actions, suppression of threats that might activate the attachment system, and determination to handle stresses alone. These strategies involve maintaining physical and emotional distance from others, being uncomfortable with intimacy and interdependence, downplaying threat- and attachment-related cues, and suppressing threat- and attachment-related thoughts (P. R. Shaver & Hazan, 1993)".

In examining individual differences in attachment-system functioning, researchers have focused on a person's attachment style (secure, anxious or avoidant) – "the chronic pattern of relational expectations, emotions, and behaviors that results from internalization of a particular history of attachment experiences" (Fraley & Shaver, 2000). Opening with Ainsworth, Blehar, Waters, and Wall (1978) studies of infant attachment and ongoing

through Hazan and Shaver (1987) conceptualization of romantic attachment, followed by many studies by social and personality psychologists (Mikulincer & Shaver, 2007), researchers have found that individual divergences in attachment style can be measured along two dimensions, attachment-related anxiety and avoidance (Brennan, Clark, & Shaver, 1998), which are roughly orthogonal. The two dimensions can be measured with a widely used reliable and valid self-report scale which is the Experience in Close Relationships Scale (ECR; Brennan et al., 1998)(see Appendix 1.).

A person's position on the anxiety dimension reflects the degree to which he or she worries that relationship partners will not be available in times of need, is frightened of being rejected or abandoned and relies on hyperactivating strategies. A person's position on the attachment avoidance dimension indicates the extent to which he or she distrusts the relationship partners' concern, struggles to maintain independence and emotional distance from partners and relies on deactivating strategies. People who score low on these both dimensions are mostly secure and tend to engage in constructive and effective affect-regulation strategies. Those who score high on either attachment anxiety or avoidance, or both), suffer from attachment insecurities and tend to use secondary attachment strategies (Cassidy & Kobak, 1988) in an effort to cope with threats, frustrations, losses, and insecurities (Mikulincer & Shaver, 2013).

Importantly, Mikulincer and Shaver (2007) have proposed that a person's location in the two-dimensional space defined by attachment anxiety and avoidance reflects both the person's sense of attachment security and the ways in which he or she deals with threats and stressors – emotion regulation. According to this perspective, each attachment style implies a series of cognitive, affective and behavioral actions which guide the emotion process – shape a person's appraisals of the situation, emotion-specific thoughts and actions tendencies and finally, expression, thoughts, behaviors and subjective feelings (P.R. Shaver & Mikulincer, 2007). Such actions or maneuvers consist in regulatory efforts which are aimed to alter, obstruct or suppress the generation, the activation or the expression of emotion (P.R. Shaver & Mikulincer, 2007).

While attachment security promote healthy flexible and reality-attuned regulatory process that allow emotions to be experienced and expressed without defensive distortion (Mikulincer & Shaver, 2008), attachment insecurities (anxiety and avoidance) contribute to distortion or denial of emotional experience, unconscious suppression of potentially functional emotions, dysfunctional rumination on threats and poor coping skills (Mikulincer & Shaver, 2007). Regarding to attachment anxiety, one can observe anxiously-

attached individuals to rely on hyperactivating strategies: present prominent intensification of undesirable emotions and this as an attempt to get more attention or to receive more reliable protection from their attachment figures (Mikulincer & Shaver, 2007). For example, anxiously-attached individuals tend to exaggerate the presence and seriousness of threats or shift their attention toward internal indicators of distress. They also tend to take ineffective courses of action that are likely to end in failure. Finally, they emphasize their sense of helplessness and vulnerability. All these strategies generate a self-amplifying cycle of emotional distress, which is sustained cognitively by ruminative thoughts and feelings even after threats objectively disappears (P.R. Shaver & Mikulincer, 2007).

In striking contrast with anxiously-attached individuals, one can observe avoidantly-attached ones to rely on deactivation strategies: avoid closeness and interdependence in relationships, inhibit their emotional experience, and deny vulnerability and this in order to avoid painful reactivation of their attachment system. For example, avoidantly-attached individuals tend to downplay threats and stop monitoring the availability of attachment figures. They also tend to emphasize their self-reliance and self-efficacy.

5.1. Attachment insecurities and disordered patterns of grief

Conceptualized as core emotion regulatory devices (Mikulincer & Shaver, 2007), attachment insecurities are strongly thought to influence the way in which bereaved individuals deal with the loss of a close relationship partner, as well as contribute to the apparition of disordered patterns of grief. Many theoretical publications have described how attachment-related worries and defenses may interfere with adaptive grief processing (e.g., Bowlby, 1980; Mikulincer & Shaver, 2013; K. M. Shear & Shair, 2005; M. S. Stroebe et al., 2005). Interestingly, a recent publication specifically clarified how the pattern of attachment affects (in)effective coping, namely the oscillation process between LO and RO coping strategies (M. S. Stroebe et al., 2005).

Appropriately assembled, the diverse theoretical assumptions could be summarized as follows. Anxiously-attached individuals are reluctant or unable to avoid or inhibit painful feelings, thoughts, and memories related to a deceased partner (e.g., persistent intrusion or rumination). One of the most salient characteristics of anxiously-attached people is definitely their inability to control the flow of painful attachment-related memories (e.g., Mikulincer & Orbach, 1995). This leads to excessive focus on LO orientation (M. S. Stroebe et al., 2005). In addition, anxiously-attached individuals tend to avoid or are unable to deal with a vast array of everyday life tasks on their own (e.g., RO tasks) (M. S. Stroebe

et al., 2005). This is in line with the fact that anxiously-attached individuals tend to possess negative views of themselves, to exaggerate even fairly minor threats, and to hold pessimistic beliefs about managing distress (for a review, see Mikulincer & Shaver, 2007). This leads to insufficient focus on RO orientation (M. S. Stroebe et al., 2005). As a result, anxiously-attached bereaved individuals are likely to experience intense preoccupation with the deceased, yearn inconsolably, fail to accept the loss, and have difficulty establishing new relationships, thereby making the optimal resolution of the bereavement process impossible (i.e., PGD).

In striking contrast, avoidant individuals are likely to downplay the importance of the loss, inhibit anxiety and despair, try to steer clear of thoughts and memories focused on the deceased and maintain their own ability to cope alone (Mikulincer & Shaver, 2013). This leads to insufficient focus on LO orientation (M. S. Stroebe et al., 2005). Accordingly, avoidantly-attached bereaved individuals are unwilling or unable to experience thoughts, feelings, and memories related to a deceased partner (e.g., LO tasks) (M. S. Stroebe et al., 2005), which makes it difficult to create meaning from the loss and integrate the lost relationship into a new reality.

5.2. Attachment and (mal)adaptive grief processes: Empirical evidence

In line with these theoretical assumptions, research has strongly shown that in contrast with secure attachment, attachment anxiety and avoidance can be viewed as significant risk factors for emotional and behavioral problems (for an extensive review, see Mikulincer & Shaver, 2007). Specifically, after the loss of a loved one, research has shown that attachment anxiety and avoidance are both likely to respectively promote PGD and absence of grief (e.g., Field & Sundin, 2001; Fraley & Bonanno, 2004; Jerga, Shaver, & Wilkinson, 2011; Wayment & Vierthaler, 2002).

However, even if attachment literature has been, one of the major theoretical frameworks to understanding adjustment in bereavement for decades, empirical studies which have confirmed the detrimental link between attachment insecurities remain rare. Moreover, the empirical studies investigating the cognitive processes that mediate such influences (e.g., Boelen & Klugkist, 2011; Boelen & Van Den Bout, 2010; Field & Sundin, 2001; van der Houwen, Stroebe, Schut, et al., 2010) are still at a preliminary state and need to be further completed.

5.3. Conclusion

In the previous sections we have described a powerful framework, attachment theory, which broadly explains the individual differences in emotion regulation (including cognitive processes) in general but also in the specific case of loss. The model specifically suggests differences in the choice of adaptive (e.g., flexible oscillation between LO and RO) or maladaptive processes (e.g., deficits in oscillation between LO and RO) according to the attachment style which leads to differential patterns of grief. Anxiously-attached individuals are expected to appraise the loss of their attachment figure in a very negative way and to focus exclusively on LO (e.g., yearning and rumination) as a result of which they are at greater risk of developing severe grief reactions. Extremely avoidantly-attached individuals, on the other hand, are expected to downplay the impact of the loss and focus exclusively on RO as a result of which they would be more prone to show fewer signs of grieving (i.e., absence of grieving in extreme cases).

This being said, we aim to focus on a particular maladaptive process, the excessive focus on LO, which was mostly assimilated in this thesis, under the concept of rumination.

6. Rumination

Rumination can be defined as a mental process of repetitive thought, namely thinking attentively, repetitively or frequently about one's self and one's world (Segerstrom, Stanton, Alden, & Shortridge, 2003). While briefly introduced in the DPM conceptualization (see above), rumination is a concept that has been, since two decades, increasingly theorized and empirically observed as a major maladaptive grieving process (Bonanno et al., 2005; Holman & Silver, 1998; Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema et al., 1997; Nolen-Hoeksema et al., 1994; Silver, Boon, & Stones, 1983; M.S. Stroebe et al., 2007; Tait & Silver, 1989; van der Houwen, Stroebe, Schut, et al., 2010).

While the rumination terminology (and its associated labels - e.g., ruminative coping, ruminative thoughts, intrusive rumination) has been commonly used in the bereavement literature, it is important to note that rumination is a theoretical concept, its meaning dependent on the way it is defined. Our aim in this next section is to present the rumination concept, specifically, a further in-depth look at the literature, quite hard to apprehend.

Even if recently recognized as a certainly maladaptive transdiagnostic process (Nolen-Hoeksema & Watkins, 2011) to finally be relatively clarified (see, E. R. Watkins, 2008), rumination has been specifically investigated in the bereavement field with sometimes the concept being adapted to the particular situation of loss (e.g., persistent thinking about the causes of the loss). In this context, rumination can be observed to be labeled, as well as described in different – or even contradictory – ways. Specific vigorous clarification is then clearly needed, and this in order to avoid important confusion (often still currently observed in the literature). This will be addressed in the present section by making clear distinctions across the different specific categorizations with which the rumination as repetitive thought can be found to be associated in the bereavement literature. These categorizations are summarized and displayed in Table 1.

Table 1. *Summary of the different categorizations (adaptive vs. maladaptive process; process vs. grief outcome) with which the rumination concept as a mental process of repetitive thought can be found to be associated in the bereavement literature*

Process	Grief outcome
Adaptive: Grief work /Grief processing	Adjustment: (not addressed in the present work)
Maladaptive: Ruminative coping (Nolen-Hoeksema, 2001) (see Appendix 11. for a complete review); “Intrusions” and “mental rumination” (our conceptualization)	Symptom: “Intrusions of grief” (Horowitz et al., 1993); “Yearning” (Prigerson, et al., 2009); “Rumination” (Shear et al., 2001)

When considering rumination, it is first worth highlighting that the rumination concept can be observed to be assimilated either to maladaptive processes (e.g., ruminative coping (Nolen-Hoeksema, 2001)) or specific grief symptoms (e.g., intrusions of grief; Horowitz et al., (1993)). For example, yearning for or preoccupation with the deceased which resembles rumination is a key symptom of PGD (Prigerson et al., 2009). Similarly, rumination is directly included as a criteria for PGD in Shear et al. (2011). Finally, the Stroebe and Schut (1999) conceptualization included rumination as a coping strategy (i.e., LO) but also as a symptom of what they called complicated grief (i.e., PGD). Accordingly, the literature appears strongly confusing. Yet, (coping) processes and symptoms have to be strictly distinguished if we aim to understand the underlying process of PGD. In the

present thesis, even if the distinction remains on a theoretical level, when rumination is mentioned, we are referring to rumination as a maladaptive - coping - process.

Another point that is important to highlight is that rumination as a maladaptive process can easily be confounded with adaptive cognitive processing (Bower, Kemeny, Taylor, & Fahey, 1998) - also called grief work (Freud, 1917/1957) or grief processing (Bonanno et al., 2005) - which usually takes place after the loss (see above) (see Table 1.). Maladaptive rumination, namely a process of repetitive thought (E. R. Watkins, 2008) indeed appears sometimes quite close from – or even assimilated to– adaptive grief processing which also includes processes of repetitive thinking. For example, rumination resembles the grief work concept characterized by C. M. Parkes (1972) as preoccupation with thoughts of the departed person, painful repetitious recollection of the loss experience and attempts to make sense of the loss or by M.S. Stroebe et al. (2007, p. 462) as “cognitive-emotional process involving confrontation with and recurring thoughts about a deceased person, the loss experience, and the changed world within which the bereaved person must now live”). Finally, the rumination concept is directly confounded with adaptive grief processing in C.M. Parkes (1996) and S. Shuchter and S. Zisook (1993) publications which emphasize that rumination can be considered as part of the grieving process. Similarly, rumination is directly projected as being part of the grieving process in Stroebe and Schut (DPM; 1999; 2010) who argue that rumination - if present at a certain extent - is a required process in coming to terms with loss.

The fact that rumination as a maladaptive process sometimes appears close to the general concept of grief processing has already been indicated by some researchers (e.g., M.S. Stroebe et al., 2007; M. S. Stroebe, 1992). To clearly distinguish rumination from grief processing, some theoretical suggestions have been offered. It has been for instance suggested that rumination may represent the maladaptive extreme of an adaptive coping strategy that M.S. Stroebe and Schut (1999) have designated as loss orientation (see above) (Nolen-Hoeksema, 2001). In the same line of reasoning, M.S. Stroebe et al. (2007) have suggested that higher scores on rumination will be associated with greater distress, while only at extreme levels will rumination be a problem. Accordingly, rumination was argued to be different from adaptive grief processing in terms of frequency/intensity (M.S. Stroebe et al., 2007). In conclusion, even if rumination as a maladaptive process and adaptive grief processing might share some common processes (i.e., repetitive style of thinking), these theoretical concepts clearly have to be differentiated and in fact, mostly in terms of degree of occurrence of the process (i.e., frequency/intensity).

At last, but not least, it is worth noting the various descriptions and ways of measurement in which the concept of rumination as a maladaptive process can be observed to entail in empirical research (see Appendix 11. for a complete report) (Bonanno et al., 2005; Garnefski, Kraaij, & Spinhoven, 2001; Holman & Silver, 1998; Nolen-Hoeksema, 2001; Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema et al., 1997; Nolen-Hoeksema et al., 1994; Silver et al., 1983; M.S. Stroebe et al., 2007; Tait & Silver, 1989; van der Houwen, Stroebe, Schut, et al., 2010). In the introduction, we have suggested a simplified definition of rumination as a repetitive thought. However, this definition only includes a characteristic common to several different descriptions and ways of measurement of rumination that can be found across the existing bereavement literature.

Originally depicted as “*passively and repetitively focusing on one’s symptoms of distress and the circumstance surrounding these symptoms*” (Nolen-Hoeksema, 1991), rumination has been assessed, in leading bereavement studies (e.g., Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema et al., 1994), with the 22-items Ruminative Responses Scale of the Response Styles Questionnaire (RRS; Nolen-Hoeksema & Morrow, 1991). Later, rumination has however been described in many different ways. For example, rumination has been represented as “*a form of extensive grief processing*” (e.g., thinking about the loss) that is self-perpetuating (Bonanno et al., 2005) or as “*repetitive thought focused on negative emotions and what these emotions mean without getting any closer to finding a solution that lessens these feelings*” (Michael & Snyder, 2005). This has led the rumination process to be assessed with specifically created rumination measure - the 13-items Grief Processing Scale (Bonanno et al., 2005) and the 7-items Rumination Index Questionnaire (RIQ) (Michael & Snyder, 2005), respectively. Another description has been provided by Taku et al. (2008) who have even distinguished between two different kinds of rumination that might arise after a life crisis: mostly automatic and intrusive thoughts about the event, and more deliberate rumination designed to make sense from the event. Assessment of rumination was then realized with a 14-item scale developed by Calhoun, Cann, Tedeschi, and McMillan (2000).

In regards to such various and sometimes contradictory descriptions (e.g., deliberate vs. automatic) of rumination as a maladaptive process, our suggestion is to distinguish between two types of maladaptive repetitive thought i.e. mental rumination and intrusions. Across the theoretical, as well as the empirical literature, two distinct repetitive process of thought certainly appear to emerge according to their respective mechanisms of action, as well as underlying cognitive processes. They are described below.

A first type of maladaptive repetitive thought is mental rumination (Nolen-Hoeksema, 2001). People ruminating are constantly focusing in a passive and repetitive way on their own negative emotions or symptoms of distress and on the possible causes and consequences of these emotions and symptoms. Rumination, even extreme rumination at an early stage after the loss, can be seen as a normal part of grieving (e.g., searching for meaning) (for a review, see Zech, 2006). However, in some cases, mental rumination can actually be maintained over time and become maladaptive.

The main maladaptive mechanisms of mental rumination could be explained as follows. Firstly, rumination may enhance the effects of distressed mood on thinking (see Bower et al., 1998), by making negative memories of the past, negative interpretations of the present, and negative predictions about the future more accessible and salient (Nolen-Hoeksema, 2001). Secondly, rumination may interfere with positive reappraisal and good problem-solving largely because people are thinking so negatively about themselves (e.g., they blame themselves additionally for their problems, are less self-confident) and their lives (their past and the future) (e.g., Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 1991) that it prevents them from attending to and processing new (mood incongruent) information (Joormann, 2010), thereby hindering the possibility to find positive meanings or innovative solutions to their problems and progress through grief. Thirdly, rumination may impair instrumental behaviors (Nolen-Hoeksema, 2001). People who ruminate are less motivated in participating and are actually engaging less in everyday activities, including social interactions which could increase their sense of control and lift their mood (Lyubomirsky & Nolen-Hoeksema, 1993). Hence, people who ruminate are less likely to distract themselves or get social support (e.g., Nolen-Hoeksema & Davis, 1999). Fourthly, people who express their ruminative thoughts over and over with family members and friends may experience criticism and rejection from said family members and friends (Nolen-Hoeksema, 2001).

Interestingly, mental rumination as deliberate pondering on one particular feature (e.g., the cause or the consequence) has been suggested to prevent the adaptive processing of confrontation with the reality of the loss (e.g., acceptance of the loss and the need to live without the loved one). Accordingly, even if previously suggested as being opposed to avoidant strategies such as denial or suppression (Nolen-Hoeksema, 2001), rumination has recently been assimilated to some maladaptive form of avoidance strategy (e.g., P. A. Boelen, J. van den Bout, et al., 2006; P. A. Boelen, M. A. van den Hout, & J. van den Bout, 2006; M.S. Stroebe et al., 2007). In the same line of reasoning, mental rumination that can

be associated to an abstract mode of thinking – i.e., the “why” or evaluative/analytical mode, which corresponds to an abstract way of representing the reasons why an event occurred, its meanings and implications, and elements that are common across multiple situations – has also been suggested to be a form of avoidance (e.g., of losing ties with the deceased) (E. R. Watkins, 2008; Watkins & Moulds, 2013).

Such persistent negative thinking was suggested to be underlined by a series of factors such as the belief that ruminative thinking helps in gaining insight, the desire to be loyal to the deceased, having a neurotic/pessimistic personality, etc. (Nolen-Hoeksema, 2001). Another important factor to us, because in line with the cognitive model of (mal)adaptive grief processing (see above), is a presumable deficit in cognitive inhibition (Joormann, 2010). In recent research (for a review, see Joormann, Yoon, & Zetsche, 2007), Joormann and her colleagues have indeed shown that rumination could be due to a difficulty in the effective monitoring of negative information in working memory (WM). Indeed, WM is a limited-system that provides temporary access to a select set of representations (Cowan, 1999). Given the limited capacity of this system, it is important that the contents of WM be controlled. Efficient functioning of WM depends on inhibitory processes that limit the access of information and that update/remove information that is no longer relevant for the task at hand (Hasher & Zacks, 1988). Consequently, deficits in inhibitory processes should allow intrusive thoughts to enter WM as well as preclude no-longer relevant thoughts from being deactivated. The resulting inability to control the contents in WM should prevent the maintenance of a coherent stream of thoughts and favor the appearance of unintended recurring thoughts that characterize rumination (Joormann, 2010). The previous findings appropriately assembled, we could suggest the following proposition: even if rumination can at first be seen as an intentional process (gaining insight, maintaining ties, etc.), such a process may become automatic in the long term, leading the individual to develop deficit in cognitive inhibition.

In contrast to mental rumination which is related to a prolonged processing of bereavement-related thoughts, intrusions are thoughts that intrude in the person’s mind without his or her will and which are usually transient as the individual strongly struggles to suppress them. These thoughts could be associated to a concrete mode of thinking – i.e., the “how” or experiential rumination, which corresponds to a concrete way of thinking, focusing on contextual details and concrete means to solve problems which correspond to confrontation (E. R. Watkins, 2008; E.R. Watkins & Moulds, 2013). In striking contrast with mental rumination, intrusive thought definitely brings up anxiety, horror, or

helplessness feelings. Overly directly related with the reality of the loss and then highly emotionally distressing, such intrusive thoughts are thus systematically avoided.

The frequency and intrusive characteristics of these thoughts can be explained by a different mechanism than the one proposed above for mental ruminations. In this case, the thoughts provoke such overwhelming anxiety feelings that the person tries to avoid them. Because the person avoids thinking about the event, the event cannot be integrated and thoughts reappear (e.g., Ehlers & Clark, 2000; M. J. Horowitz, Bonanno, & Holen, 1993). Intrusive thoughts will thus reemerge until the cognitive dissonance is resolved (Horowitz et al., 1993).

6.1. Conclusion

When introducing the concept of rumination, we suggested a simplified definition of rumination as a repetitive thought. However, this definition only includes a characteristic common to several different descriptions of rumination that can be found across the existing bereavement literature. To clarify the observed confusion in the literature, several distinctions have been recommended. First, rumination as a maladaptive process and rumination as a specific grief symptom have been suggested to be clearly distinguished. Second, rumination as a maladaptive process and rumination as an adaptive grieving process have also been suggested to be differentiated. Finally, upon a systematic review of the literature on rumination as a maladaptive process, we have cleared the concept up by suggesting that bereaved people may encounter two types of repetitive thoughts namely mental ruminations and intrusions that lead to complication according to different mechanisms and which are underlined by differential cognitive processes.

Because the concept of (deficits in) cognitive inhibition has been suggested to intervene in the occurrence of rumination, it is developed in the following section.

7. Cognitive inhibition

Cognitive inhibition has been theorized in numerous ways, causing the meaning of the term to be often broad and inconsistent depending on the various authors (for a comprehensive review, see Fournet, Mosca, & Moreaud, 2007). With regard to such an extended concept, several attempts of classifications have been brought forward. Harnishfeger (1995) for example, defined inhibition processes according to three dimensions: (a) the degree of intention or conscious awareness of the inhibition; (b) the

cognitive or the behavioral level in which inhibition takes place; (c) the distinction between (1) preventing irrelevant information or distracting stimuli from entering working memory (WM) and (2) the active suppression process on the content of WM. Based on Harnishfeger (1995)'s suggestions, Nigg (2000) further classified four types of effortful inhibitory processes: (a) preventing irrelevant information or distracting stimuli from entering WM; (b) the suppression of irrelevant information from WM; (c) the suppression of prepotent response; and (d) the suppression of reflexive saccades.

It is worth noting that these inhibition-related functions are suggested as operating at different stages of the information processing (Fournet et al., 2007; Friedman & Miyake, 2004). Inhibition of irrelevant information or distracting stimuli from entering WM is supposed to intervene at an initial perceptual stage of processing, where relevant information must be selected and irrelevant information must be ignored. Information monitoring and updating is supposed to intervene at an intermediate level, once information has entered working memory and must be suppressed. Finally, inhibition of prepotent response is supposed to intervene at a later output stage of the processing, in which relevant responses must be selected and incorrect ones resisted (Friedman & Miyake, 2004).

The existence of such inhibition-related functions has been recently tested in empirical studies. Among others, Miyake et al. (2000) have confirmed the existence of three inhibition-related functions: (a) mental set shifting; (b) information monitoring and updating; and (c) inhibition of prepotent response. Later, Friedman and Miyake (2004) have further confirmed the existence of two distinct inhibition-related functions: (a) information monitoring and updating and (b) inhibition of (1) distractor and (2) prepotent response.

While such preliminary studies have provided important findings with regard to the concept of cognitive inhibition, further thorough investigation into it is still strongly needed.

7.1. Deficits in cognitive inhibition and their consequences in information processing

Beyond the determination of diverse cognitive-inhibitory functions, interestingly, deficits in the control of irrelevant information that enters into WM (an inhibition-related function called below control of the access) and the inhibition of no longer relevant information in WM (an inhibition-related function called below WM updating) have been

suggested to lead to excessive irrelevant information getting into WM but also maintained in it (Hasher & Zacks, 1988; Joormann, 2010; Stoltzfus, Hasher, & Zacks, 1996). This would in turn lead the individual to be easily distracted by irrelevant information and thoughts which may result in a disruptively coherent stream of thought. Such a concept fits pretty-well with major features of (mal)adaptive processes of grief adjustment (e.g., Horowitz et al., (1993)'s notion of optimal dosing -trough control/inhibition processes- of grief-related information ; the Stroebe et al. (1999; 2010) notion of deficit in flexible oscillation with persistent attentional focus on LO) and specifically with prolonged rumination. Accordingly cognitive inhibition (control of the access and WM updating) seems important as a concept to understand the underlying cognitive processes of prolonged processing of negative grief-related information.

For over a decade, increasing empirical studies have tested whether a deficit in cognitive inhibition would have an impact on the development and the maintenance of depressive rumination (rumination in the depressive field). Consistently, such studies have shown that deficits in cognitive inhibition were related to higher rumination (for an extensive review, see Joormann, 2010; Joormann et al., 2007). In the bereavement field, no studies have investigated the potential relationship between such deficits in cognitive inhibition and in persistent rumination. Given that rumination is known to be a transdiagnostic process (Ehring & Watkins, 2008; Nolen-Hoeksema & Watkins, 2011), we might expect the findings observed in the depression field to also be found in the bereavement one.

7.2. Conclusion

It is suggested that cognitive inhibition abilities or functions intervene in the effective information processing - the selection and the active monitoring of information in working memory (WM) that are relevant with the individual's goals. Conversely, deficits in such inhibition abilities or functions are suggested as a perturbation to operative information processing which could explain why sometimes the grieving process lingers on in a dysfunctional way.

As we now know much more about the specific underlying cognitive processes that could underlie grief symptomatology, we will aim to present the various studies which have been specifically conducted in order to address them.

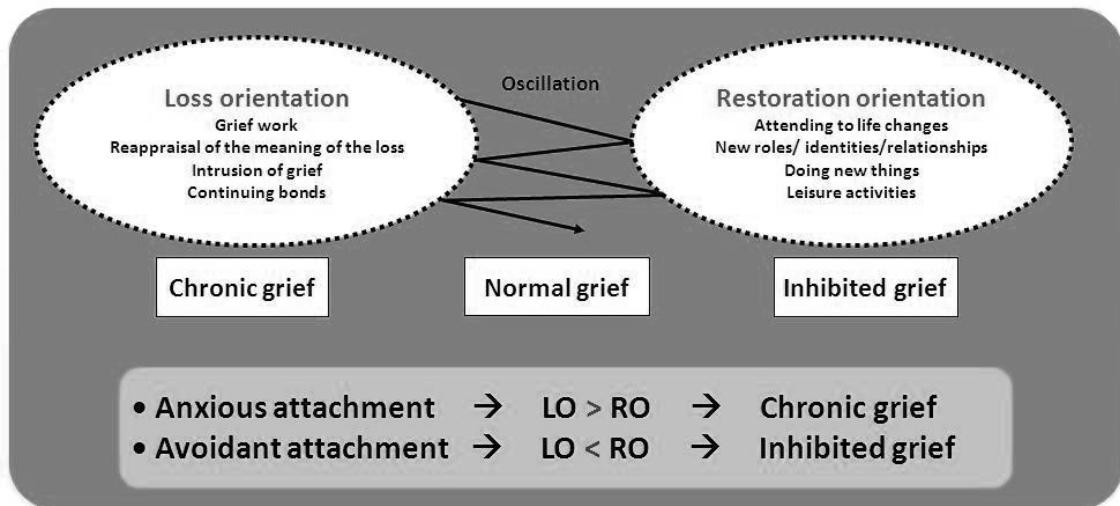
8. The present thesis

In the introduction, we explained the need to further investigate the underlying cognitive processes of damaging grief outcomes. With regard to these processes, and following a recent integrative model (the DPM), it is argued that oscillation deficits between LO and RO, as well as oscillation deficits between negative and positive states/appraisals should lead to detrimental adjustments. In the present thesis, we aim to further investigate both these oscillatory deficits through successive studies. The following studies are briefly introduced below.

8.1. Attachment and severity of grief: The mediating role of negative appraisal and inflexible coping (Study 1)

In the bereavement field, a major body of literature has consistently shown that insecure attachments (risk factor) strongly predict grief complications. However, the cognitive mediational processes (mediators) which could explain such associations remain mostly unidentified. In a recent publication, it was suggested that different coping styles (i.e., primarily LO or RO) are adopted by, and are differentially effective for, bereaved people according to their style of attachment (M. S. Stroebe et al., 2005). Specifically, extremely anxious or avoidant attachment is postulated to disturb the oscillation process by focusing more on one type of strategy, either LO or RO (see Figure 1.). This should in turn lead to greater or fewer grief reactions. These hypotheses will be tested in the first study.

Figure 1. Dual Process model (DPM; M.S. Stroebe & Schut, 1999; 2010) revised on the basis of the formulations of M. S. Stroebe et al. (2005).



8.2. Why Do Bereaved Partners Experience Interfering Rumination? Evidence for Deficits in Cognitive Inhibition (Study 2 & 3)

While the link between persistent rumination (i.e., primarily focus on negative affect) and numerous grief complications has already been displayed by Nolen-Hoeksema and her colleagues (for a review, see Nolen-Hoeksema, 2001) and moreover further abundantly investigated by other studies (out of the DPM framework), the reason why rumination might persist for a long time remains fairly unknown. Preliminary elements explaining the maintenance of negative ruminative thinking can be found in the M. J. Horowitz et al. (1993) model but also in rumination research in the depression field.

On the basis of both these lines of research, control/inhibition processes (M. J. Horowitz et al., 1993) or cognitive inhibition (Joormann, 2010) appears to be a core factor that could explain why rumination can persist across time. With respect to the fact that rumination is considered as a transdiagnostic process (Ehring & Watkins, 2008; Nolen-Hoeksema & Watkins, 2011) we could expect the underlying processes of rumination empirically revealed in depressed individuals to be similar to those in bereaved individuals.

Accordingly, we will examine the link between inhibition deficits and rumination in bereaved individuals in two successive studies. We will first specifically investigate whether deficits in the access limitation of negative and grief-related information might be linked to higher rumination frequency (study 2). We will then investigate whether deficits in negative

and grief-related information suppression might be linked to higher rumination frequency (study 3).

9. Conclusion

In addition to clearly identifying the risk factors (i.e., distal risk factors (Nolen-Hoeksema & Watkins, 2011)) that could promote the development of enduring grief symptomatology, it is also argued that an effective intervention requires targeting the processes (i.e., proximal risk factors (Nolen-Hoeksema & Watkins, 2011)) which might explain the link between more distal risk factors and subsequent dysfunctional grief outcomes. Accordingly, it seems crucial to properly grasp the processes that underlie the development and the maintenance of dysfunctional symptoms (Zech et al., 2010). Major models of the adaptive grief processing, as well as its dysfunctional counterpart, have been brought forward since the second half of the 20th century. Interestingly, it seems like the core business of grief (e.g., grief work) more or less directly implies a cognitive process of integration of the loss into preexisting knowledge. Accordingly, the central process of grief (mal)adjustment has been suggested to be of a cognitive kind. Empirical investigation of such cognitive process is still greatly needed. The aim of the present thesis is to further investigate the dysfunctional cognitive processes which mediate the link between major risk factors (e.g., attachment insecurity) and prospective debilitating grief reactions. Successive studies focusing on such processes will be conducted.

10. References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: Assessed in the Strange Situation and at home*. Hillsdale, NJ: Erlbaum.
- APA. (2012). *Diagnostic and statistical manual of mental disorders* (4th edn. Text Revision ed.). Washington, DC: American Psychiatric Association.
- Boelen, P. A., & Klugkist, I. (2011). Cognitive behavioral variables mediate the associations of neuroticism and attachment insecurity with Prolonged Grief Disorder severity. *Anxiety Stress Coping*, 24(3), 291-307. doi: 10.1080/10615806.2010.527335
- Boelen, P. A., & Prigerson, H. G. (2013). Prolonged grief disorder as a new diagnostic category in DSM-5. In M.S. Stroebe, H. Schut & J. van den Bout (Eds.), *Complicated grief. Scientific foundations for health care professionals* (pp. 85-98). Routledge: London and New York.
- Boelen, P. A., van de Schoot, R., van den Hout, M. a., de Keijser, J., & van den Bout, J. (2010). Prolonged Grief Disorder, depression, and posttraumatic stress disorder are distinguishable syndromes. *Journal of Affective Disorders*, 125(1-3), 374-378. doi: DOI: 10.1016/j.jad.2010.01.076
- Boelen, P. A., & van den Bout, J. (2008). Complicated grief and uncomplicated grief are distinguishable constructs. *Psychiatry research*, 157(1-3), 311-314. doi: 10.1016/j.psychres.2007.05.013
- Boelen, P. A., & Van Den Bout, J. (2010). Anxious and depressive avoidance and symptoms of Prolonged Grief, depression, and Post-Traumatic Stress Disorder. *Psychologica Belgica*, 50(1-2), 49-67. doi: 10.1371/journal.pmed.1000121
- Boelen, P. A., van den Bout, J., & van den Hout, M. A. (2006). Negative cognitions and avoidance in emotional problems after bereavement: a prospective study. *Behaviour Research and Therapy*, 44(11), 1657-1672. doi: 10.1016/j.brat.2005.12.006
- Boelen, P. A., Van Den Bout, J., & Van Den Hout, M. A. (2010). A prospective examination of catastrophic misinterpretations and experiential avoidance in emotional distress following loss. *Journal of Nervous and Mental Disease*, 198(4), 252-257. doi: 10.1097/NMD.0b013e3181d619e4
- Boelen, P. A., van den Hout, M. A., & van den Bout, J. (2006). A cognitive-behavioral conceptualization of complicated grief. *Clinical Psychology: Science and Practice*, 13, 109-128.

- Boelen, P. A., van den Hout, M. A., & van den Bout, J. (2006). A cognitive-behavioral conceptualization of complicated grief. *Clinical Psychology: Science and Practice*, 13(2), 109-128. doi: 10.1111/j.1468-2850.2006.00013.x
- Bonanno, G. A., & Kaltman, S. (1999). Toward an integrative perspective on bereavement. *Psychological Bulletin*, 125, 760-776.
- Bonanno, G. A., Keltner, D., Holen, A., & Horowitz, M. J. (1995). When avoiding unpleasant emotions might not be such a bad thing: Verbal-autonomic response dissociation and midlife conjugal bereavement. *Journal of Personality and Social Psychology*, 69, 975-989.
- Bonanno, G. A., Lehman, D. R., Tweed, R. G., Haring, M., Wortman, C. B., Sonnega, J., . . . Nesse, R. M. (2002). Resilience to loss and chronic grief: A prospective study from preloss to 18-months postloss. *Journal of Personality and Social Psychology*, 83(5), 1150-1164. doi: 10.1037//0022-3514.83.5.1150
- Bonanno, G. A., & Mancini, A. D. (2008). The human capacity to thrive in the face of potential trauma. *Pediatrics*, 121(2), 369-375. doi: 10.1542/peds.2007-1648
- Bonanno, G. A., Neria, Y., Mancini, A., Coifman, K. G., Litz, B., & Insel, B. (2007). Is there more to complicated grief than depression and posttraumatic stress disorder? A test of incremental validity. *Journal of abnormal psychology*, 116(2), 342-351. doi: 10.1037/0021-843X.116.2.342
- Bonanno, G. A., Papa, A., Lalande, K., Zhang, N., & Noll, J. G. (2005). Grief processing and deliberate grief avoidance: A prospective comparison of bereaved spouses and parents in the United States and the People's Republic of China. *Journal of Consulting and Clinical Psychology*, 73(1), 86-98. doi: 10.1037/0022-006X.73.1.86
- Bower, J. E., Kemeny, M. E., Taylor, S. E., & Fahey, J. L. (1998). Cognitive processing, discovery of meaning, CD4 decline, and AIDS- related mortality among bereaved HIV-seropositive men. *Journal of Consulting and Clinical Psychology*, 66(6), 979-986. doi: 10.1037/0022-006x.66.6.979
- Bowlby, J. (1973). *Attachment and loss* (Vol. 2 Separation). New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss* (Vol. 3 Sadness and depression Separation). New York: Basic Books.
- Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. London: Routledge.

- Brennan, K. A., Clark, C. L., & Shaver, P. R. I. (1998). Self-report measurement of adult romantic attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
- Calhoun, L. G., Cann, A., Tedeschi, R. G., & McMillan, J. (2000). A correlational test of the relationship between posttraumatic growth, religion, and cognitive processing. *Journal of Traumatic Stress, 13*, 521-527.
- Caserta, M. S., & Lund, D. A. (2007). Toward the development of an inventory of daily widowed life (IDWL): guided by the dual process model of coping with bereavement. *Death Studies, 31*(6), 505-535. doi: 10.1080/07481180701356761
- Cassidy, J., & Kobak, R. R. (1988). Avoidance and its relationship with other defensive processes. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 300-323). Hillsdale: Erlbaum.
- Cowan, N. (1999). An embedded-processes model of working memory. In A. Miyake & P. Shah, P. (Eds.), *Models of working memory: Mechanisms of active maintenance and executive control* (pp. 62-101). Cambridge: University Press.
- Ehlers, A., & Clark, D. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 28*, 319-345.
- Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy, 1*(3), 192-205. doi: 10.1521/ijct.2008.1.3.192
- Field, N. P., Gao, B., & Paderna, L. (2005). Continuing bonds in bereavement: An attachment theory based perspective. *Death Stud, 29*(4), 277-299. doi: 10.1080/07481180590923689
- Field, N. P., & Sundin, E. C. (2001). Attachment style in adjustment to conjugal bereavement. *Journal of Social and Personal Relationships, 18*(3), 347-361.
- Folkman, S. (2001). Revised coping theory and the process of bereavement. In M. S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 563-584). Washington, DC, US: American Psychological Association.
- Fournet, N., Mosca, C., & Moreaud, O. (2007). Deficits in inhibitory processes in normal aging and patients with Alzheimer's disease: A review. *Déficits des processus inhibiteurs dans le vieillissement normal et la maladie d'Alzheimer, 5*(4), 281-294. doi: 10.1684/pnv.2007.0103

- Fraley, R. C., & Bonanno, G. A. (2004). Attachment and loss: A test of three competing models on the association between attachment-related avoidance and adaptation to bereavement. *Personality and Social Psychology Bulletin*, 30(7), 878-890. doi: 10.1177/0146167204264289
- Fraley, R. C., & Shaver, P. R. (2000). Adult romantic attachment: Theoretical developments, emerging controversies, and unanswered questions. *Review of General Psychology*(4), 132-154.
- Freud, S. (1917/1957). Mourning and melancholia. In J. Strachey (Ed.), *The standard edition of the complete works of Sigmund Freud* (Vol. 14, pp. 152-170). London: Hogarth Press.
- Friedman, N. P., & Miyake, A. (2004). The relations among inhibition and interference control functions: a latent-variable analysis. *Journal of experimental psychology: General*, 133(1), 101-135. doi: 10.1037/0096-3445.133.1.101
- Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences*, 30(8), 1311-1327. doi: 10.1016/s0191-8869(00)00113-6
- Hansson, R. O., & Stroebe, M. S. (2007). Coping with bereavement. In R. O. Hansson & M. S. Stroebe (Eds.), *Bereavement in late life: Coping, adaptation, and developmental influences* (pp. 25-40). Washington, DC: American Psychological Association.
- Hansson, R. O., & Stroebe, M. S. (2007). The dual process model of coping with bereavement and development of an integrative risk factor framework. In R. O. Hansson & M. S. Stroebe (Eds.), *Bereavement in late life: Coping, adaptation, and developmental influences* (pp. 41-60). Washington, DC: American Psychological Association.
- Harnishfeger, K. K. (1995). The development of cognitive inhibition : theories, definitions and research evidence. In F. N. Dempster & C. J. Brainerd (Eds.), *Interference and inhibition in cognition* (pp. 175-204). San Diego: Academic Press.
- Hasher, L., & Zacks, R. T. (1988). Working memory, comprehension, and aging: A review and a new view. In G. H. Bower (Ed.), *The psychology of learning and motivation* (pp. 193-225). San Diego, CA: Academic Press.
- Holman, E. A., & Silver, R. C. (1998). Getting "stuck" in the past: Temporal orientation and coping with trauma. *Journal of Personality and Social Psychology*, 74(5), 1146-1163. doi: 10.1037/0022-3514.74.5.1146
- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A study of subjective stress. *Psychosomatic Medicine*(41), 209-218.

- Horowitz, M. J. (1986). *Stress Response Syndromes* (2nd ed.). Northvale, NJ: Aronson.
- Horowitz, M. J., Bonanno, G. A., & Holen, A. (1993). Pathological grief: Diagnosis and explanation. *Psychosomatic Medicine*, 55(3), 260-273.
- Horowitz, M. J., Siegel, B., Holen, A., Bonanno, G. A., Milbrath, C., & Stinson, C. H. (1997). Diagnostic criteria for complicated grief disorder. *American Journal of Psychiatry*, 154(7), 904-910.
- Jerga, A. M., Shaver, P. R., & Wilkinson, R. B. (2011). Attachment insecurities and identification of at-risk individuals following the death of a loved one. *Journal of Social and Personal Relationships*, 28(7), 891-914. doi: 10.1177/0265407510397987
- Joormann, J. (2010). Cognitive inhibition and emotion regulation in depression. *Current Directions in Psychological Science*, 19(3), 161-166. doi: 10.1177/0963721410370293
- Joormann, J., Yoon, K. L., & Zetsche, U. (2007). Cognitive inhibition in depression. *Applied and Preventive Psychology*, 12(3), 128-139. doi: 10.1016/j.appsy.2007.09.002
- Kavanagh, D. J. (1990). Towards a cognitive-behavioural intervention for adult grief reactions. *British Journal of Psychiatry*, 157, 373-383.
- Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lindemann, E. M. D. (1944). Symptomatology and management of acute grief. *American Journal of Psychiatry*(101), 141-148.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality and Social Psychology*, 65, 339-349.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality and Social Psychology*, 69, 176-190.
- Michael, S. T., & Snyder, C. R. (2005). Getting unstuck: the roles of hope, finding meaning, and rumination in the adjustment to bereavement among college students. *Death Studies*, 29(5), 435-458. doi: 10.1080/07481180590932544
- Mikulincer, M. (2008). An attachment perspective on disordered grief reactions and the process of grief resolution. *Grief Matters*, 11, 1-14.
- Mikulincer, M., & Orbach, I. (1995). Attachment Styles and Repressive Defensiveness: The Accessibility and Architecture of Affective Memories. *Journal of Personality and Social Psychology*, 68(5), 917-925.
- Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioral system in adulthood: Activation, psychodynamics, and interpersonal processes. In M. P. Zanna (Ed.),

- Advances in experimental social psychology* (Vol. 35, pp. 53-152). New York: Academic Press.
- Mikulincer, M., & Shaver, P. R. (2007). Attachment processes and emotion regulation. In M. Mikulincer & P. R. Shaver (Eds.), *Attachment in adulthood. Structure, dynamics, and change* (pp. 188-218). The Guilford Press: New York London.
- Mikulincer, M., & Shaver, P. R. (2008). An attachment perspective on bereavement. In M. S. Stroebe, R. O. Hansson, H. Schut & W. Stroebe (Eds.), *Handbook of bereavement research and practice: Advances in theory and intervention* (pp. 87-112). Washington, DC: American Psychological Association.
- Mikulincer, M., & Shaver, P. S. (2013). Attachment insecurities and disordered patterns of grief. In M.S. Stroebe, H. Schut & J. van den Bout (Eds.), *Complicated grief. Scientific foundations for health care professionals* (pp. 190-203). Routledge: London and New York.
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "Frontal Lobe" tasks: a latent variable analysis. *Cognitive psychology*, 41(1), 49-100. doi: 10.1006/cogp.1999.0734
- Neimeyer, R. (2001). *Meaning reconstruction and the experience of the loss*. Washington, D. C.: American Psychological Association.
- Nigg, J. T. (2000). On inhibition/disinhibition in developmental psychopathology: views from cognitive and personality psychology and a working inhibition taxonomy. *Psychological bulletin*, 126(2), 220-246.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100(4), 569-582.
- Nolen-Hoeksema, S. (2001). Ruminative coping and adjustment to bereavement *Handbook of bereavement research: Consequences, coping, and care*. (pp. 545-562): Washington, DC, US: American Psychological Association.
- Nolen-Hoeksema, S., & Davis, C. G. (1999). "Thanks for sharing that": Ruminators and their social support networks. *Journal of Personality and Social Psychology*, 77, 801-814.
- Nolen-Hoeksema, S., & Larson, J. (1999). *Coping with loss*. Mahwah, NJ: Erlbaum.
- Nolen-Hoeksema, S., McBride, A., & Larson, J. (1997). Rumination and psychological distress among bereaved partners. *Journal of Personality and Social Psychology*, 72(4), 855-862.

- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, 61(1), 115-121.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology*, 67(1), 92-104.
- Nolen-Hoeksema, S., & Watkins, E. R. (2011). A heuristic for developing transdiagnostic models of psychopathology: Explaining multifinality and divergent trajectories. *Perspectives on Psychological Science*, 6(6), 589-609. doi: 10.1177/1745691611419672
- Parkes, C. M. (1972). *Bereavement. Studies of grief in adult life* (1 ed.). London: Tavistock Publications.
- Parkes, C. M. (1972/1996). *Bereavement: Studies of grief in adult life*. London: Routledge.
- Parkes, C. M. (1996). *Bereavement: studies of grief in adult life* (3 ed.). Tavistock Routledge, London
- Pennebaker, J. W., Zech, E., & Rimé, B. (2001). Disclosing and sharing emotion: Psychological, social and health consequences. In M.S. Stroebe, W. Stroebe, R. O. Hansson & H. Schut (Eds.), *New Handbook of Bereavement: Consequences, Coping, and Care* (pp. 517-544). Washington, D. C.: American Psychological Association.
- Plagnol, A. (2003). Psychologie cognitive et psychopathologie. In B. Granger (Ed.), *La Psychiatrie d'aujourd'hui*. Paris: Odile Jacob.
- Prigerson, H. G., Frank, E., Kasl, S. V., Reynolds, C. F., 3rd, Anderson, B., Zubenko, G. S., . . . Kupfer, D. J. (1995). Complicated grief and bereavement-related depression as distinct disorders: preliminary empirical validation in elderly bereaved spouses. *The American Journal of Psychiatry*, 152(1), 22-30.
- Prigerson, H. G., Horowitz, M. J., Jacobs, S. C., Parkes, C. M., Aslan, M., Goodkin, K., . . . Maciejewski, P. K. (2009). Prolonged grief disorder: Psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Medicine*, 6(8). doi: 10.1371/journal.pmed.1000121
- Prigerson, H. G., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: A rationale, consensus criteria, and a preliminary empirical test. In M. S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 613-645). Washington, DC, US: American Psychological Association, Washington, DC.

- Prigerson, H. G., Shear, M. K., Jacobs, S. C., Reynolds Iii, C. F., Maciejewski, P. K., Davidson, J. R. T., . . . Zisook, S. (1999). Consensus criteria for traumatic grief: A preliminary empirical test. *British Journal of Psychiatry*, 174(JAN.), 67-73.
- Richardson, V., & Balaswamy, S. (2001). Coping with bereavement among elderly widowers. *Omega: Journal of Death and Dying*, 43, 129-144.
- Schut, H. A. W., Stroebe, M. S., de Keijser, J., & van den Bout, J. (1997). Intervention for the bereaved: Gender differences in the efficacy of grief counselling. *British Journal of Clinical Psychology*(36), 63-72.
- Segerstrom, S. C., Stanton, A. L., Alden, L. E., & Shortridge, B. E. (2003). A multidimensional structure for repetitive thought: what's on your mind, and how, and how much? *Journal of personality and social psychology*, 85(5), 909-921. doi: 10.1037/0022-3514.85.5.909
- Shaver, P. R., & Hazan, C. (1993). Adult romantic attachment: Theory and evidence. In D. Perlman & W. Jones (Eds.), *Advances in personal relationships* (Vol. 4, pp. 29-70). London: Kingsley.
- Shaver, P. R., & Mikulincer, M. (2002). Attachment-related psychodynamics. *Attachment and Human Development*, 4(2), 133-161. doi: 10.1080/14616730210154171
- Shaver, P. R., & Mikulincer, M. (2007). Adult attachment strategies and the regulation of emotion. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 446-465). New York: Guilford Press.
- Shear, K. M., & Shair, H. (2005). Attachment, loss, and complicated grief. *Developmental Psychobiology*, 47, 253-267.
- Shear, M. K., Simon, N., Wall, M., Zisook, S., Neimeyer, R., Duan, N., . . . Keshaviah, A. (2011). Complicated grief and related bereavement issues for DSM-5. *Depression and Anxiety*, 28(2), 103-117. doi: 10.1002/da.20780
- Shuchter, S., & Zisook, S. (1993). The course of normal grief. In M.S. Stroebe, R. O. Hansson & W. Stroebe (Eds.), *Handbook of bereavement: theory, research, and intervention* (pp. 23-43). Cambridge, New York.
- Shuchter, S. R., & Zisook, S. (1993). The course of normal grief. In M. S. Stroebe, W. Stroebe & R. O. Hansson (Eds.), *Handbook of bereavement: Theory, research, and intervention*. New York: Cambridge University Press.
- Silver, R. L., Boon, C., & Stones, M. H. (1983). Searching for meaning in misfortune: Making sense of incest. *Journal of Social Issues*, 39, 81-102.

- Stoltzfus, E. R., Hasher, L., & Zacks, R. T. (1996). Working memory and aging : current status and new view. In J. T. E. Engle, L. Hasher, R. L. Logie, E. R. Stoltzfus & R. T. Zacks (Eds.), *Working memory and human cognition* (pp. 66-88). New York: Oxford University Press.
- Stroebe, M.S., Boelen, P. A., van den Hout, M.S., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance: a reinterpretation of its function in adjustment to bereavement. *European Archives of Psychiatry and Clinical Neuroscience*, 257(8), 462-472. doi: 10.1007/s00406-007-0746-y
- Stroebe, M.S., Folkman, S., Hansson, R. O., & Schut, H. (2006). The prediction of bereavement outcome: Development of an integrative risk factor framework. *Social Science & Medicine*, 63, 2440-2451. doi: 10.1016/j.socscimed.2006.06.012
- Stroebe, M.S., & Schut, H. (1999). The dual process model of coping with bereavement: Rationale and description. *Death Studies*, 23(3), 197-224. doi: 10.1080/074811899201046
- Stroebe, M.S., & Schut, H. (2001). Models of coping with bereavement: A review. In M.S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 375-403). Washington, DC: American Psychological Association.
- Stroebe, M.S., & Schut, H. (2008). The Dual Process Model of Coping with Bereavement: Overview and update. *Grief Matters: The Australian Journal of Grief and Bereavement*, 11, 1-4.
- Stroebe, M.S., & Schut, H. (2010). The dual process model of coping with bereavement: A decade on. *Omega: Journal of Death and Dying*, 61(4), 273-289. doi: 10.2190/OM.61.4.b
- Stroebe, M. S. (1992). Coping with bereavement: a review of the grief work hypothesis. *Omega: Journal of Death and Dying*, 26 (1), 19-42.
- Stroebe, M. S., Schut, H., & Finkenauer, C. (2001). The traumatization of grief: A conceptual framework for understanding the trauma-bereavement interface. *Israel Journal of Psychiatry*, 38, 185-201.
- Stroebe, M. S., Schut, H., & Stroebe, W. (2005). Attachment in Coping With Bereavement: A Theoretical Integration. *Review of General Psychology*, 9(1), 48-66. doi: 10.1037/1089-2680.9.1.48
- Stroebe, M. S., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *Lancet*, 370(9603), 1960-1973. doi: 10.1016/s0140-6736(07)61816-9

- Tait, R., & Silver, R. C. (1989). Coming to terms with major negative life events. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 351-382). New York: Guilford.
- Taku, K., Calhoun, L. G., Cann, A., & Tedeschi, R. G. (2008). The role of rumination in the coexistence of distress and posttraumatic growth among bereaved Japanese university students. *Death Studies*, 32(5), 428-444. doi: 10.1080/07481180801974745
- van der Houwen, K., Stroebe, M.S., Schut, H., Stroebe, W., & van den Bout, J. (2010). Mediating processes in bereavement: the role of rumination, threatening grief interpretations, and deliberate grief avoidance. *Social Science and Medicine*, 71(9), 1669-1676. doi: 10.1016/j.socscimed.2010.06.047
- van der Houwen, K., S., M., Stroebe, W., Shut, H., van de Bout, J., & Wijngaards-De Meij, L. (2010). Risk Factors for Bereavement Outcome: A Multivariate Approach. *Death Studies*, 34(3), 195-220. doi: 10.1080/07481180903559196
- Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, 134(2), 163-206. doi: 10.1037/0033-2909.134.2.163
- Watkins, E. R., & Moulds, M. L. (2013). Repetitive thought. Rumiantion in complicated grief. In M.S. Stroebe, H. Schut & J. van den Bout (Eds.), *Complicated grief. Scientific foundations for health care professionals* (pp. 162-175). Routledge: London and New York.
- Wayment, H. A., & Vierthaler, J. (2002). Attachment style and bereavement reactions. *Journal of Loss and Trauma*, 7(2), 129-149. doi: 10.1080/153250202753472291
- Weiss, D. S., & Marmar, C. R. (1997). The Impact of Event Scale-Revised. In J. P. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 399-411). New York: Guilford Press.
- Worden, J. (1982/1991/2002/2009). Grief counselling and grief therapy: A handbook for the mental health practitioner (4 ed.). New York: Springer.
- Zech, E. (2006). Psychologie du deuil: Impact et processus d'adaptation au décès d'un proche.
- Zech, E., Ryckebosch-Dayez, A. S., & Delepiaux, E. (2010). Improving the efficacy of intervention for bereaved individuals: Toward a process-focused psychotherapeutic perspective. *Psychologica Belgica*, 50(1-2), 103-124.

Chapter 2 - Attachment and severity of grief: The mediating role of negative appraisal and inflexible coping

Delepau, E., Ryckebosch-Dayez, A.S., Heeren, A., & Zech, E. (in press). Attachment and severity of grief: the mediating role of negative appraisal and inflexible coping. *Omega: Journal of Death and Dying*.

Abstract

According to the Dual Process Model of coping with bereavement (DPM; Stroebe & Schut, 1999), adjustment to bereavement involves a flexible oscillation between two types of coping strategies: loss-oriented (LO) and restoration-oriented (RO). This model postulates that extremely anxious or avoidant attachment disturbs the oscillation process by focusing more on one type of strategy, either LO or RO. The present study examined this assumption. We recruited 321 bereaved individuals who had lost a romantic partner. Our results showed that less negative appraisal of bereavement-related stressors, as well as higher use of RO strategies, mediated the link between attachment avoidance and low severity of grief reactions. However, the DPM variables were not found to mediate the link between attachment anxiety and elevated grief reactions. We discuss how these results provide an empirical basis of the DPM.

Keywords: grief; bereavement; attachment; appraisal; coping; flexibility

1. Introduction

Grieving the loss of a significant person is one of the most stressful experiences in human life. Although most bereaved individuals finally come to terms with such an experience, a significant minority (i.e., 10-15 %) suffer from a prolonged negative mood and specific grief reactions (Bonanno & Mancini, 2008). Specific grief reactions may become problematic if they extend over a period of time, including increased morbidity and higher risk of mortality (e.g., Prigerson et al., 2009). Such grief reactions include yearning (e.g., craving, pining, or longing for the deceased; physical or emotional suffering), difficulty accepting the loss, difficulty moving on with life (e.g., making new friends, pursuing new interests), feeling that life is unfulfilling, empty, or meaningless since the loss or feeling stunned, dazed or shocked by the loss (for a complete list of prolonged grief criteria, see Prigerson et al., 2009). Given the debilitating nature of these enduring grief reactions, it is crucial to examine the way such reactions are developed and maintained.

During last few decades, attachment theory has been one of the most comprehensive and widely used theoretical framework to understand why some individuals develop severe grief reactions (for a review, see Mikulincer & Shaver, 2008; Stroebe, Schut, & Stroebe, 2005). According to attachment theory, two separate attachment styles -anxious and avoidant- are differentially linked to grief reactions. Individuals with anxious attachment tend to show a lack of trust in oneself, anxiety about separations, abandonments, lack of love and support, extensive emotionality, inability to cope with attachment-related feelings and tendency to be clinging. As such, bereaved individuals with anxious attachment are likely to be very emotional and preoccupied after the loss of a significant other. More specifically, they often experience intense anxiety, anger, and sorrow, yearn inconsolably for the lost partner, fail to accept the loss and have difficulties in establishing a new life structure. This pattern is termed chronic grief. In striking contrast, individuals with avoidant attachment mistrust others, are compulsively independent, avoid deep emotional interdependency, and suppress rather than express (attachment-related) emotions and other signs of need or vulnerability. As such, bereaved individuals with avoidant attachment are likely to avoid overt emotional upset about the loss of a significant other. They will also often use defensive reactions to inhibit anxiety and sadness, downplay the importance of loss, and try to steer clear of thoughts and memories focused on the deceased. This pattern is termed prolonged absence of conscious grieving. Several studies have found a strong relation between the aforementioned attachment styles and adjustment to grief. Quite

consistently, anxiously-attached individuals often develop an overly dependent relationship to the deceased person and experience chronic bereavement-related distress and depression (Field & Sundin, 2001; Fraley & Bonanno, 2004; Wayment & Vierthaler, 2002). However, the results of studies examining avoidantly-attached individuals are less consistent. Some research has shown little or no association between avoidant attachment and grief, depression, or distress (e.g., Field & Sundin, 2001; Wayment & Vierthaler, 2002) while other research has shown a positive association between avoidant attachment and severity of grief (e.g., Wijngaards-de Meij, et al., 2007, Boelen & Klugkist, 2011; Boelen & van den Bout, 2010; van der Houwen, Stroebe, Schut, Stroebe, & van den Bout, 2010b). Finally, while the avoidant attachment has been shown to be associated with somatic symptoms in the research by Wayment and Vierthaler (2002), it has also been associated with resilience over time (Fraley & Bonanno, 2004).

While some aspects of attachment theory remain unclear, researchers have consistently found attachment insecurities to be among the major factors affecting bereavement outcomes. Thus, by using attachment theory, researchers may be able to help identify and support individuals at risk (e.g., Parkes, 2006; Zech & Arnold, 2011; Zech, Ryckebosch-Dayez, & Delespau, 2010). However, to do so, the underlying processes connecting attachment style and poor adjustment need to be better understood. A few researchers have begun to examine these processes. For example, Field and Sundin (2001) showed that poor adjustment due to anxious attachment was mediated by the appraised inability to cope with the loss. In another study, van der Houwen, Stroebe, Schut, Stroebe, and van den Bout (2010b) showed that the detrimental effects of avoidant attachment dimension were mediated by rumination and threatening interpretations of grief reactions (i.e., negative and fearful interpretations of grief reactions that are not necessarily indicative of disturbance). Finally, Boelen and van den Bout (2010), as well as Boelen and Klugkist (2011), recently examined two processes they defined as anxious avoidance (i.e., avoiding stimuli that remind one of the reality of the loss) and depressive avoidance (i.e., avoiding activities that facilitate adjustment). In their study, Boelen and Klugkist (2011) included negative cognitions (which are defined as negative thoughts about one's life) in their mediation analyses. Taken together, results of both studies demonstrated that anxious and depressive avoidance, as well as negative cognitions, mediated the link between anxious and avoidant attachment and severe grief reactions.

In fact, according to *Cognitive Stress Theory* (Folkman, 2001; Lazarus & Folkman, 1984), two core transactional phases are thought to be fundamental when dealing with a stressful

event (i.e., the loss of a significant person). The process starts with a person and his or her beliefs, values, goals, and resources for coping, and a specific event or transition that signals a change or a threatened change in the status of a valued goal. The first phase consists of (1) the appraisal of the valence of the event and (2) the appraisal of the ability to cope with the event. Together, both appraisals affect the particular emotion the person will experience and its intensity (Folkman, 2001). Threatening grief interpretations as well as appraised inability to cope with the loss -two processes investigated in the previously reported studies- could be associated to this first phase. The appraisal process is supposed to shape the way an individual copes with the distressful event. After the individual finishes appraising the valence of the event, the second phase commences which consists of appraising their ability to cope with the event. That is, in what ways will they manage (reduce, master, tolerate) the external or internal demands of the stressful situation. The coping process is likely to change according to person-environment transactions. The change may be a result of extraneous modifications in the environments, the effects of coping efforts directed at changing the environment, or coping efforts directed at altering the meaning of the event. Anxious and depressive avoidance investigated in the studies reported earlier could be associated to this second phase. According to the model, the more maladapted the coping strategies are, the less favorable the adjustment will be.

Yet despite the advances in understanding the mediating factors involved in how individuals cope with grief, no study has investigated appraisal and coping strategies as a global process. The coping strategies investigated in prior research have been based on a cognitive-behavioral conceptualization of complicated grief -which identify potentially dysfunctional processes that could lead to complicated grief (see Boelen, van den Hout & van den Bout, 2006)- but not on a model of coping with bereavement including specific dysfunctional and functional bereavement-related strategies. Thus, a more integrated investigation of both appraisal and coping processes, as well as further exploration about specific bereavement-related coping strategies, is still needed to better understand the processes underlying the relation between insecure attachments and adjustment to grief. The present study fills this lacuna.

2. The present study

To investigate both appraisal and bereavement-related coping processes, we used the *Dual Process Model of Coping with Bereavement* (DPM) (Stroebe & Schut, 1999; 2010). The

DPM states that effective coping strategies need to be adapted to the specific stressors that are encountered during bereavement. Based on previous theorizations and empirical data, this model integrates and extends preexisting but limited bereavement coping models (for a review see Hansson & Stroebe, 2007). In addition and particularly relevant for the present concern, the DPM proposes that specific coping styles are adopted by bereaved individuals according to their degree of attachment insecurity. Consequently, coping strategies are believed to mediate the link between insecure attachments and adjustment to bereavement.

For a more comprehensive explanation of the proposed processes that mediate the relation between attachment insecurity and adjustment to grief, we first describe the coping strategies that lead to maladjustment and then present the processes involved in attachment insecurity and the resulting adjustment pattern. According to the DPM, effective coping with bereavement includes dealing with both loss-oriented (LO) and restoration-oriented (RO) stressors. LO stressors include coping with the loss of the person him/herself (e.g., working through grief, searching for the meaning of the loss, thinking it through). By contrast, RO stressors include coping with secondary stressors that come about as an indirect consequence of the bereavement (e.g., coping with psychosocial changes such as changing identity or role from “wife” to “widow”, dealing with an instrumental transition such as the need to assume new tasks and responsibilities). The specification that there are two categories of bereavement-related stressors may bring about a shifting from demands of a situation to the other focus of attention. Stroebe and Schut (1999) designated this dynamic coping process *oscillation*. Following this principle, the ability to effectively cope with the loss of a significant person implies an ability to remain flexible in dealing with both LO and RO stressors. According to the DPM, deficits in flexible coping processes is assumed to directly contribute to the occurrence of either severe, or absent grief reactions. Thus, on the one hand, according to the DPM, individuals who focus exclusively on LO stressors, avoiding the RO stressors, should experience chronic grief. On the other hand, bereaved individuals who focus exclusively RO stressors, avoiding the LO stressors, should experience little or no sign of grieving.

Interestingly, such deficits should be explained by specific insecure attachments to the deceased person (Stroebe et al., 2005). More specifically, anxiously-attached individuals are known to show extreme dependence on their partners as well as elevated preoccupation with relationship closeness. Thus, they are expected to appraise the loss of their attachment figure in a very negative way and to focus exclusively on LO (e.g., yearning and rumination) as a result of which they are at greater chance to develop severe grief reactions. Extremely

avoidantly-attached individuals, on the other hand, keep safe distance from attachment figures and develop compulsive independence. After the loss of a significant person, they would deny the need for grieving over the loss of an attachment figure, move thoughts related to the loss away and maintain their own ability to cope alone. Accordingly, they are expected to downplay the impact of the loss and focus exclusively on RO as a result of which they would be more prone to show few signs of grieving (i.e., absence of grieving in extreme cases).

To our knowledge, no study has yet examined the relation between insecure attachments and adjustment to grief as function of the specific role played by the appraisal of the loss-related stressors and the ability to oscillate between LO and RO stressors. Thus, the aim of the present study was to investigate the extent to which the appraisal and oscillation process mediates the influence of both anxious and avoidant attachments on grief reactions. In line with attachment theory (Mikulincer & Shaver, 2008) as well as the DPM (Stroebe et al., 2005), we predicted that individuals with higher attachment anxiety would exhibit more negative appraisals of LO and RO stressors, conduct primarily LO coping strategies, and show increased grief reactions. In striking contrast, we expected that individuals with higher attachment avoidance would exhibit lower negative appraisal of LO and RO stressors, conduct primarily RO coping strategies and show lower levels of grief reactions.

3. Method

3.1. Participants

Participants were recruited via announcements on French-speaking online discussion forums related and unrelated to bereavement (e.g., Doctissimo, Vivre son deuil; a detailed list can be provided by the lead author). Recruitment started in April 2009 and took place over a 12-month period. To take part into the study, participants had to meet 2 criteria: (1) be at least 18 years of age and (2) have experienced the death of a romantic partner. The sample consisted of 321 bereaved individuals (285 women), ranging from 17 to 88 years old ($M = 41$, $SD = 14.2$). Participants were predominantly French (75%) and well educated (54% having at least a post-graduate degree). Losses were mostly due to disease (45%) or accident (27%) and time since the death ranged from 6 days to 38 years ($M = 2.84$, $SD = 5.17$). Time since the death was less than 6 months for 1/3 of the

sample, between 6 to 12 months for 1/5, between 12 to 36 month for 1/5 and above 36 months for 1/5. Most of the participants reported having lost a spouse (45%) or a companion (23%) after 3 to 779 months from the start of the relationship. The complete characteristics of the sample are displayed in Table 1.

3.2. Procedure

After a brief description of the study, participants were invited to fill in an online questionnaire. This questionnaire assessed background and loss-related variables, attachment to the deceased partner, grief-related reactions, appraisal of LO and RO stressors as well as oscillation between LO and RO strategies. After completing the questionnaire, participants were thanked for their participation.

3.3. Measures

Background and loss-related variables. Participants were asked about their gender, age, nationality, intimacy with the deceased (“to what extent were you intimate with your romantic partner, i.e., the tendency to usually share emotions, concerns or ideas”; possible responses ranged from 0 (*not intimate*) to 6 (*highly intimate*)), relationship type with the deceased (i.e., husband/wife, companion, common law spouse, boy- or girlfriend, other), the length of their relationship and cohabitation, the date and the cause of the death (i.e., natural, disease, accident, homicide, suicide, other to be specified).

Attachment. A French version of the Experience in Close Relationships (ECR), initially created by Brennan, Clark, and Shaver (1998), was used to assess attachment to a romantic partner and adapted in order to assess the individual’s current perception of their attachment to the deceased partner (see Appendix 1.). Participants rated on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*) the extent to which each item supported how they had been feeling about their romantic relationship before the death. The ECR includes 18 items addressing the anxious dimension of attachment (e.g., *I worried about being abandoned*) and 18 addressing the avoidant dimension of attachment (e.g., *I preferred not to show my partner how I felt deep down*). The reliability and validity of the scales have consistently been demonstrated in previous studies (e.g., Brennan et al., 1998). In the present sample, Cronbach’s alpha coefficients were high for both the anxious dimension ($\alpha = .86$) and the avoidant dimension scales ($\alpha = .88$).

Appraisal. In order to evaluate how individuals appraised grief-related stressors, we created a 10-item questionnaire (see Appendix 2.). Five items tapped LO stressors (e.g., *the death of the loved one; the loss of the bond with the loved one; the absence of the loved one; the emotions related to the loss; being widowed*) and five items tapped RO stressors (e.g., *planning future life; administrative tasks after the death of the loved one; tasks that the bereaved used to contribute to; the future life without the loved one*). Each item rated the extent to which individuals evaluated bereavement-related stressors negatively on a 7-point scale ranging from *not at all negative* (1) to *extremely negative* (7). A unique total LO and RO appraisal score was computed by computing the mean of the 10 items³. The score represented the extent to which bereavement-related stressors were appraised negatively. The scale presented good internal consistency with a relatively high Cronbach's alpha ($\alpha = .84$).

Oscillation between coping strategies. To examine the extent to which individuals oscillated between coping strategies, we created a 24-item grief coping questionnaire (for a complete description of the scale, see authors, in prep/2012) (see Appendix 3.). Items were primarily based on the 22-item Inventory of Daily Widowed Life (IDWL; Caserta & Lund, 2007) but were adapted to avoid certain shortcomings in the original questionnaire (e.g., confusion of some coping items with outcomes). The factor analysis with 2 fixed factors and varimax rotation, revealed that each item loaded on only one of two distinct factors that corresponded either to LO coping strategies (e.g., *trying to understand and accept the death; taking time to think about the loss and the deceased; trying to accept living without the deceased*), or to RO coping strategies (e.g., *trying to imagine life without the deceased; trying to accept being a widow/er; trying to develop a social, as well as an affective, life*). The 24-item questionnaire presented good internal consistency. Cronbach's α was .85 for LO

³ In our analysis, we collapsed the scores for the LO and RO items for a number of reasons. First, LO and RO scores were positively correlated [$r(321) = .58, p < .01$], indicating that both scores varied in the same way, with higher score in LO being associated with higher score in RO appraisal. Another reason to compute a total score of LO and RO was that similar patterns of results were observed for the two kinds of appraisal when correlations were performed with the oscillation score as well as the amount of grief reactions. More specifically, more negative appraisal of LO and RO bereavement stressors were both associated with higher scores on the oscillation measure (i.e., primarily LO strategies), respectively [$r(278) = .48, p < .001$] and [$r(278) = .53, p < .001$] as well as elevated grief reactions, respectively [$r(278) = .61, p < .001$] and [$r(278) = .68, p < .001$]. Finally, an exploratory factor analysis (principal component analysis), suggested a single factor solution. This confirmed the possibility to use one single score.

strategies and .86 for RO strategies. Participants rated on a 5-point scale ranging from 1 (*never: less than once a month*) to 5 (*always: several times a day*) the frequency in which they used the strategy during the past month. A sixth position could be checked for non-applicable situations (e.g., non-existing stressors). Non-applicable situations were recoded as missing values. Participants who presented more than 25% missing values on at least one subscale (either the LO, or the RO subscale) were excluded from the analyses ($n = 21$). The individuals excluded on this basis did not statistically differ from the rest of the sample in terms of age, gender, time elapsed since the death, length of partnership cohabitation, length of the relationship, marital status (spouse vs. girl/boyfriend), number of children or grandchildren, nor level of education. The LO and RO continuous scores were calculated by averaging items on each subscale. Based on Caserta and Lund's (2007) work, an oscillation score was computed by subtracting the total RO score from the total LO score. Hence, the oscillation score ranged from -5 (exclusively RO focus) to +5 (exclusively LO focus). A score around 0 indicated equal use of both LO and RO strategies. Participants with a score lower than 3 on both subscales were excluded ($n = 22$) to distinguish patterns of equilibrium between the two kinds of coping strategies from a pattern of very limited use of both coping strategies. Thus, the final sample for the oscillation measure included 278 participants. The LO strategies, RO strategies, and oscillation scores were normally distributed; skewness and kurtosis measures for each of these distributions had absolute values < 1.10 .

Grief adjustment. A French version of the Inventory of Traumatic Grief (ITG) was used to measure severity of grief symptoms (Prigerson & Jacobs, 2001) (see Appendix 4.). The ITG is a 30-item self-report instrument assessing symptoms of grief severity (also called prolonged grief), as defined by a consensus panel (Prigerson et al., 1999). Levels of symptom severity during the last month were evaluated with five-point Likert scales ranging from 1 (*never*) to 5 (*always*). A continuous score ranging from 30 to 150 was computed by summing the items. The reliability and validity of the scale have been consistently found (e.g., Prigerson & Jacobs, 2001). In the present sample, Cronbach's alpha was high ($\alpha = .94$).

Table 1. *Means, standard deviations and range for background and loss characteristics of the sample as well as mediation model variables (N = 321)*

Background characteristics	
Sex (N (%))	
Men	36 (11.2)
Women	285 (88.8)
Age (in years) (M (SD); minimum – maximum)	41 (14.2); 17-88
Nationality (N (%))	
French	240 (74.8)
Belgian	37 (11.5)
Canadian	27 (8.4)
Other	17 (5.3)
Intimacy (M (SD); minimum – maximum)	5.53 (.8); 1-6
Level of education (N (%))	
Primary school	6 (1.9)
Secondary school	134 (41.8)
University degree / Some post-secondary school	172 (53.6)
Other	9 (2.8)
Status of the deceased person (N (%))	
Spouse (married couple)	143 (44.5)
Companion	75 (23.4)
Common law spouse	60 (18.7)
Boy- or girlfriend	39 (12.1)
Other	4 (1.2)
Length of relationship (in months) (M (SD); minimum – maximum)	161.7 (154.2); 3-779
Length of cohabitation (in months) (M (SD); minimum – maximum)	137.3 (151.3); 0-740
Time since the death (in month) (M (SD); minimum – maximum)	
< 6 months	107 (33.4 %)
>=6 months and <12 months	69 (21.5%)
>=12 months and <36 months	71 (22.1 %)
>=3 years or more	73 (22.7 %)
Cause of death (N (%))	

Natural	17 (5.3)
Disease	143 (44.5)
Accident	86 (26.8)
Homicide	9 (2.8)
Suicide	31 (9.7)
Other	17 (5.3)
Mediation model variables	
Anxious dimension of attachment (M (SD); minimum – maximum)	3.25 (1.14); 1.11 - 6.78
Avoidant dimension of attachment (M (SD); minimum – maximum)	1.99 (.84); 1 - 5.33
Negative appraisal (M (SD); minimum – maximum)	5.12 (1.08); 1.40 - 7
Oscillation score (M (SD); minimum – maximum)	.57 (1.14); -3.34 - 2.93
ITG score (M (SD); minimum – maximum)	98.95 (21.68); 32 - 139

Note. ITG = Inventory of Traumatic Grief (Prigerson et al., 2001) is a measure of prolonged grief severity. M = Mean. SD = Standard deviation.

3.4. Data reduction and normality assumption

Participants who exhibited responses more than 3.29 standard deviations below or above the mean were discarded as outliers (less than .01% of the data). Before performing the analysis, the normality of the data was assessed using the Kolmogorov-Smirnov test. Data for the anxious dimension score, $D(274) = 1.08$, $p = .19$, the appraisal score, $D(274) = 1.30$, $p = .07$, as well as the oscillation score, $D(274) = .67$, $p = .77$, were not significantly different from the normal distribution. However, data for the avoidant dimension score, $D(274) = 2.29$, $p < .01$, and the ITG score, $D(274) = 1.44$, $p < .05$, were significantly different from the normal distribution. Due to positively skewed distributions, we used a logarithmic transformation prior to analysis for these two scores. Means, standard deviations and range of the mediation model variables are displayed in Table 1.

4. Results

4.1. Correlations

Zero-order correlations were computed among the variables. As shown in Table 2, there were significant correlations, ranging from moderate to high, among all variables

except for the anxious dimension variable, which was not significantly associated with negative appraisal and the oscillation variables. More precisely, results showed that the avoidant dimension was negatively correlated with negative appraisal, oscillation, and grief severity. These results suggest that as avoidant dimension scores went up, individuals rated grief-related stressors as less negative and the more frequently individuals used RO strategies, the less severe they rated the symptoms of grief.

It should be noted that when we used a partial correlation controlling for the anxious dimension, all the correlations between avoidant dimension and other variables remained strongly significant. In addition, when using a partial correlation controlling for the avoidant dimension, the anxious dimension and the negative appraisal were all significantly associated, $r(275) = .21, p < .001$, indicating that bereaved individuals showing higher attachment anxiety tended to appraise bereavement-related stressors more negatively. However, even when using a partial correlation controlling for avoidant dimension, the anxious dimension remained unrelated to the oscillation, suggesting that attachment anxiety was not associated with a particular pattern of coping. Finally, all correlations remained significant even after performing partial correlations controlling for the time since the death, suggesting that links between attachment dimensions, negative appraisal, oscillation as well as adjustment to grief were not influenced by the time since the death.

Table 2. *Zero-order correlations for attachment dimensions, mediators, and severity of grief reactions (N= 278)*

	1.	2.	3.	4.
1. Anxious dimension	-			
2. Avoidant dimension	.27**	-		
3. Negative appraisal	.09	-.34**	-	
4. Oscillation	-.01	-.33**	.61**	-
5. ITG	.19**	-.21**	.70**	.61**

Note. Oscillation was calculated by subtracting the total RO score from the total LO score (a highly positive score indicates a primarily use of LO strategies whereas a highly negative score indicates a primarily use of RO strategies); ITG = Inventory of Traumatic Grief (Prigerson et al., 2001) is a measure of *severity of grief reactions*.

** $p < .01$; *** $p < .00$.

4.2. Mediational analyses

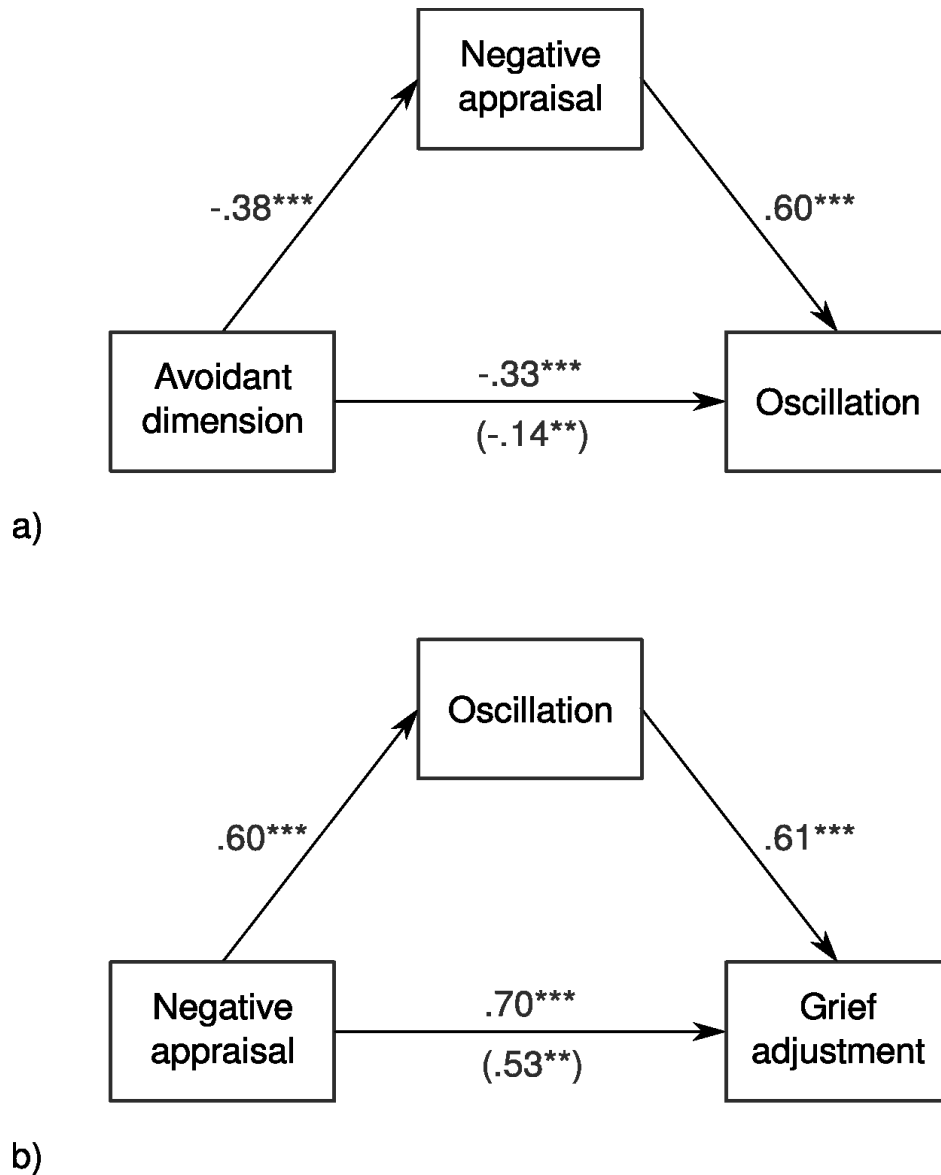
To examine whether both negative appraisal and oscillation mediated the effects of the attachment dimensions on grief adjustment, we performed mediational analyses following the procedure outlined by MacKinnon, Fairchild, and Fritz's (2007). This procedure is a variation of the Sobel (1982) test that accounts for the non-normal distribution of the $\alpha\beta$ path through the construction of asymmetric confidence intervals (MacKinnon et al., 2007). Older approaches of mediational analysis (e.g., Sobel test) have been compromised by their reliance on the erroneous assumption that the product of regression are normally distributed and have been surpassed by the asymmetric distribution of products approach (MacKinnon et al., 2007). Indeed, as observed by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), tests of significance of and confidence limits for indirect effects based on the distribution of products method have more accurate Type I error rates and more power than other commonly used tests. Finally, this procedure tests the product of the coefficients for the effects of (a) the independent variable to the

mediator (α), and (b) the mediator to dependent variable when the independent variable is taken into account (β).

We initially examined whether negative appraisal mediated the effects of attachment dimensions on oscillation. Regarding the anxious attachment dimension, inconsistent with a statistically significant mediation, the 95% confidence interval of the indirect path ($\alpha\beta$ product) contained zero (lower limit = -.003, upper limit = 0.02). Results from the Sobel test supported this conclusion, $Z = 0.13, p = .45$.

With regard to the avoidant attachment dimension, consistent with a significant statistical mediation, the 95 % confidence interval of the indirect $\alpha\beta$ path did not overlap with zero (lower limit = -1.66, upper limit = -.96) and the Sobel test was statistically significant, $Z = 5.20, p < .0001$. As shown in Figure 1a, this finding indicated that the avoidant attachment dimension decreased oscillation through reduced negative appraisal.

Figure 1. (a) Negative appraisal as a mediator of the effects of avoidant attachment dimension on the oscillation score; (b) Oscillation as a mediator of the effects of the negative appraisal on grief adjustment.



Note. Coefficients appearing above lines are β weights for uncorrected paths. Coefficient in parentheses appearing below lines is β weight for corrected path.

** $p < .01$. *** $p < .001$.

We also examined whether the oscillation score mediated the effect of negative appraisal on grief adjustment. Consistent with a statistically significant mediation, the 95% confidence interval of the indirect path ($\alpha\beta$) did not contain zero (lower limit = .01, upper limit = .03). Results from the Sobel test supported this conclusion, $Z = 5.12$, $p < .0001$. As

shown on Figure 1b, this finding suggested that reduced negative appraisal improved grief adjustment through heightened focus on RO.

In order to test the impact of time since the death on the two previous mediational models, mediational analyses were performed separately for 3 different categories of time (i.e., less than 6 months; 6 to 36 months; over than 36 months). Results were consistent with statistically significant mediations across all three time periods, suggesting that the length of time from when their intimate partner died does not affect the associations outlined in the mediational model.

In brief, the present findings suggest that attachment avoidance decreases the oscillation score through reduced negative appraisal of bereavement-related stressors, which then, in turn, leads to improved grief adjustment.

5. Discussion

The main goal of this study was to examine the severity of grief reactions from a transactional perspective. In accordance with this perspective, we hypothesized that the severity of grief reactions would fluctuate as a function of the transactions between the bereaved individuals and their environment. In particular, we hypothesized that such transactions would mediate the relation between how the bereaved individuals felt during their previous relationship to the deceased and the severity of grief reactions after the loss of a romantic partner. Two core transactional/mediational processes were highlighted: the appraisal of the bereavement-related event and the coping strategies used to deal with it.

In accordance with the attachment theory (Bowlby, 1980; Mikulincer & Shaver, 2008; Shaver & Tancredy, 2001; Stroebe et al., 2005), we first tested whether attachment dimensions would be associated with grief adjustment in bereaved romantic partners. In line with our prediction, the anxious dimension was significantly and positively correlated to elevated grief reactions. This is consistent with attachment theory and the *Dual Process Model of Coping with Bereavement* (DPM)'s assumptions about the development of more pronounced grief reactions for anxiously attached individuals (Bowlby, 1980; Mikulincer & Shaver, 2008; Shaver & Tancredy, 2001; Stroebe et al., 2005). Indeed, anxiously attached individuals are more prone to invest heavily in their relationships and develop high dependency on their romantic partners (Mikulincer & Shaver, 2008). Consequently, it is not surprising that losing a highly invested partner would lead to intense grief, failure to accept the loss and trouble in planning new roles and activities without the deceased (Mikulincer

& Shaver, 2008). Also consistent with the hypotheses, attachment avoidance with the deceased partner was associated with less severe grief reactions. These results may suggest that the affective bond to the deceased may have been weaker for more avoidant individuals, leading them to grieve less. The strong negative correlation between specific attachment avoidance and the intimacy to the deceased in the present study ($r(278) = -.58$, $p < .001$) support this suggestion. However, these results contradict recent studies that have shown an association between avoidant attachment and elevated grief severity (e.g., Boelen & Klugkist, 2011; Boelen & van den Bout, 2010; Wijngaards-de Meij, et al., 2007). Such inconsistencies could be explained by Jerga, Shaver, and Wilkinson (2011) study, which has shown that general attachment avoidance (i.e., feelings and behaviors in general close relationships) was associated with higher grief severity while specific attachment avoidance (i.e., feelings and behaviors related to the past relationship with the deceased) was associated with less grief reactions. Consistent with these findings, previous studies which had shown a positive relation between attachment avoidance and grief reactions had used general attachment avoidance measurement, while the present study which has shown the exact opposite results, has used a specific attachment avoidance measurement. According to such differences in the pattern of result, even if both constructs of attachment (i.e., general and specific) are theoretically close, future studies investigating the link between attachment insecurities and adjustment to grief should take into consideration the distinction between general specific attachment avoidance.

For the first time in the bereavement field, we next examined whether the association between attachment dimensions and grief adjustment would be mediated by the appraisal of bereavement-related stressors and the oscillation process between bereavement-related coping strategies. Our results found that the anxious dimension was positively correlated to negative appraisal when controlling for avoidant dimension. These results suggest that higher attachment anxiety is associated to more negative appraisal of bereavement-related stressors. Nevertheless, no link was shown between the anxious dimension and the oscillation process even when controlling for avoidant dimension. Thus, the mediating role of negative appraisal and oscillation processes between anxious dimension of attachment and grief severity was not supported. These unexpected results may have occurred because we defined and operationalized coping strategies as voluntary and controlled processes (e.g., “I take time to think about the deceased person”) (cfr. DPM; Stroebe & Schut, 2010). Yet, previous research has shown that the anxious dimension was associated with a lack of control in emotional processing. For example,

Mikulincer and Orbach (1995) found that anxiously-attached individuals had quickest access to targeted painful memories and showed these memories to spread like wildfire throughout their cognitive system. In line with these results, it is possible that processing tendencies of individuals with a high score of attachment anxiety hamper or deregulate effective coping strategies (e.g., calm exploration of the meaning of the death without being overwhelmed by intrusive and uncontrolled distressing thoughts). This would suggest that bereaved individuals with high anxiety may be less inclined to develop primarily LO coping strategies than passive intrusion of grief or dysfunctional preoccupation with the deceased, which could in turn explain the absence of an association between the anxious dimension and a specific type of bereavement-related coping strategy. It is worth adding that anxiously-attached individuals have been theoretically linked with rumination, a passive process of repetitive thoughts and preoccupation focused on the loss and the deceased (Stroebe et al., 2005). Interestingly, rumination has been strongly associated with maladjustment to grief (for a review, see Stroebe et al., 2007). Thus, future research should examine whether the relation between the anxious dimension of attachment and severe grief reactions would be mediated by uncontrolled and overwhelming processes such as rumination as opposed to controlled coping strategies.

In terms of the avoidant dimension, our results showed that the relation between avoidant dimension and grief reactions was mediated by a reduced negative appraisal of LO and RO stressors as well as a reduced oscillation score, indicating an inclination for the use of RO coping strategies rather than LO strategies. These results remained significant even when controlling for time since the death of their partner. This suggests that the appraisals of bereavement-related stressors, as well as the coping strategies used to deal with such an event, remained important mediational processes of the relation between attachment avoidance and grief reactions whether the bereaved individual had experienced the death more or less recently. However, it is worth noting that these results do not disconfirm the postulation that coping strategies evolve across time (Caserta & Lund, 2007; Stroebe, Schut, & Stroebe, 2005; see authors, in prep/2012). Rather, they simply suggest that both processes remain relevant across time when examining variations in grief reactions.

These results support our hypotheses. Moreover, the fact that the mediational models remained significant at different periods of time as well as beyond the acute months of grieving is in line with the *Cognitive Stress Theory* (Lazarus & Folkman, 1984). Indeed, this model focuses less on the characteristics of the event (e.g., the time since the loss) than on

the transactional processes of appraisal and coping strategies to explain adjustment (i.e., grief severity). The results also converge with previous research that demonstrated an association between attachment avoidance and anxious avoidance, defined as the tendency to keep attention away from the reality of the loss (e.g., “I avoid the place where {XXX} died”) (Boelen & Klugkist, 2011; Boelen & van den Bout, 2010). Indeed, such coping strategies could be negatively linked to the LO strategies which in turn could be associated to reduced oscillation score (i.e., less involvement in LO strategies than RO ones). However, in these previous studies, attachment avoidance was also shown to be associated to depressive avoidance, defined as avoidance of activities that could facilitate adjustment (Boelen & Klugkist, 2011; Boelen & van den Bout, 2010). Such strategies could be negatively associated to RO strategies as those are characterized by activities that facilitate adjustment (e.g., doing new things, attending to life changes). Further studies are needed to clarify these conflicting results.

The present results also support the results from Caserta and Lund (2007)’s study in which an unbalanced oscillation, focused primarily on RO strategies, was associated with the most favorable bereavement outcome (including lower severity of grief reactions as well as scores of depression and loneliness). At a first sight, the fact that emphasis on RO is associated with a better adjustment than a more balanced position would appear to contradict the DPM-related hypotheses. However, the results of the present study need to be cautiously interpreted. First, data collection was cross-sectional which impedes any causal conclusions. Second, marked reduction of grief reactions on the ITG measure - which taps the intensity of a large panel of grief reactions - could be associated either to patterns of resilience, which consists of favorable bereavement outcome, or to those of inhibited grief, theorized in the bereavement literature as a complicated type of grief (e.g., Bowlby, 1980). Less severe grief reactions may also be associated with less need in grieving according to the former suggestion about the avoidant dimension being linked with less strong bonding to the deceased which in turn could lead to less need in grieving. Thus, other kinds of outcomes measurement such as psychological well-being or posttraumatic growth should be included in future studies to distinguish these three patterns of adjustment. Assessment of somatization should be also included as inhibited grief has been linked with high levels of less conscious reactions such as somatic symptoms (e.g., Wayment & Vierthaler, 2002). Third, the current operationalization of oscillation was limited. Indeed, using a self-reported questionnaire as well as subtracting one total coping score from another one is a rather crude way to measure the complex process of emotion

regulation that takes place in bereavement. This limitation is further discussed below. Finally, it is worth noting that even if RO strategies are associated with better adjustment, the pattern observed in the present study was rather more an equilibrium with higher RO than LO strategies than an exclusive focus on RO strategies. Indeed, in the present study, such a pattern has not been observed (as the oscillation score is calculated by the subtraction of the RO scores from the LO scores, exclusive use of RO strategies should correspond to an oscillation score equal to -5, that was not present in our study). Accordingly, even if results showed higher RO to be associated with better adjustment, it does not contradict the DPM assumption which states that exclusive focus on RO strategies and avoidance of LO strategies should lead to inhibited grief (Stroebe & Schut, 1999). Future studies should examine whether exclusive focus on RO strategies would be associated with maladjustment.

In the present study, some limitations deserve consideration. First, whereas mediation assumes the direction of causality, our cross-sectional data does not permit us to draw conclusions about temporal precedence. Future studies should use a longitudinal design in order to better understand the causal associations involved in the development and the maintenance of severe grief reactions. Second, negative appraisal and deficits in oscillation process have been evaluated with questionnaires created for the present study. Whereas both measures presented good internal validity, further examination of the validity is still needed (see authors, in prep/2012). For example, future research should investigate whether bereavement-related appraisals have to be understood as belonging to a single factor (as it was preliminary done in the present study) rather than a composite factor. Moreover, the measure of oscillation by subtracting the RO score from the LO score did not allow for a proper distinction between oscillation or failing to use either strategy. The removal of participants with scores less than 3 on both dimensions (7% of the sample) then prevented from the investigation of potential dysfunctional processes. Indeed, scores less than 3 on both dimensions could be assimilated to avoidance of both LO and RO strategies. Yet, as explained earlier, avoidance of both LO and RO strategies could be theoretically associated to anxious avoidance and depressive avoidance respectively, two processes which were previously shown to be linked to more severe grief. Further investigation of such patterns of coping -not yet precisely formulated in the DMP- should be investigated in future studies. Finally, the method of subtraction initially conceptualized to capture a lack of oscillation does not allow us to capture disturbances in the oscillation process (defined as a staccato fluctuation of sometimes involuntary intrusion and

avoidance), another pattern of coping associated in the DPM to maladjustment (i.e., traumatic grief). To examine this alternative detrimental pattern of coping, methods other than questionnaires should be used (see Caserta & Lund, 2007; Stroebe & Schut, 2010). For example, future studies could induce shifts between RO and LO strategies with laboratory techniques for a better evaluation of potential deficit (lack or disturbance) in the oscillation process (Stroebe & Schut, 2010).

To sum up, the present study represents an important contribution to the empirical basis of an influential but not fully empirically substantiated model in the area of grief and bereavement. Since studies directly testing hypotheses derived from the DPM are rare, the present study is the first to examine the combination of general stress-coping variables (appraisal) and specific DMP variables (oscillation between coping pattern of strategies) mediating the relation between attachment dimensions and level of grief reactions. By investigating the relevant variables leading to severe grief reactions, it makes it possible to identify processes that cause or maintain the difficulties encountered by bereaved individuals and then to provide them with help that is specifically adapted to these processes (Zech et al., 2010). Consistent with this line of reasoning, findings of the present study showed that negative appraisal and oscillation processes mediated the link between attachment avoidance and low grief reactions. However, future studies are needed to confirm whether low grief reactions represent a pattern of resilience rather than an absence of grief, another form of grief maladjustment. Finally, the variables mediating the anxious dimension and strong grief reactions appear less clear. Although, the anxious dimension was shown to be associated with more negative appraisal of bereavement-related stressors, no relation was observed between the anxious dimension and the oscillation score. Because attachment anxiety represents a factor that leads to a higher risk of prolonged grief reactions, future studies should investigate more precisely the potential moderating/mediating processes that may underlie this deleterious association.

6. References

- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford.
- Boelen, P. A., & Klugkist, I. (2011). Cognitive behavioral variables mediate the associations of neuroticism and attachment insecurity with prolonged grief disorder severity. *Anxiety, Stress & Coping: An International Journal*, 24(3), 291-307. doi: 10.1080/10615806.2010.527335
- Boelen, P.A., & van den Bout, J. (2010). Anxious and depressive avoidance and symptoms of prolonged grief, depression, and posttraumatic stress-disorder. *Psychologica Belgica*, 50, 49-67. doi: 10.1371/journal.pmed.1000121
- Boelen, P. A., van den Hout, M. A., & van den Bout, J. (2006). A cognitive-behavioral conceptualization of complicated grief. *Clinical Psychology: Science and Practice*, 13(2), 109-128. doi: 10.1111/j.1468-2850.2006.00013.x
- Boerner, K., Wortman, C. B., & Bonanno, G. A. (2005). Resilient or at risk? A 4-year study of older adults who initially showed high or low distress following conjugal loss. *Journal of Gerontology: Series B: Psychological Sciences and Social Sciences*, 60B(2), P67-P73.
- Bonanno, G. A., Lehman, D. R., Tweed, R. G., Haring, M., Wortman, C. B., Sonnega, J., . . . Nesse, R. M. (2002). Resilience to loss and chronic grief: A prospective study from preloss to 18-months postloss. *Journal of Personality and Social Psychology*, 83(5), 1150-1164. doi: 10.1037//0022-3514.83.5.1150
- Bonanno, G. A., & Mancini, A. D. (2008). The human capacity to thrive in the face of potential trauma. *Pediatrics*, 121, 369-375. doi: 10.1542/peds.2007-1648
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss: Sadness and depression*. New York: Basic Books.
- Caserta, M. S., & Lund, D. A. (2007). Toward the development of an Inventory of Daily Widowed Life (IDWL): Guided by the dual process model of coping with bereavement. *Death Studies*, 31(6), 505-534.
- Davila, J., & Cobb, R. J. (2004). Predictors of change in attachment security during adulthood. In J. A. Simpson & W. S. Rholes (Eds.), *Adult attachment: theory, research, and clinical implications* (pp. 133–156). New York: Guilford Press
- Field, N. P., & Filanosky, C. (2010). Continuing bonds, risk factors for complicated grief, and adjustment to bereavement. *Death Studies*, 34(1), 1-29.

- Field, N. P., & Sundin, E. C. (2001). Attachment style in adjustment to conjugal bereavement. *Journal of Social and Personal Relationships*, 18(3), 347-361.
- Fraley, R. C., & Bonanno, G. A. (2004). Attachment and loss: A test of three competing models on the association between attachment-related avoidance and adaptation to bereavement. *Personality and Social Psychology Bulletin*, 30(7), 878-890.
- Folkman, S. (2001). Revised coping theory and the process of bereavement. In M. S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 563-584). Washington, DC, US: American Psychological Association.
- Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer.
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, 58, 593-614.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7(1), 83-104.
- Mancini, A. D., Robinaugh, D., Shear, M. K., & Bonanno, G. A. (2009). Does attachment avoidance help people cope with loss? The moderating effects of relationship quality. *Journal of Clinical Psychology*, 65, 1127-1136. doi: 10.1002/jclp.20601
- Mikulincer, M., & Orbach, I. (1995). Attachment styles and repressive defensiveness: The accessibility and architecture of affective memories. *Journal of Personality and Social Psychology*, 68(5), 917-925.
- Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioral system in adulthood: Activation, psychodynamics, and interpersonal processes. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 35, pp. 53-152). New York: Academic Press.
- Mikulincer, M., & Shaver, P. R. (2008). An attachment perspective on bereavement. In M. S. Stroebe, R. O. Hansson, H. Schut, & W. Stroebe, (Eds.), *Handbook of bereavement research and practice: Advances in theory and intervention* (pp. 87-112). Washington, DC: American Psychological Association.
- Hansson, R. O., & Stroebe, M. S. (2007). Coping with bereavement. In R. O. Hansson and M. S. Stroebe (Eds.), *Bereavement in late life: Coping, adaptation, and developmental influences* (pp. 25-40). Washington, DC: American Psychological Association

- Jerga, A. M., Shaver, P. R., & Wilkinson, R. B. (2011). Attachment insecurities and identification of at-risk individuals following the death of a loved one. *Journal of Social and Personal Relationships*, 28(7), 891-914. doi: 10.1177/0265407510397987
- Parkes, C. M. (2006). *Love and loss: The roots of grief and its complications*. New York: Routledge.
- Prigerson, H. G., Horowitz, M. J., Jacobs, S. C., Parkes, C. M., Aslan, M., Goodkin, K., . . . Maciejewski, P.K. (2009). Prolonged grief disorder: Psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Medicine*, 6(8).. doi: 10.1371/journal.pmed.1000121
- Prigerson, H. O., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: A rationale, consensus criteria, and a preliminary empirical test. In M. S. Stroebe, R. O. Hansson, W. Stroebe, & H. Schut, M. (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 613-645). Washington, DC: American Psychological Association
- Shaver, P. R., & Tancredy, C. M. (2001). Emotion, attachment, and bereavement: A conceptual commentary. In M. S. Stroebe, R. O. Hansson, W. Stroebe, & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 63–88). Washington, DC: American Psychological Association.
- Stroebe, M., Boelen, P. A., van den Hout, M., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance: a reinterpretation of its function in adjustment to bereavement. *European Archives of Psychiatry and Clinical Neuroscience*, 257(8), 462-472. doi: 10.1007/s00406-007-0746-y
- Stroebe, M. S., & Schut, H. (1999). The dual process model of coping with bereavement: rationale and description. *Death Studies*, 23, 197-224.
- Stroebe, M., & Schut, H. (2010). The dual process model of coping with bereavement: A decade on. *Omega: Journal of Death and Dying*, 61(4), 273-289. doi: 10.2190/OM.61.4.b
- Stroebe, M. S., Schut, H., & Stroebe, W. (2005). Attachment in coping with bereavement: A theoretical integration. *Review of General Psychology*, 9, 48-66. doi: 10.1037/1089-2680.9.1.48
- Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290-312). San Francisco, Jossey-Bass.
- Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage & the Family*, 38(1), 15-28.

- van der Houwen, K., Stroebe, M. S., Schut, H., Stroebe, W., & van den Bout, J. (2010a). Online mutual support in bereavement: An empirical examination. *Computers in Human Behavior*, 26(6), 1519-1525. doi: 10.1016/j.chb.2010.05.019
- van der Houwen, K., Stroebe, M. S., Schut, H., Stroebe, W., & van den Bout, J. (2010b). Mediating processes in bereavement: The role of rumination, threatening grief interpretations, and deliberate grief avoidance. *Social Science & Medicine*, 71(9), 1669-1676. doi: 10.1016/j.socscimed.2010.06.047
- Wayment, H. A., & Vierthaler, J. (2002). Attachment style and bereavement reaction. *Journal of Loss and Trauma*, 7, 129–149. doi: 10.1080/153250202753472291
- Wijngaards-de Meij, L., Stroebe, M., Schut, H., Stroebe, W., van den Bout, J., van der Heijden, P., & Dijkstra, I. (2007). Neuroticism and attachment insecurity as predictors of bereavement outcome. *Journal of Research in Personality*, 41(2), 498-505. doi: 10.1016/j.jrp.2006.06.001
- Zech, E., Ryckebosch-Dayez, A. S., & Delespaulx, E. (2010). Improving the efficacy of intervention for bereaved individuals: Toward a process-focused psychotherapeutic perspective. *Psychologica Belgica*, 50(1-2), 103-124.
- Zech, E., & Arnold, C. (2011). Attachment and coping with bereavement: Implications for therapeutic interventions with the insecurely attached. In R. A. Neimeyer, D. L. Harris, H. R. Winokuer, & G. F. Thornton (Eds.). *Grief and bereavement in contemporary society: Bridging research and practice* (pp. 23-35). New York: Routledge.
- Zech, E., Ryckebosch-Dayez, A.-S., & Delespaulx, E. (2010). Improving the efficacy of intervention for bereaved individuals: Toward a Process-Focused Psychotherapeutic Perspective. *Psychologica Belgica*, 50(1-2), 103-124.

Chapter 3 - Why do bereaved partners
experience interfering rumination?
Evidence for deficits in cognitive
inhibition⁴

⁴ Under revision for Death Studies

Abstract

Recurring rumination is strongly associated with grief reactions severity. In this study, we examined whether deficits in cognitive inhibition were related to such a dysfunctional process. Inhibition was investigated among low and high bereaved ruminators in a negative affective priming task with grief-related, negative and positive words. Results revealed impaired inhibition for grief-related information in comparison with negative and positive information in bereaved individuals with elevated rumination. However, when accounting for differences in grief reactions, results indicated that variations in inhibition performances were linked to both rumination and grief reactions. Implications for future research and clinical perspectives are discussed.

Keywords: bereavement, rumination, inhibition deficit, emotion regulation

1. Introduction

Whereas most bereaved individuals come to terms with the loss of a significant person, there is increasing evidence that at least 10-15 % of them remain stuck in prolonged and dysfunctional distress (Prigerson et al., 2009; Stroebe, Schut, & Stroebe, 2007). Such a distressful state has been characterized by disabling painful yearning, desperate loneliness, numbness and difficulties moving on with life (Prigerson et al., 2009). In addition, this kind of intense and perseverative grieving is known to be associated with increased morbidity and mortality (for a review, see Prigerson et al., 2009).

Given the debilitating nature of long-lasting grief severity, it seems crucial to better understand the potential factors that contribute to its development and maintenance. One factor that has been strongly associated with grief severity is rumination, a mental process characterized by repetitive and persistent thoughts about negative emotions and the possible causes and implications of symptoms of distress (for a review, see M.S. Stroebe et al., 2007). More precisely, several researchers have found a negative prospective association between rumination and grief reactions. For example, Bonanno, Papa, Lalande, Zhang, and Noll (2005) revealed that initial rumination at 4 months of bereavement was predictive of poor adjustment 14 months later. Consistent with this result, van der Houwen, Stroebe, Schut, Stroebe, and van den Bout (2010) found that rumination at three points in time played an important role in mediating the impact of several risk factors (e.g., gender, social support, avoidant attachment, neuroticism) on grief reactions. Finally, Morina (2011) also showed that rumination was predictive of prolonged grief symptom severity.

Despite growing evidence indicating that mental rumination is a strong predictor of enduring grief-related distress, to our knowledge, only a few studies have investigated the potential mechanisms that underlie the development and maintenance of rumination. In an initial study, Davis and Nolen-Hoeksema (2000) have examined the performance of students ruminators and nonruminators when addressing a Wisconsin Card Sorting test (WCTS; Grant & Berg, 1948), a measure of adroitness at adapting cognitive set to changing environmental contingencies. Results showed that rumination was significantly associated with cognitive inflexibility and trouble in inhibiting perseveration tendencies. According to Davis and Nolen-Hoeksema, these results suggested that if people cannot inhibit perseverative tendencies and adapt cognitive set to changes in the environment, they may become “mentally stuck” or “trapped” in preoccupation with negative moods and events. Consequently, a ruminative response style could be related to deficits in the inhibition of

information that is no longer relevant according to changes in environmental contingencies.

In fact, several researchers have suggested that deficits in cognitive inhibition might play a fundamental role in the occurrence of rumination (for a review, see Joormann, 2010). Indeed, cognitive inhibition is supposed to be responsible for two crucial processes required for the efficient manipulation of information into working memory (WM). The first consists of the access limitation of irrelevant information into WM and the second of the rejection or updating of information that is no longer relevant in WM (Hasher, Zacks, & May, 1999). Consequently, deficits in inhibitory processes should allow intrusive thoughts to enter WM as well as preclude no-longer relevant thoughts from being deactivated. The resulting inability to control the contents in WM should prevent the maintenance of a coherent stream of thoughts and favor the appearance of unintended recurring thoughts that characterize rumination (Joormann, 2010).

Results from three consecutive studies supported the assumption that rumination would be due to a deficit in cognitive inhibition. In a first study, Joormann (2006) investigated rumination in relation with inhibitory processes that were assessed with a negative affective priming task (NAP). NAP is a measure of access limitation of irrelevant emotional information into WM. The results of this study showed that high ruminators exhibited a reduced ability to inhibit the processing of positive as well as negative words compared to low ruminators, suggesting that rumination was related to difficulties keeping irrelevant emotional information from entering WM. This finding remained significant even when individual differences in dysphoria were statistically controlled for, suggesting that, irrespective of differences in depressive symptomatology, inhibitory dysfunctions and rumination were closely related. In another study, Joormann and Gotlib (2008) investigated rumination in relation to inhibitory processes that were assessed with a modified Sternberg task (Oberauer, 2001), a measure of WM updating from emotional material that is no longer relevant. Results showed that rumination was highly correlated with difficulties in inhibiting the processing of negative material in comparison to positive material, suggesting that rumination was related to difficulties removing irrelevant negative material from WM. Finally, using a NAP task, Joormann and Gotlib (2010) found that rumination within a group of depressed participants was associated with reduced inhibition of negative material in comparison to positive material.

While these recent studies provided an important first step toward the investigation of the association between rumination and impairment in inhibitory processing, existing

findings remain limited. Indeed, only rumination in relation with the processing of emotionally neutral information (Davis & Nolen-Hoeksema, 2000) within a depressed population (Joormann, 2006; Joormann & Gotlib, 2008, 2010) were investigated. Yet, it has been shown that major depression and severe grief reactions load on separate factors (e.g., Boelen & Van Den Bout, 2005). Accordingly, even if symptoms can overlap (e.g., sadness, crying, sleep disturbance, suicidal ideation), there is strong evidence that symptoms of depression are distinct from specific grief reactions (for a review, see Shear et al., 2011). As a result, investigation of the cognitive processes that are associated with rumination in a specific bereaved population is still needed.

In the present study, considering the fact that rumination has been described as a transdiagnostic process that is a dysfunctional style of recycling thought rather than just a specific (negative) content (Nolen-Hoeksema, 1991; Nolen-Hoeksema & Watkins, 2011; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), underlying processes previously linked to neutral or depressed-related rumination -namely inhibition deficits- were expected to be similar in a bereaved population. Accordingly, the main goal of the present study was to investigate the rumination process after the loss of a significant person and this, in association with the potential impairment in inhibitory cognitive functioning.

In line with the previously reported studies (Joormann, 2006; Joormann & Gotlib, 2010), inhibitory deficits in the present study were assessed using a NAP paradigm. Indeed, experimental NAP designs have been used over the past 10 years to test inhibitory functioning of affective material and to assess emerging individual differences (e.g., Joormann, 2004). Specifically, NAP designs allow the assessment of the extent to which access of irrelevant emotional information into WM can be controlled for and subsequently limited in WM. In this task, participants are instructed to respond to a target while ignoring a simultaneously presented distractor in consecutive pairs of trials (a prime and a test trial). In the negative priming condition, distractors presented in the prime trial (prime-trial distractor) and targets presented in the test trial (test-trial target) are related by shared emotional valence. In the control condition, the prime-trial distractor and the test-trial target are unrelated. According to Tipper (1985) as well as Neill, Valdes, and Terry (1995), because the inhibition of the (valence of the) prime-trial distractor remains activated, the response to a same-valence target in the test trial should be delayed. As a result, the negative priming effect is characterized as a delayed response latency when the target in a current trial was instructed to be ignored in a previous trial. The longer the delay was in the priming condition compared to the control condition, the stronger the inhibition was.

To sum up, the aim of the present study was to investigate rumination, a mental process previously shown to promote the development and the maintenance of severe grief reactions. We first expected that mental rumination and grief reactions would be highly associated. Given that elevated rumination has recently been found to be associated with deficits in inhibitory processes, we next hypothesized that bereaved individuals who tend to ruminate in their daily live (high ruminators) would be less able to control or inhibit emotional (grief-related) information that enter into their WM in comparison to bereaved individuals who present few rumination (low ruminators). In contrast with previous studies which have found that rumination typically involve enhanced access of negative material in WM (e.g., depressed participants with elevated rumination presented reduced inhibition for negative material in contrast with positive material) (Joormann & Gotlib, 2008, 2010), we did not expected a general inhibition deficit for negative information but rather a more specific inhibition deficit for grief-related information. Accordingly, we postulated a difference in the cognitive processing of grief-related vs. negative and positive information between low and high bereaved ruminators.

Finally, given that elevated rumination was shown to be directly linked to inhibitory deficits irrespective of the difference in level of depression (e.g., Davis & Nolen-Hoeksema, 2000; Joormann, 2006), we predicted that inhibitory deficits would be associated with a tendency to ruminate irrespective of differences in current grief reactions.

2. Method

2.1. Participants

One hundred ninety one individuals who had lost a romantic partner since 6 to 27 months were contacted to participate to the study. All were recruited via obituary columns of regional daily newspaper and internet sites. In total, 61 bereaved people (20 men, 41 women) accepted to take part to the study. Ninety-two percent of them had lost a spouse whereas 8% had lost a companion. Different causes of death were reported but most of the deceased person had died from disease, $N = 46$ (75.4 %); $N = 6$ (9.8 %) by accident, $N = 4$ (6.6 %) by suicide; $N = 1$ (1.6 %) by natural cause; $N = 4$ (6.6 %) by other types of causes. None of them presented a critical score on the Mini Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) which served as a test for severe cognitive impairment, nor a drugs or alcohol abuse (within the 6 past months), nor had participated

in any previous attentional training which could have improved their cognitive functions. All were French-speaking Belgian citizen.

In order to identify the cognitive processes associated with quite distinct levels of rumination, the first and the last quartiles on the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991; Treynor, Gonzalez, & Nolen-Hoeksema, 2003) were used to define two groups of participants differing in their tendency to experience mental rumination (low ruminators and high ruminators respectively). In this sample, the centile 25 was 33.5 and the centile 75 was 49.5 ($M = 42.31$, $SD = 11.29$). Table 1 presents the sample characteristics of the two groups. There was no significant difference between groups in percentage of female, time since the death, or intimacy to the deceased person. However, participants in the low rumination group were significantly older than participants in the high rumination group. Considering the relationship between age and reaction times in NAP experiments (older individuals present fewer abilities in inhibition) (Fournet, Mosca, & Moreaud, 2007), this variable was added as a covariate in all analyses to exclude potential confounds related to age (Hasher, Stoltzfus, Zacks, & Rypma, 1991). Also, as expected, significant differences between the rumination groups were found in severity of grief symptoms.

Table 1 *Participants characteristics*

	RRS low	RRS high	Test
N female/N	7/12	11/14	χ^2 -Test, n.s.
Age (SD)	61.50 (8.86)	50.64 (7.21)	$t(24) = 3.44^{**}$
Time since the death (in months) (SD)	14.47 (5.40)	11.72 (4.11)	t test, n.s.
Length of relationship (in year) (SD)	37.50 (8.39)	28.43 (9.77)	$t(24) = 2.51^*$
Intimacy	5.50 (1.00)	5.29 (1.07)	t test, n.s.
ITG	54.33 (13.34)	100.57 (15.88)	$t(24) = -7.96^{***}$

Note. RRS = Ruminative Response Scale of the Response Style Questionnaire; ITG = Inventory of Traumatic Grief.

* $p < .05$. ** $p < .01$. *** $p < .001$.

2.2. Instruments and materials

Background and loss-related variables. Participants were asked about their gender, age, nationality, intimacy with the deceased person (ranging from 0 to 6 (*no intimacy* - *high intimacy*)), romantic relationship type with the deceased (i.e., husband/wife, companion), the length of relationship and cohabitation, the date and the cause of the death (i.e., natural, disease, accident, homicide, suicide, other to be specified).

Rumination. A French version of the Ruminative Response Scale of the Response Style Questionnaire (RRS; French version by Douilliez & Philippot, 2010; Nolen-Hoeksema & Morrow, 1991; Treynor et al., 2003) was used to assess how participants generally respond when they feel down, sad, or depressed (see Appendix 5.). The RRS includes 22 items that tap the frequency of thoughts in response to negative moods that are focused on the self (e.g., “think about all your shortcomings, failings, faults, mistakes”), symptoms (e.g., “think about how hard it is to concentrate”), or on possible consequences and causes of moods (e.g., “analyze recent events to try to understand why you are depressed”), rated on 4-point scales (*almost never* - *almost always*). A continuous score ranging from 22 to 88 was calculated by summing items. Previous studies have shown good test–retest reliability (Nolen-Hoeksema, Parker, & Larson, 1994) and acceptable convergent and predictive validity (Treynor et al., 2003). In the present sample, the Cronbach’s alpha was high ($\alpha = .91$).

Grief adjustment. A French version of the Inventory of Traumatic Grief (ITG; Prigerson & Jacobs, 2001) was used to measure severity of grief symptoms (see Appendix 4.). ITG is a 30-item self-report instrument assessing symptoms of prolonged grief (also called complicated or traumatic grief). Questions cover separation distress (Criterion A) and traumatic distress (Criterion B) symptom clusters. Levels of symptom severity during the last month are tapped with five-point scales ranging from 1 (*never*) to 5 (*always*). A continuous score ranging from 30 to 150 was computed by summing the items. The reliability and validity of the scale have been demonstrated (Prigerson & Jacobs, 2001). In the present sample, Cronbach’s alpha was high ($\alpha = .95$).

Cognitive functioning. A French version of the Mini Mental State Examination (MMSE; Folstein et al., 1975) was used to control for the presence of cognitive impairment that could contribute for variations in reaction times. The MMSE is a reliable screening

tool containing 30 questions that are used to test basic cognitive functions such as attention, language production, orientation, language comprehension, and immediate memory (e.g., participants are asked to designate routines objects, to repeat words and expressions, to write a sentence or to perform mental subtractions). Each question is dummy coded (0 = *Wrong answer*, 1 = *Good answer*). People with normal cognitive functioning usually score high on the measurement, ranging from 27 to 30 in total scoring.

Stimuli. Two lists of 80 words were created, each made of 2 categories of words (see Appendix 8, 9 and 10). The first list was made of 40 grief-related and 40 positive words. The second list was made of 40 positive and 40 negative words. The 40 grief-related words were selected from a list of 147 grief-related words (Franck, 2009). In Franck's study, clinicians and scientists specialized in the grief field were consulted to generate a list of grief-related words. The extent to which each word was related to grief was rated by 121 students on a 11 point-scale ranging from -5 (*no grief-related*) to +5 (*grief-related*). Only the 40 words scoring above a mean-value of +2 were selected for the present study. The other 40 positive words were selected from Syssau and Font (2005)'s norm. This norm contains 604 words that were selected from two already published French emotional norms, including 348 concrete words (Alario & Ferrand, 1998) and 256 abstract words (Ferrand, 2001). The word emotional categorization was established from a valence evaluation constituted of a 3-modality scale (negative, neutral, and positive) and from a valence combined with intensity evaluation. Positive and negative words of the second list were also selected from Syssau and Font (2005)'s norms. Neither the first (grief-related and positive words), nor the second list (positive and negative words) did differ on the average word length.

2.3. Procedure

Participants were run individually at the university laboratory. Testing was conducted by and split up into three different master's level clinical psychologists previously trained to enhanced reliability and consistency between them. Participants were asked to sign the informed consent after being informed about the study process. After completion of the RRS and the ITG questionnaires, they were asked to perform the NAP task. Then they were asked to respond the MMSE. The NAP task was administered on a 15-inch desktop computer screen using E-Prime software. Participants were instructed that, after presentation of a fixation cross, two words were simultaneously going to appear: one in the upper and the other in the lower half of the computer screen. For each pair of words, they were asked to pay attention to the word displayed in black letters on a white field and to

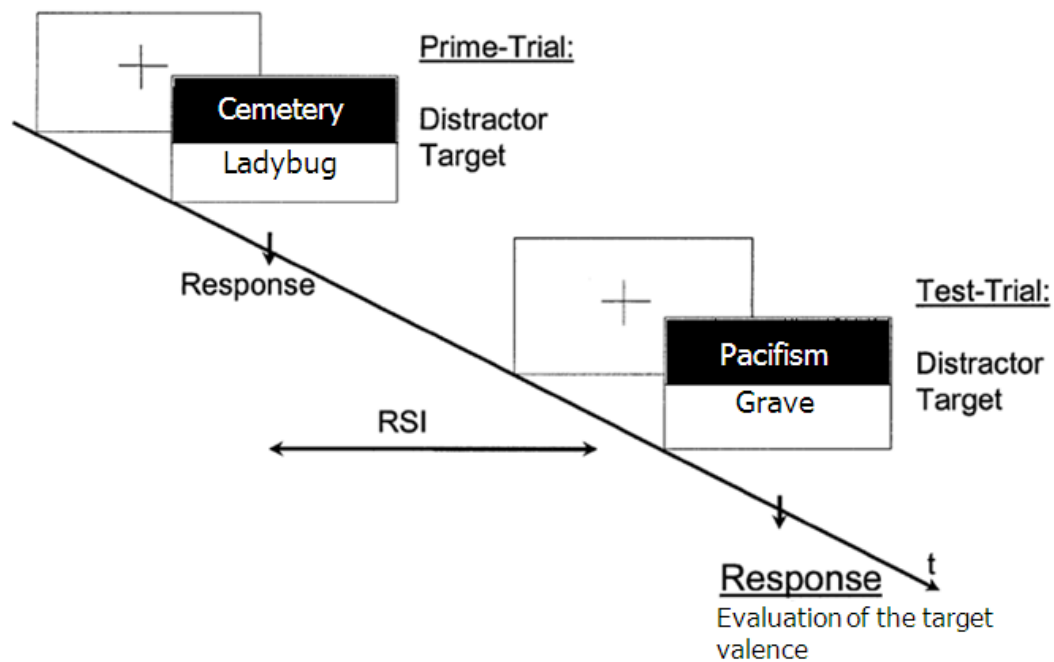
ignore the word displayed in white letters on a black field. Participants were instructed to assess the valence (positive or negative) of the target word (the target word was in dark letters on a white field and the distractor word that was in white letters on a dark field and) by pressing an assigned key on the computer keyboard as quickly and as accurately as possible.

Consistently with the standard negative affective priming design (e.g., Joormann, 2004), each trial consisted of a prime and a test trial and proceeded as follows (see Figure 1). At the beginning of each trial, a fixation cross was presented for 500 ms. Immediately following the disappearance of the fixation cross, the prime-trial was presented on the computer screen until the participant responded. The letters were 1.5 cm in size, there was a gap of 2 cm between the words and the spatial position of the target and distractor words was randomly assigned from trial to trial. Following the response to the prime trial, the fixation cross was again presented for 500 ms. Subsequently, the next trial (i.e., test-trial) was shown. Again, two words were presented and participants were asked to respond to the word presented in dark letters on white ground and to ignore the word presented in white letters on dark ground. Either the test-trial target was related to the prime-trial distractor (negative priming condition), or test-trial target and prime-trial distractor were unrelated (control condition). Importantly, participants cannot distinguish between prime and test trials. The separation into these trials is introduced at the time of data analysis. Reaction times (RTs) and answers were recorded for the prime and the test trials.

After the instructions were presented, participants completed 20 practice trials. Following the practice trials, participants were presented a total of 160 pairs of words arranged in 10 blocks of 8 predefined pairs of prime and test trials. Blocks of 8 predefined pairs of prime and test trials were constructed upon 3 restrictions. The first restriction was that each word appeared only once in the prime trial and in the test trial and only once as a target or a distractor and never twice in a prime and test-trial sequence. The second restriction was that each pair of words appeared only once. The last restriction was that target words of the test trials in the experimental and the control conditions for each valence were respectively paired according to their length and their frequency. Frequency of words was found in Lexique 2 (New, Pallier, Brysbaert, & Ferrand, 2004) which is an online French lexical database. The 80 pairs of prime and test trials were randomly presented. Median RTs was calculated for grief-related, positive, and negative words into both conditions (experimental and control). After participants finished the experimental task, they were handed the MMSE. Completion of all the questionnaires and the

experimental task took approximately 90 minutes. Participants were then extensively debriefed and thanked for their participation. They were paid 15 euros for compensation.

Figure 1. Design: Negative affective priming. Two consecutive trials, a prime- and a test-trial are displayed. In each trial, the participant is instructed to evaluate the valence of a target word while ignoring a distractor. The time interval between the participants' evaluation and the presentation of the next pair of words is called the response-stimulus interval (RSI).



2.4. Design

As outlined in the Introduction, a negative affective priming design was used in the present study. As we hypothesized differences in the processing of three categories of words, namely grief-related, negative, and positive words, the traditional design (e.g., Joormann, 2006) was duplicated, with grief-related words paired with positive ones and negative words paired with positive ones (see Table 2). Accordingly, the design consisted of two experimentally manipulated within-subjects factors and a quasi-experimental between-subjects factor (high vs. low scorers on the RRS). The first within-subject factor was the experimental conditions (priming vs. control) in the sequential pairs of trials. The second within-subject factor was the emotional relevance (grief-related vs. positive and negative vs. positive) of the test-trial target.

Table 2. *Negative Priming and Control Conditions in the Negative Affective Priming Task*

	Prime trial		Test trial	
	Distractor	Target	Distractor	Target
Negative priming				
Positive target in the test trial	+	G	G	+
Grief-related target in the test trial	G	+	+	G
Control condition				
Positive target in the test trial	G	G	G	+
Grief-related target in the test trial	+	+	+	G
Negative priming				
Positive target in the test trial	+	-	-	+
Negative target in the test trial	-	+	+	-
Control condition				
Positive target in the test trial	-	-	-	+
Negative target in the test trial	+	+	+	-

Note. In the negative priming condition, the prime-trial distractor and the test-trial target are related by shared emotional relevance. In the control condition, the prime-trial distractor and the test-trial target are unrelated. G = grief-related word; + = positive word; - = negative word.

2.5. Data reduction

First of all, only RTs of correct responses were used to analyze negative affective priming (NAP) effects. Secondly, to prevent bias from potential misleading in affective word categorization (positive or negative), words with errors rate above 1 standard deviation from the mean were suppressed from analyses ($N = 3$ words; all were grief-related words: “adieux”, “condoléances” and “pleurer”). The total resulting errors rate corresponded to 5.2 % of all RTs. Thirdly, to reach normal distribution standards, participants with at least one median RTs upper or lower 2 standard deviations from the mean were suppressed from the analyses ($N = 3$). Finally, RTs of positive words that were associated with grief-related words were not included into analyses. Indeed, according to the terror management theory, grief-related words *per se* induce interference in cognitive

processing (e.g., Solomon, Greenberg, & Pyszczynski, 1991). Therefore, RTs of trials that had included pairs of positive words presented with grief-related words could not be representative of general positive words processing. As a result, only RTs of positive words that were associated with negative ones were analyzed in the present study.

2.6. ANOVA's assumptions

Before performing the analysis, the respect of the ANOVA's assumptions was checked. Kolmogorov-Smirnov tests across rumination groups for each type of words were not significant, which indicated that the data were normally distributed into the 6 conditions. In addition, the Mauchly's test of sphericity was not significant, which indicated covariance homogeneity. Finally, the Levene's tests of equality of variances were not significant, indicating that variance across rumination groups for each type of words were not heterogeneous. Taken together, those results suggest that the ANOVA's assumptions were respected.

3. Results

In line with previous studies, we expected to find a strong association between rumination and severe grief reactions. Present results confirmed this hypothesis. Rumination scores and grief reactions on the ITG measure were highly correlated, $r(61) = .78, p < .001$ in the complete sample and $r(26) = .91, p < .001$ in the final sample. Such a high correlation between rumination and grief reactions ($r(26) = .91$), although expected, deserved further considerations. Indeed, a correlation superior to .90 is close to the ceiling of the potential correlation between two constructs. Accordingly, the observed correlation may not be due to a fundamental relation between the two constructs but might be due to shared items. Systematic observations of the items were thus realized. In the RRS, symptoms-related items have been identified in addition to the rumination-related items. For example, items like "Think about how alone you feel" or "Think about your feelings of fatigue and achiness" appeared more related to symptoms (and then grief reactions) than ruminative processes (i.e., "Analyze recent events to try to understand why you are depressed"). Conversely, in the ITG, rumination-related items were identified in addition to the symptoms-related items. For example, items like "I think about {...} so much that it can be hard for me to do the things I normal do" or "Memories of {...} upset me"

appeared more related to rumination than strict grief symptoms (i.e., “I have pain in the same area of my body, some of the same symptoms, or have assumed some of the behaviors or characteristics of {...}”).

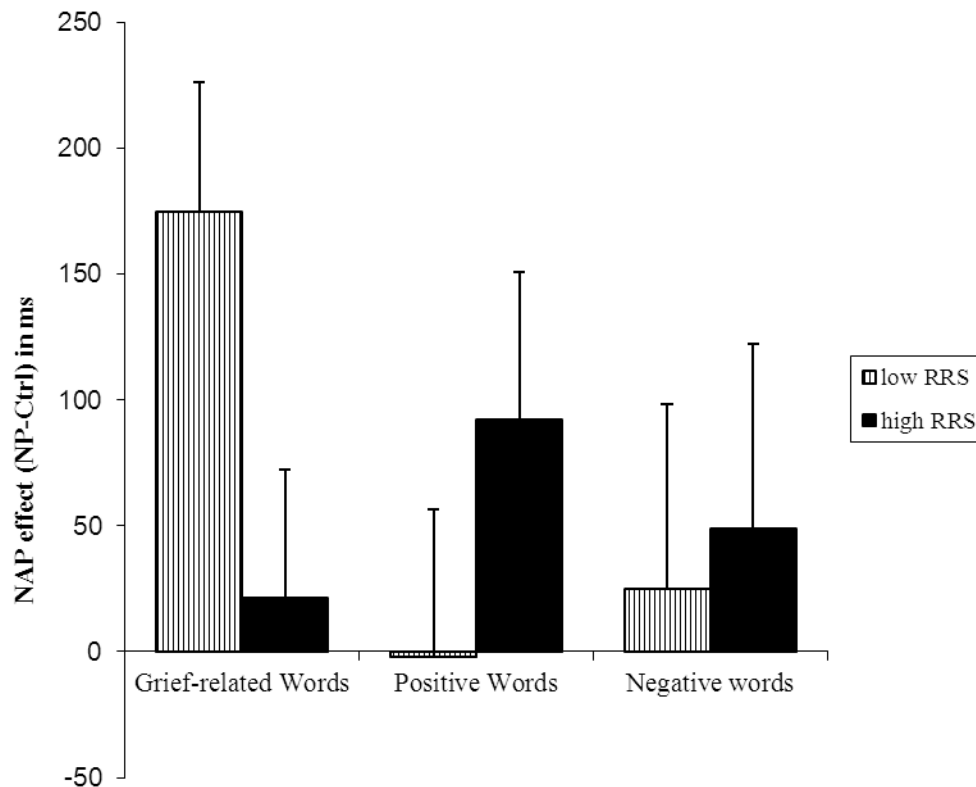
In an attempt to eliminate contaminated items as an alternative explanation for the extensive relation between rumination and grief symptoms severity, we removed the symptoms-related items from the RRS and the rumination-related items from the ITG. In total, 16 and 13 contaminated items were identified⁵ and removed from the 22-items RRS and the 30-items ITG, respectively. Cronbach’s alphas were minimally acceptable (.65) to high (.90) for the refined RRS and ITG, respectively. Correlations between the refined scales were then calculated. Interestingly, results for the total sample showed a diminished correlation, $r(61) = .54$, while results for the low and the high quartiles sample showed a still very high correlation, $r(26) = .86$. The diminished correlation in the total sample suggests that the total RRS and the total ITG measure encompassed overlapping items. However, the still very high correlation when only the lowest and highest ruminators of the sample were taken into account suggests that ruminative process (i.e., “Analyze recent events to try to understand why you are depressed”) should be considered as a mere indicator of grief symptoms severity (this will be discussed later). Taken together, these results lead to conclude that the very high correlation appear to be less explained by a methodological problem (i.e., overlap between measures) than by a very strong link between ruminative process and grief symptoms severity.

To analyze NAP effects in both rumination groups, a NAP effect score was calculated by subtracting RTs related to the control condition from RTs of the corresponding experimental condition and this for each type of word, respectively grief-related, positive and negative words (see Joormann, 2006). Accordingly, the more the

⁵ Contaminated items of both RRS and ITG were identified upon theoretical criteria. With regard to the RRS, because the symptoms-related items were less clear to identify, this is the process-related items that were first pointed out. This was done according to Folkman’s (2001) work on adaptive coping process, as well as Treynor, Gonzalez and Nolen-Hoeksema’s (2003) work, in which - reflexive and brooding - process-related vs. depression-related items have also been pointed out in the RRS. The remainder of items was then eliminated. With regard to the ITG, process-related items were identified (i.e., items which referred to the emotions and the processes associated with the “reschematization” process of Horowitz et al. (1993), as well as the processes associated with confrontation and avoidance). These were then eliminated.

resulting difference was elevated, the more the responses were slowed in the negative priming condition compared to the control condition. We hypothesized that higher NAP effects would occur for grief-related in the low rumination group compared to the high rumination group, but that no difference would be found in NAP effects between rumination groups for negative and positive words. NAP effects in participants with low and high rumination scores for each type of word are presented in Figure 2. A positive value represents a slowing down in the negative priming condition compared to the control condition (NAP effect). The less the value is elevated, the less the inhibition is present. Accordingly, a higher score (in ms) indicates a higher ability to control the access of irrelevant information into WM. A 3 x 2 MANCOVA with type of word as the within-subjects factor (grief-related vs. negative vs. positive), rumination as between-subjects factor (low vs. high), and age as covariate showed a main effect for type of word, $F(2, 46) = 3.33, p < .05, \eta^2 = .13$. More importantly and as expected, the interaction between the type of word and rumination group was marginally significant, $F(2, 46) = 3.01, p = .059, \eta^2 = .12$. No main effect was found for rumination, $F(1, 23) = 2.03, p = .17, \eta^2 = .08$.

Figure 2. Negative affective priming effect (ms) for grief-related, positive and negative words in participants with low and high RRS-Rumination scores representing RTs related to the control condition subtracted from RTs of the corresponding experimental condition. A higher score (in ms) indicates a higher ability to control the access of irrelevant information into WM. Error bars represent one standard error.



To examine the significant type of word main effect that was revealed in the MANCOVA, multiple comparisons were performed between NAP effects of grief-related ($M = 92.52$; $SD = 293.38$), positive ($M = 48.69$; $SD = 233.93$), and negative ($M = 38.06$; $SD = 260.63$) words. However, results did not show significant differences between NAP effects. In conclusion, even if findings revealed a main effect of type of word, post-hoc analyses did not allow determining which type of word was processed differently.

The hypothesized type of word by rumination group interaction revealed a p-value of .059. This result deserved further consideration. To examine the hypothesized inhibition difference between rumination groups according to the type of word, separate analyses were performed. First, we tested whether inhibition of grief-related words compared to positive words would be impaired according the level of rumination. In a second analysis,

we tested whether inhibition of grief-related words compared with negative words would be impaired according to the level of rumination.

With regard to the first analysis, a 2 x 2 ANCOVA was conducted with type of word as the within-subjects factor (grief-related and positive words), rumination as the between-subjects factor and age as covariate to compare NAP effects between rumination groups for grief-related and positive words. Results revealed a significant interaction between type of word and rumination group, $F(1, 23) = 4.49, p < .05, \eta^2 = .16$. Planned comparisons were then made with ANCOVA with age as covariate to test the rumination group effect on grief-related and positive words processing separately. Results showed a tendency toward significance revealing a stronger NAP effect for grief-related words in the low rumination group ($M = 175.29; SD = 348.73$) compared to the high rumination group ($M = 21.57; SD = 232.98$), $F(1, 23) = 3.34, p = .08, \eta^2 = .13$. These results tended to indicate that bereaved individuals with high rumination were less able to control or inhibit the access of grief-related words in comparison with bereaved individuals with low rumination. No difference between rumination groups were shown for positive words, $F(1, 23) = 2.32, p = .14, \eta^2 = .09$. In support of our hypotheses, these findings suggest that bereaved individuals with high rumination in comparison with bereaved individuals with low rumination tended to present more difficulties in inhibiting grief-related words whereas no difference between groups were observed in abilities of positive words inhibition.

Regarding the second separate analyses, a 2 x 2 ANCOVA was conducted with type of word as the within-subjects factor (grief-related and negative words), rumination as the between-subjects factor and age in covariate to compare NAP effects between rumination groups for grief-related and negative words. Results showed a main effect of rumination group revealing higher NAP effect in the low rumination group ($M = 100.21; SD = 150.13$) compared to the high rumination group ($M = 35.36; SD = 238.41$), $F(1, 23) = 6.27, p < .05, \eta^2 = .21$. No other main effect or interaction was significant, all $F_s < 1, p_s > .46$. Partially consistent with our hypotheses, these results indicated lower inhibition performances in the high rumination group compared to the low rumination group and this, whatever the type of word (grief-related and negative). However, when examining the actual difference between rumination groups in inhibition performances for negative words, no significant result was found, $F(1, 23) = 2.34, p = .14, \eta^2 = .09$. Taken together and consistent with our hypothesis, these results suggest a specific deficit for grief-related vs. negative words across rumination groups.

Our last hypothesis consisted in checking whether the obtained interaction between type of word and rumination group would be mainly explained by a difference in rumination, rather than by the level of grief reactions. Given the very high shared variance observed between rumination and grief reactions (82.80% when considering participants of the lowest and the highest quartile on the RRS measure), we could not really expected that inhibition deficits and rumination would be associated independently of the level of grief reactions. To however test our last hypothesis, the participant's ITG score was added as a covariate in the MANCOVA. The 3 x 2 MANCOVA with type of word as the within-subjects factor, rumination group as the between-subject factor, and age as well as ITG scores as covariates revealed that only the main effect of type of word remained statistically significant after partialling out grief reactions scores, $F(2, 44) = 4.88, p < .05, \eta^2 = .18$. The type of word by rumination group interaction was far from approaching significance, $F(2, 44) = .01, p = .99, \eta^2 = .00$. This finding suggested that negative priming effect cannot only and directly be explained by rumination.

4. Discussion

For a decade, it has consistently been shown that persistent and recurrent rumination about the loss and the deceased was predictive of poor long-term adjustment (for a review, see M.S. Stroebe et al., 2007). Nevertheless, the cognitive mechanisms implied in the development and the maintenance of such a maladaptive process remained unknown. For the first time in the bereavement field, the present study proposed a preliminary investigation of these cognitive mechanisms. Recent research has proposed that inhibitory processes in working memory (WM) underlie individual differences in the tendency to respond to negative moods and negative life events with rumination (Joormann, 2006). Accordingly, cognitive mechanisms that were explored consisted of the active inhibitory processes that keep irrelevant information from entering WM. It was hypothesized that bereaved individuals with high rumination compared with bereaved individuals with low rumination would show a specific deficit in the inhibition of instructed to-be-ignored information that was related to grief-related concerns. To test this hypothesis, participants with extreme scores of rumination (low and high) were compared when processing three types of words (grief-related, positive, and negative). A negative affective priming task

(NAP) was used to assess individual differences in the access limitation (inhibition) of to-be-ignored materials into WM.

Consistent with previous studies (e.g., Bonanno et al., 2005; Morina, 2011; van der Houwen et al., 2010), the present study confirmed the strong association between rumination and grief reactions severity. In addition, the current work provided data showing a significant interaction between the to-be-ignored type of word and the rumination group. More specifically, higher rumination was shown to be associated with lower NAP effects when processing grief-related information whereas no association was observed when processing negative and positive information. Consistent with our hypothesis, these results suggest that the tendency to ruminate after the loss of a significant person is associated with inhibition deficits when grief-related information has to be ignored in comparison to negative and positive information. Finally, whereas the association between rumination and inhibitory deficits was expected to remain significant even after controlling for grief reactions scores, the present study showed that differences in grief reactions scores accounted for variations in NAP effect too. Thus, even if inhibitory dysfunctions in WM and the tendency to ruminate in response to negative mood states were shown to be associated in the current study, results did not provide evidence for a direct link between inhibition and rumination among bereaved partners.

It is worth noting that most of the previously described results are consistent with recent research which has shown an association between elevated rumination and difficulties in inhibiting irrelevant (emotional) material. For example, results of the present study are consistent with Davis and Nolen-Hoeksema (2000)'s work in which the tendency to ruminate was shown to be closely related to perseveration and cognitive inflexibility or with Joormann and Gotlib's (2010) findings in which elevated rumination in depressed participants was shown to be related to enhanced access of negative material in WM in comparison to positive material.

Secondly, the present study corroborated and extended recent innovative research that examined the cognitive processes associated with the development and the maintenance of severe grief reactions. For example, Maccallum and Bryant (2010), have demonstrated that complicated grief was associated with information processing bias indicating preferential processing of information related to the death of a loved one. More specifically, they suggested that dysphoric mood and preoccupation with the loss could be maintained by selectively attending to reminders of the loss. In the present study, preferential processing –sustained processing of grief-related thoughts- was also

investigated but more precisely. Indeed, using the NAP design, it was possible to distinguish preferential facilitation/activation from inhibition accounts of selective attention (i.e., positive priming vs. negative priming respectively) (Neill et al., 1995). In the present study, results tended to show a deficit in access limitation (i.e., an absence of NAP effect) vs. access facilitation (i.e., a presence of a positive priming effect, that would have been indicated by negative value of NAP effect) of grief-related information. Accordingly, the information processing bias for death-related information that has been highlighted in complicated grievers in Maccallum and Bryant (2010)'s work could be further explained by deficits in the access limitation of grief-related information into WM rather than preferential selection/activation of them. In other words, sustained preoccupations with the loss could be more explained by the inability to control the grief-related thoughts that enter into WM rather than the favored focus on grief-related thoughts. Confirmations are needed in future studies.

Finally, the obtained relationship between rumination and deficits in the inhibition of grief-related material is consistent with Joormann (2010)'s model of emotion regulation (in depression) which suggests a close association between rumination and inhibition deficits for general negative information. Interestingly, this model postulates that individuals with enhanced access of negative material should present higher negative intrusive thoughts into their WM. The unintended occurrence of intrusive thoughts should in turn prevent the maintenance of a coherent stream of thoughts and lead them to initiate self-defeating cycle of increasingly negative thinking. Paralleling this model, results of the present study could be enlightened as follows: the bereaved individuals who present lower ability to control the access of specific grief-related contents in WM should experience greater grief-related thoughts that unintentionally enter consciousness. Such intrusions should lead in turn to perturbations in their stream of thought and finally, to the development of extensive rumination. It is worth noting that Joormann's model also suggests that the inability to limit the access of negative material into WM should hinder more adaptive elaborative processing such as the reappraisal or recall of mood-incongruent (positive) material. This last suggestion is particularly relevant to our topic as the proposed reappraisal can be conceptually associated with positive reappraisal and related positive event interpretation, two specific processes that have been suggested to be part of effective coping process in grief adjustment (see Stroebe, Schut, & Stroebe, 2005). Accordingly, in addition to promote rumination, inhibition deficits in bereaved individuals could also prevent core regulation strategies from being implemented. Future studies should test whether difficulties in

inhibiting the processing of grief-related and negative material would be associated with individual differences in the habitual use of positive reappraisal and positive event interpretation.

Some of the results were however found to be in contradiction with our hypotheses. While the present study provided interesting preliminary findings in the identification of cognitive processes associated with rumination after the death of a loved person, the reduced inhibition observed in this study cannot directly be related to rumination. Indeed, the association between inhibitory deficits and rumination did not remain significant when grief reaction scores were statistically controlled for. These results could (statistically) be explained by the extensive shared variance between the mental process of rumination and grief reactions. Such an extensive shared variance has been suggested to be due to similar item contents in both scales. Accordingly, future studies should use purer instruments tools to capture processes and symptoms distinctively. However, in the present study, the very high correlation found between rumination and grief severity - when only considering quartile groups - suggests that rumination and grief symptomatology are identical phenomenological experience (or that rumination is a mere symptom of grief). Yet, even if rumination has been found to be a causal factor for prospective grief symptomology - and considered as such in the present study -, rumination is also sometimes (more or less directly) suggested being a specific grief symptom (i.e., yearning, preoccupying thoughts about the deceased person) (Prigerson et al., 2009; Shear et al., 2011). According to the present results but also the mixed up literature, the relative difference between both conceptual constructs (rumination process and grief symptoms) should be also considered in future studies.

Despite the exciting preliminary results that the present study provides, several limitations that temper our conclusions have to be noted. First, in order to investigate the potential distinctive cognitive processes that underlie low and high rumination, the determination of the two groups was based on the centile 25 and the centile 75. However, even using this methodological procedure, the high rumination group did not reach clinical levels. Indeed, the centile 75 that was used to determine the high rumination group was 49.5 ($M = 42.31$, $SD = 11.29$) whereas the highest possible score on the RRS is 88 (RRS range: 22-88). Therefore, future studies should include participants with even more extreme rumination scores to further provide evidence for the cognitive mechanisms that underlie dysfunctional processes. Secondly, the rumination process was evaluated with the standard Ruminative Response Scale of the Response Style Theory (RRS) that is not specific to grief.

Conversely, this scale assesses the mode of responding to general sad feelings and symptoms of dysphoria. As a result, the present study examined the cognitive mechanisms that are associated with general rumination rather than bereavement-related rumination or specific extensive grief processing. To further investigate the specific cognitive mechanisms that are associated with bereavement-related rumination, future studies should include measures which precisely assess this particular form of rumination. With such a distinction, it might be possible to better capture the specific types of information that would be difficult to control for those experiencing extensive grief processing.

Thirdly, even if the participants of the present study did not show evidence of substance abuse (e.g., alcohol or medication) within the 6 past months, a thorough examination of their daily habits or even of their intake in the hours preceding the testing is lacking. Given the fact that psychotropic substances might influence cognitive processing (which includes cognitive inhibition) even in low dosage (e.g., Maurage et al., 2012), one has to ponder on the impact that such a variable might have had on the results of the present study. According to the probability of a relative psychotropic consumption in bereaved individuals, the future studies investigating cognitive inhibition in such a population should take this variable much more into consideration.

Finally, given that all of the variables were assessed at the same time point, the reported results are correlational and only indicate that inhibitory dysfunctions and rumination are related. Consequently, future studies that address the reported relation in longitudinal designs are needed to establish the causal role of inhibitory deficits on persistent rumination.

In conclusion, the present study provides stimulating findings in examining the relationship between rumination, a factor that has been shown to predict grief reactions severity, and specific cognitive inhibitory processes (i.e., access limitation). Bereaved individuals who frequently ruminate in response to sad feelings were found less able to prevent grief-related stimuli from entering their stream of consciousness. The ability to control the contents of WM may thus be crucial in understanding why some bereaved individuals remain trapped in recurring recycling of thoughts. In the present study, only the process of access limitation was investigated. As the efficient manipulation of information into WM not only depends on access limitation but also on the rejection of information that is no longer relevant, future studies assessing this second crucial process are required. Finally, further investigation of the relation between inhibitory processes and adaptive regulation strategies appears to be an important next step in research on vulnerability to

grief reactions severity. Indeed, knowing more about the mechanisms that lead to impairment of emotion regulation will offer a better understanding of the dysfunctional processes that could be targeted in future clinical interventions for bereaved individuals.

5. References

- Alario, F. X., & Ferrand, L. (1998). Normes d'associations verbales pour 366 noms d'objets concrets. *L'Année Psychologique*, 98(4), 659-709. doi: 10.3406/psy.1998.28564
- Boelen, P. A., & Van Den Bout, J. (2005). Complicated grief, depression, and anxiety as distinct postloss syndromes: A confirmatory factor analysis study. *American Journal of Psychiatry*, 162(11), 2175-2177. doi: 10.1176/appi.ajp.162.11.2175
- Bonanno, G. A., Papa, A., Lalande, K., Zhang, N., & Noll, J. G. (2005). Grief processing and deliberate grief avoidance: A prospective comparison of bereaved spouses and parents in the United States and the People's Republic of China. *Journal of Consulting and Clinical Psychology*, 73(1), 86-98. doi: 10.1037/0022-006X.73.1.86
- Davis, R. N., & Nolen-Hoeksema, S. (2000). Cognitive inflexibility among ruminators and nonruminators. *Cognitive Therapy and Research*, 24(6), 699-711. doi: 10.1023/a:1005591412406
- Douilliez, C., & Philippot, P. (2010). Measure of the Brooding and Reflection Dimensions of Rumination in the Ruminative Response Scale: a French Validation. *Manuscript submitted for publication*.
- Ferrand, L. (2001). Normes d'associations verbales pour 260 mots « abstraits ». *L'année psychologique*, 101(4), 683-721. doi: 10.3406/psy.2001.29575
- Folkman, S. (2001). Revised coping theory and the process of bereavement. In M.S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Hand-book of bereavement research: Consequences, coping, and care* (pp. 563-584). Washington, DC: American Psychological Association.
- Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). 'Mini mental state'. A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12(3), 189-198. doi: 10.1016/0022-3956(75)90026-6
- Fournet, N., Mosca, C., & Moreaud, O. (2007). Deficits in inhibitory processes in normal aging and patients with Alzheimer's disease: A review. *Déficits des processus inhibiteurs dans le vieillissement normal et la maladie d'Alzheimer*, 5(4), 281-294. doi: 10.1684/pnv.2007.0103
- Franck, M. (2009). *Attentional bias in grief: Emotional Stroop and Dot Prob construction task*. University of Louvain. Louvain-la-Neuve, Belgium.

- Grant, D. A., & Berg, E. (1948). A behavioral analysis of degree of reinforcement and ease of shifting to new responses in a Weigl-type card-sorting problem. *Journal of Experimental Psychology*, 38(4), 404-411. doi: 10.1037/h0059831
- Hasher, L., Stoltzfus, E. R., Zacks, R. T., & Rypma, B. (1991). Age and Inhibition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 17(1), 163-169.
- Hasher, L., Zacks, R. T., & May, C. P. (1999). Inhibitory control, circadian arousal, and age. In D. Gopher & A. Koriath (Eds.), *Attention & Performance, XVII, Cognitive Regulation of Performance: Interaction of Theory and Application* (pp. 653-675). Cambridge, MA: MIT Press.
- Joormann, J. (2004). Attentional bias in dysphoria: The role of inhibitory processes. *Cognition and Emotion*, 18(1), 125-147. doi: 10.1080/02699930244000480
- Joormann, J. (2006). Differential Effects of Rumination and Dysphoria on the Inhibition of Irrelevant Emotional Material: Evidence from a Negative Priming Task. *Cognitive Therapy and Research*, 30(2), 149-160. doi: 10.1007/s10608-006-9035-8
- Joormann, J. (2010). Cognitive inhibition and emotion regulation in depression. *Current Directions in Psychological Science*, 19(3), 161-166. doi: 10.1177/0963721410370293
- Joormann, J., & Gotlib, I. H. (2008). Updating the contents of working memory in depression: Interference from irrelevant negative material. *Journal of Abnormal Psychology*, 117(1), 182-192. doi: 10.1037/0021-843x.117.1.182
- Joormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: Relation to cognitive inhibition. *Cognition and Emotion*, 24(2), 281-298. doi: 10.1080/02699930903407948
- Maccallum, F., & Bryant, R. A. (2010). Attentional bias in complicated grief. *Journal of Affective Disorders*, 125(1-3), 316-322. doi: 10.1016/j.jad.2010.01.070
- Maurage, P., Joassin, F., Speth, A., Modave, J., Philippot, P., & Campanella, S. (2012). Cerebral effects of binge drinking: Respective influences of global alcohol intake and consumption pattern. *Clinical Neurophysiology*, 123(5), 892-901. doi: 10.1016/j.clinph.2011.09.018
- Morina, N. (2011). Rumination and avoidance as predictors of prolonged grief, depression, and posttraumatic stress in female widowed survivors of war. *The Journal of Nervous and Mental Disease*, 199(12), 921-927. doi: 10.1097/NMD.0b013e3182392aac
- Neill, W. T., Valdes, L. A., & Terry, K. M. (1995). Selective attention and the inhibitory control of cognition. In F. N. Dempster & C. J. Brainerd (Eds.), *Interference and inhibition in cognition* (pp. 207-261). San Diego, CA: Academic Press.

- New, B., Pallier, C., Brysbaert, M., & Ferrand, L. (2004). Lexique 2 : A new French lexical database. *Behavior Research Methods, Instruments, & Computers*, 36(3), 516-524.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100(4), 569-582.
- Nolen-Hoeksema, S. (2001). Ruminative coping and adjustment to bereavement *Handbook of bereavement research: Consequences, coping, and care*. (pp. 545-562): Washington, DC, US: American Psychological Association.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, 61(1), 115-121.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology*, 67(1), 92-104.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3(5), 400-424. doi: 10.1111/j.1745-6924.2008.00088.x
- Oberauer, K. (2001). Removing Irrelevant Information from Working Memory: A Cognitive Aging Study with the Modified Sternberg Task. *Journal of Experimental Psychology: Learning Memory and Cognition*, 27(4), 948-957. doi: 10.1037//0278-7393.27.4.948
- Prigerson, H. G., Horowitz, M. J., Jacobs, S. C., Parkes, C. M., Aslan, M., Goodkin, K., . . . Maciejewski, P. K. (2009). Prolonged grief disorder: Psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Medicine*, 6(8). doi: 10.1371/journal.pmed.1000121
- Prigerson, H. G., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: A rationale, consensus criteria, and a preliminary empirical test. In M. S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 613-645). Washington, DC, US: American Psychological Association, Washington, DC.
- Shear, M. K., Simon, N., Wall, M., Zisook, S., Neimeyer, R., Duan, N., . . . Keshaviah, A. (2011). Complicated grief and related bereavement issues for DSM-5. *Depression and Anxiety*, 28(2), 103-117. doi: 10.1002/da.20780
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of selfesteem and cultural worldviews. In M. E. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 91-159). San Diego, CA: Academic Press.

- Stroebe, M., Boelen, P. A., van den Hout, M., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance: a reinterpretation of its function in adjustment to bereavement. *European Archives of Psychiatry and Clinical Neuroscience*, 257(8), 462-472. doi: 10.1007/s00406-007-0746-y
- Stroebe, M. S., Schut, H., & Stroebe, W. (2005). Attachment in Coping With Bereavement: A Theoretical Integration. *Review of General Psychology*, 9(1), 48-66. doi: 10.1037/1089-2680.9.1.48
- Stroebe, M. S., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *Lancet*, 370(9603), 1960-1973. doi: 10.1016/s0140-6736(07)61816-9
- Syssau, A., & Font, N. (2005). Évaluations des caractéristiques émotionnelles d'un corpus de 604 mots. *Bulletin de Psychologie*, 58(3), 361-367.
- Tipper, S. P. (1985). The negative priming effect: Inhibitory priming by ignored objects. *The Quarterly Journal of Experimental Psychology Section A*, 37(4), 571-590. doi: 10.1080/14640748508400920
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, 27(3), 247-259. doi: 10.1023/a:1023910315561
- van der Houwen, K., Stroebe, M., Schut, H., Stroebe, W., & van den Bout, J. (2010). Mediating processes in bereavement: the role of rumination, threatening grief interpretations, and deliberate grief avoidance. *Social Science and Medicine*, 71(9), 1669-1676. doi: 10.1016/j.socscimed.2010.06.047

Chapter 4 - Bereavement-related
rumination and deficits in cognitive
inhibition: Evidence from a thought
suppression task

Abstract

Mental rumination is strongly associated with grief reactions severity. The present study investigated the relationship between rumination and the ability to suppress thoughts related to the loss of a loved person. Using Wegner's thought-suppression paradigm, conjugally-bereaved participants with low and high rumination (Rumination Index Questionnaire; RIQ) were asked to perform a 5-min stream-of-consciousness task in which they were instructed to think about anything except the 3-min previously activated thoughts, feelings, and memories about the loss and the deceased. At the end of the 5-min period, participants were asked to perform an emotional Stroop task with grief-related, positive, negative and neutral words. The implicit rebound of previously suppressed grief-related thoughts was assessed by measuring the extent to which performance on the Stroop task was influenced. Bereaved individuals with elevated rumination in comparison with those with low rumination were found to be less able to suppress grief-related, negative, and positive representation. In addition, they were found less able to suppress negative representations in comparison with grief-related and neutral ones. Deficits in inhibitory processes during bereavement are discussed in terms of their implications for sustained ruminative processes.

Keywords: bereavement, rumination, inhibition deficit, emotion regulation

1. Introduction

An accumulating body of research demonstrates that a subset of bereaved individuals experience prolonged psychological distress after the death of a loved one (Prigerson et al., 2009; Stroebe et al., 2007). Such distressful state is characterized by persistent and dysfunctional reactions such as sense of yearning for the deceased, difficulty accepting the loss, bitterness, lack of trust, and loss of perceived meaning in life (Prigerson et al., 2009).

Since two decades, several researchers have investigated the specific mental process of rumination after the loss of a significant person (Morina, 2011; Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Parker, & Larson, 1994; Stroebe et al., 2007; van der Houwen, Stroebe, Schut, Stroebe, & van den Bout, 2010). Mental rumination is generally defined as engaging in thoughts and behaviors that maintain one's focus on one's negative emotions and the possible cause and consequences of these emotions (Nolen-Hoeksema, 2001). Over the years, rumination has continuously been associated to the development of prolonged dysfunctional grief reactions (Stroebe et al., 2007). For example, Bonanno, Papa, Lalande, Zhang, and Noll (2005) has revealed that initial rumination was predictive of poor long-term adjustment. Consistent with this result, van der Houwen et al. (2010) have found that rumination at three points in time played an important role in mediating the impact of several risk factors (e.g., gender, social support, avoidant attachment, neuroticism) on grief reactions. Finally, Morina (2011) has also showed that rumination was predictive of prolonged grief symptom severity.

Despite growing evidence indicating that rumination is a strong predictor of enduring grief-related distress, its cognitive underlying mechanisms are still poorly understood. Recent research in the depression area has demonstrated the essential role of deficits in cognitive inhibition in the occurrence of elevated rumination (e.g., De Lissnyder et al., 2012; Demeyer, De Lissnyder, Koster, & De Raedt, 2012; Joormann, Yoon, & Zetsche, 2007). Moreover, in a recent model of emotion regulation (Joormann, 2010), deficient cognitive inhibition have been argued to cause mental rumination. Yet, cognitive inhibition has been described to be responsible for two crucial processes for the efficient manipulation of information into working memory (WM). The first process consists of the access limitation of irrelevant information into WM (Hasher, Zacks, & May, 1999). The second process consists of the rejection/updating of information that is no longer relevant from WM (Hasher et al., 1999). Accordingly, deficits in inhibitory processes should allow

intrusive thoughts to enter in WM as well as preclude no-longer relevant thoughts from being deactivated. The resulting inability to control the contents in WM should prevent the maintenance of a coherent stream of thoughts and favor the appearance of unintended recurring thoughts that characterize rumination (Joormann, 2010).

To our knowledge, only the study of Delespaux and Zech (submitted) has investigated the cognitive mechanisms which could explain the occurrence of prolonged mental rumination after the death of a loved person. In this study, the rumination process was specifically examined in relation with cognitive inhibitory processes. These cognitive processes were assessed with a negative affective priming task (NAP), a measure of access limitation of irrelevant emotional information into WM. The results of this study showed that elevated rumination was associated to deficits in access limitation of grief-related in comparison with negative and positive information, suggesting that prominent rumination was related to difficulties keeping irrelevant grief-related distractor from entering WM.

While the previously-reported results confirmed the association between rumination after the loss of a significant person and deficit related to the first process of cognitive inhibition (access limitation), no study has yet examined whether rumination is associated with difficulties regarding to the second process of cognitive inhibition (i.e., removing previously-relevant material from WM). Yet, difficulties inhibiting the processing of specific material that was, but is no longer, relevant might explain why people respond to negative mood states and negative life events such as bereavement with recurring, uncontrollable, and unintentional negative thoughts. As a result, further investigations of this second cognitive inhibitory process are needed.

In addition to the latter unexplored process, another limitation has to be pointed out in the existent findings showing a link between rumination and inhibition deficits. Indeed, in Delespaux and Zech (submitted)'s study, the rumination process was evaluated with the Ruminative Response Scale of the Response Style Questionnaire (RRS; Nolen-Hoeksema & Morrow, 1991; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). This questionnaire taps the frequency of thoughts in response to negative moods that are focused on the self (e.g., “think about all your shortcomings, failings, faults, mistakes”), on symptoms (e.g., “think about how hard it is to concentrate”), or on possible consequences and causes of moods (e.g., “analyze recent events to try to understand why you are depressed”). The use of the RRS was perfectly relevant according to the fact that prior research which had examined the association between rumination and subsequent grief severity had used the exact same scale (Nolen-Hoeksema & Larson, 1999; Nolen-Hoeksema et al., 1994). However, such

evaluation did not tap the specific bereavement-related rumination that has similarly been shown to increase grief severity (Bonanno et al., 2005; Morina, 2011; van der Houwen et al., 2010). For example, Morina (2011) used the rumination subscale of the Cognitive Emotion Regulation Questionnaire (Garnefski, Kraaij, & Spinhoven, 2001) that refers to the extensive thinking about the feelings and thoughts associated with specific negative events. More specifically to the experience of grief, Bonanno et al. (2005) investigated rumination as a specific grief processing with a home-produced scale measuring five behaviors (thinking about the deceased, searching for meaning, having positive memories of the deceased, talking about the deceased, and expressing feelings about the deceased). Finally, van der Houwen et al. (2010) used a homemade questionnaire that was based either on rumination in general and on rumination in bereavement specifically. Examples of items are: “I think about how bad I feel since my (...) died” and “I think about why my (...) has died”. According to the fact that specific bereavement-related rumination --in addition to more general rumination- has also been shown to predict grief severity, one can wonder about its cognitive underlying processes too.

As a result, the first aim of the present study was to examine the association between elevated specific bereavement-related rumination and deficits in the ability to expel/suppress grief-related as well as negative material from WM, in comparison with positive and neutral material. According to Joormann (2010)’s model, we hypothesized that the inability to expel/suppress grief-related and negative specific thoughts from WM would preclude these contents from being deactivated which in turn should lead to an increased processing of grief-related and negative information as well as subsequent persistent bereavement-related rumination.

One potentially useful method to investigate possible deficits in emotional material updating/suppression is to evaluate the ability to suppress specific emotional thoughts in a Thought Suppression Task (Wegner, Schneider, Carter, & White, 1987). In the classic Thought Suppression task, it has been shown that any individual engaging in thought suppression is likely to encounter the frequent intrusive return of that thought in later phases (Wegner et al., 1987). This ironic process of increased frequency of previously-suppressed thoughts has been called the post-suppression rebound effect. According to Wegner (e.g., Wegner et al., 1987), the rebound effect occurs because the action of suppression ironically primes the very thought one is trying to suppress, thereby making it more accessible to consciousness in later time. However, while the traditional post-suppression rebound effect has been shown when the to-be-suppressed thought was

neutral (e.g., a white bear), no post-suppression rebound effect was demonstrated when the to-be-suppressed thought was emotional (e.g., thoughts found to be personally intrusive and chronically suppressed in the past) (Kelly & Kahn, 1994). This latter finding suggested that the suppression of unwanted thoughts becomes possible with the development of defensive strategies for regulating attentional processes (Kelly & Kahn, 1994; Wegner, 1994; Wegner & Gold, 1995). Consequently, the investigation of a deficit in emotional material suppression could be established according to the ability to prevent the typical post-suppression rebound effect. Following Mikulincer, Dolev, and Shaver (2004)'s modified procedure of the Thought Suppression task, activation/accessibility of previously suppressed thoughts can be assessed by measuring the extent to which these thoughts influence performance on an emotional Stroop color-naming task (Stroop, 1938). Indeed, in the emotional Stroop paradigm, participants are presented with words relevant to their domain of concern along with neutral words. The difference between the time taken to name the color in which target words are presented in comparison to neutral words is suggested to indicate the degree to which these target words capture the individual's attention and cause interference in the color naming task (for a review, see Harvey, Watkins, Mansell, & Shafran, 2004; Maccallum & Bryant, 2010). According to Mikulincer et al. (2004, p. 942), the "activation of a specific mental representation increases attention to representation-congruent aspects of stimuli, thus slowing the naming of the color in which the stimuli are presented in the Stroop task. Hence, interference with the color-naming responses in the Stroop task indicates the accessibility of certain concepts or thoughts. Therefore, if previously suppressed grief-related/negative thoughts, as well as associated thoughts, remain activated (or highly accessible), this activation should slow the naming of the colors in which grief-related/negative words are presented".

To sum up, according to the fact that previous literature has shown that mental rumination strongly predicts grief severity, we planned to investigate the underlying cognitive mechanisms that could be linked to such a maladaptive process. In addition to a first study showing an association between elevated general rumination in bereaved individuals and deficits in one of the two core processes of cognitive inhibition (access limitation) (Delespaulx & Zech, submitted), the present study investigated bereavement-related rumination – merely called rumination below- in relation with the second core process of cognitive inhibition (thought suppression). In line with Mikulincer et al. (2004) thought suppression procedure, the present study used the emotional Stroop paradigm to examine the potential link between rumination and higher accessibility/activation of a

previously suppressed specific grief-related thought. Individuals with low and high rumination on a specific bereavement-related rumination scale (Rumination Index Questionnaire; RIQ) were first asked to recall a painful, emotionally intense, grief-related thought (activation period). Thereafter, they were asked to perform a 5-min stream-of-consciousness task with the instruction to think about whatever they wanted except the recalled painful thoughts (suppression period). Participants then performed a 64-trial Stroop task that included grief-related, negative, positive, and neutral words (potential rebound period). On each trial, they were asked to name the color in which successive single words were presented on a computer screen. Finally, participants were asked to rate how much they succeeded in the suppression of the previously activated thought.

According to the fact that previous literature has shown that mental rumination strongly predicts severe grief reactions, we first hypothesized that mental rumination and grief reactions would be highly associated. Following to the Joormann (2010)'s model of emotion regulation which suggests that rumination would be due to - in addition to impairment in access limitation - difficulties in no-longer relevant information updating, we next hypothesized that bereaved individuals with higher rumination would be less able to suppress their previously activated painful –and thus negative - grief-related thought during the 5-min stream-of-consciousness. Subsequently, we hypothesized that bereaved individuals in the high RIQ group would name the color of grief-related and negative words more slowly than bereaved individuals in the low RIQ group. Finally, we hypothesized that bereaved individuals in the high RIQ group would color name grief-related and negative words more slowly than positive and neutral words.

2. Method

2.1. Participants

Fifty-one individuals who had lost a significant relative since 6 to 18 months participated to the study. Forty-seven of them had lost a spouse whereas 4 of them had lost a child. The death was caused in 70.60 % of cases by disease, in 15.70 % by suicide, in 9.8 % by accident, in 2 % by natural cause and in 2 % by homicide. None of the participants presented a critical score on the Mini Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) which served as a test for severe cognitive impairment, nor a drugs or alcohol abuse, nor had participated in any previous attentional training which could have

improved their cognitive functions. The majority of participants were Belgian citizen with the exception of one Brazilian. All of them were French-speaking. Recruitment was made via obituary columns of regional daily newspaper and internet sites. In total, 38 participants accepted to take part to the study (response rate: 35.72 %). Considering the fact that the Rumination Index Questionnaire (RIQ; Michael & Snyder, 2005) scores distribution did not reach very high level ($M = 19.39$, $SD = 4.98$, RIQ range: 10-29), additional participants were further recruited. However, when they were contacted, pre-screening assessing severity of rumination (RIQ) and degree of dysfunctional impairment (“I believe that my grief has resulted in significant impairment in my social, occupational or other areas of functioning”) (28th item of the ITG; Prigerson & Jacobs, 2001) was realized. The 7 RIQ items scores and the 1 ITG item score, all tapped on 5-points scales, were aggregated and summed in a total score. Only participants with a total score higher than a 24 total score cut-off (each of items being experienced at least “often”) were selected for the study. Twenty-nine supplementary participants were then added to the sample. The centile 75 on the rumination scale (RIQ) was used to define two groups of distinct participants in their tendency to experience mental rumination (low ruminators and high ruminators respectively). The centile 75 was 24.5 ($M = 21$, $SD = 5.33$; RIQ range: 10-30). Table 1 presents the sample characteristics of the two groups. There were no significant differences in percentage of female or loss of a romantic partner, nor in age, in time since the death, in intimacy nor in length of relationship (for bereaved partner) between the groups. As expected, participants in the low rumination group showed significantly less intense grief reactions ($M = 66.58$; $SD = 18.55$) on the ITG than participants in the high rumination group ($M = 97.86$; $SD = 12.35$).

Table 1. *Sample characteristics*

	RIQ low	RIQ high	Test
N/N female	20/36	11/14	χ^2 -Test, n.s.
N/N loss of a romantic partner	34/36	12/14	χ^2 -Test, n.s.
Age (SD)	56.08 (8.75)	54.86 (10.75)	<i>t</i> -Test, n.s.
Time since the death (in months) (SD)	12.07(3.10)	13.64 (3.74)	<i>t</i> -Test, n.s.
Intimacy	5.56 (.73)	5.57 (.76)	<i>t</i> -Test, n.s.
Length of relationship (in year) (SD)	30.79 (11.18)	28.50 (11.67)	<i>t</i> -Test, n.s.
ITG	66.58 (18.55)	97.86 (12.35)	<i>t</i> (48) = -5.81***

Note. RIQ = Rumination Index Questionnaire (Michael & Snyder, 2005); ITG = Inventory of Traumatic Grief (Prigerson & Jacobs, 2001) is a measure of severity of grief reactions.

* $p < .05$; ** $p < .01$; *** $p < .001$.

2.2. Materials

Stimuli. Four lists of 4 words generated in Franck (2009)'s work were used in the present study (see Appendix 7.). The first list was composed of 4 grief-related words. The three other lists were made of 4 negative, 4 positive and 4 neutral words respectively. In Franck (2009)'s work, the 4 grief-related words were selected from a larger list of 147 French grief-related words especially generated by clinicians and scientists specialized in the grief field. The extent to which each word was related to grief was rated by 121 students on a 11 point-scale ranging from -5 (not grief-related) to +5 (grief-related). Only 4 words scoring above 2,5 were selected. These words were death, deadly, funeral, and remains. The 4 negative, positive and neutral words were selected from the Syssau and Font (2005)'s norm. This norm contains 604 words that were selected from two already published French emotional norms, including 348 concrete words (Alario & Ferrand, 1998) and 256 abstract words (Ferrand, 2001). The word emotional categorization was established from a valence evaluation constituted with a 3-modality scale (negative, neutral, and positive) and from a valence combined with intensity evaluation through a relative bipolar ordinal scale reaching 11 points. Examples of negative, positive, and neutral words are chaos, honesty, and shoes respectively. According to Larsen, Mercer, and Balota (2006)'s suggestions, in

Franck (2009)'s work, grief-related, negative, positive, and neutral words were matched for length, number of orthographic neighbours, and frequency of use.

Background and loss-related variables. Participants were asked about their gender, age, nationality, intimacy with the deceased - i.e., the extent to which they used to share their emotional experiences or concerns with the deceased - (ranging from 0 (*no intimacy*) to 6 (*high intimacy*)), relationship type with the deceased (i.e., husband/wife, companion, other), the length of relationship and cohabitation, the date and the cause of the death (i.e., natural, disease, accident, homicide, suicide, other to be specified).

Rumination. A French version of the Rumination Index Questionnaire (RIQ; Michael & Snyder, 2005) was used to assess the specific repetitive processing of grief-related thoughts (see Appendix 6). The RIQ is a measure of bereavement related rumination and meaning finding based upon the research of Silver and her colleagues (Holman & Silver, 1998; Silver, Boon, & Stones, 1983; Tait & Silver, 1989) and (Davis, Nolen-Hoeksema, & Larson, 1998). This measure was designed to tap (a) intrusive ideations related to the death and (b) the search for meaning in both the sense-making construal and benefit-finding construal. The first seven items tap repetitive thought about the death and the degree to which these thoughts were intrusive and distressing using a 5-point scale (Never-All the time). The other two items measure of the search for meaning. A continuous score ranging from 7 to 35 was calculated by summing the first 7 items. In the present sample, the Cronbach's alpha was high ($\alpha = .81$).

Grief adjustment. A French version of the Inventory of Traumatic Grief (ITG; Prigerson & Jacobs, 2001) was used to measure severity of grief symptoms (see Appendix 4). ITG is a 30-item self-report instrument assessing symptoms of prolonged grief (also called complicated or traumatic grief), as defined by a consensus panel (Prigerson et al., 1999). Questions cover separation distress (Criterion A) and traumatic distress (Criterion B) symptom clusters. Levels of symptom severity during the last month are tapped with five-point scales ranging from 1 (*never*) to 5 (*always*). A continuous score ranging from 30 to 150 was computed by summing the items. The reliability and validity of the scale have been demonstrated (e.g., Prigerson & Jacobs, 2001). In the present sample, Cronbach's alpha was high ($\alpha = .94$).

Subjective suppression rating. One question was added after the Stroop task to assess the degree to which participants succeed in thought suppression during the 5-min of stream-of-consciousness ("During this task, to what extent were you successful in not

thinking about your unwanted thought?”). The question was tapped with 7-point scales ranging from 1 (*not at all*) to 7 (*very much*).

Cognitive functioning. A French version of the Mini Mental State Examination (MMSE; Folstein et al., 1975) was used to control for the presence of cognitive impairment that could contribute for variations in reaction times. The MMSE is a reliable screening tool containing 30 questions that are used to test basic cognitive functions such as attention, language production, orientation, language comprehension, and immediate memory (e.g., participants are asked to designate routine objects, to repeat words and expressions, to write a sentence, or to perform mental subtractions). Each question is dummy coded (0 = *Wrong answer*; 1 = *Good answer*). People with normal cognitive functioning usually score high on the measurement, ranging from 27 to 30 in total scoring.

2.3. Procedure

Participants were run individually at the UCL laboratory. Testing was conducted by and splitted up into three different master’s level clinical psychologists previously trained to enhance reliability and consistency between them. Participants were first asked to sign the informed consent after being informed about the study process. The study consisted of three parts. In the first part, participants were administered the RIQ and the ITG questionnaires. In the second part, participants were instructed to evoke a painful, emotionally intense thought that usually pops out into their mind since the death of their loved one. The recalled thought had to be described during a 3-min period. Participants then performed a 5-min stream-of-consciousness task in which they were instructed to think continuously about whatever they wanted except the previously described thought. During this task, participants were asked to place a checkmark on a white sheet of paper every time they thought about the recalled painful thought. The number of checkmarks was used to check the effectiveness of the suppression instructions. Finally, participants performed a 64-trial Stroop task (adapted to grief; Franck, 2009) which involved naming the color of single target words successively presented on the monitor. The Stroop task was administered on a 16-inch desktop computer screen using E-Prime software. Participants were instructed that after a fixation cross, one word would appear on a dark background in the middle of the screen in one of four colors (red, blue, green, or yellow). For each word, participants had to name out loud in a microphone the color in which the target was presented. Response reactions times (RTs) were recorded. Following Franck (2009)’s design, each trial began with “XXXXX” in the middle of the screen (for 500 ms) followed

by a dark screen (250 ms). Immediately after the dark screen, one of the 16 words was presented in size 32 Arial font until the participant named one of the four colors. The trial then ended and the next trial began. Each combination of 1 of the 16 targets words and one of the four colors was shown one time, resulting in 4 presentations of each target word in a total of 64 trials (4 x 16). The order of presentation and the color of each target word were randomly determined for each participant, subject to the constraint that no more than 2 identical words were displayed successively. Participants were given 16 practice trials (4 neutral words each presented in red, blue, green, and yellow) and then 64 experimental trials. The neutral target words in the practice trial were different from those used in the experimental trials. Before the Stroop task, the microphone was adjusted to the voice of each participant to avoid lower or upper sound sensibility. Finally, participants' responses during the Stroop task were encoded by the experimenter to identify the possible errors in color-naming (e.g., saying blue instead of red). Reactions times corresponding to errors in color-naming were deleted from the analyses (4.09%). Finally, trials with response times lower than 100 ms (1.03 %) and greater than 2000 ms (0.31 %) were removed from the data. After participants had finished the experimental task, they were handed the Thought form and the MMSE in the third part of the study. Completion of all the questionnaires and the experimental task took approximately 90 minutes. Participants were then extensively debriefed and thanked for their participation. They were paid 15 euros for compensation.

2.4. Design

As outlined in the introduction, a Stroop task was administered during the so-called rebound period. As we hypothesized differences in the processing of four categories of words (grief-related, negative, positive, and neutral), the design consisted of an experimentally manipulated within-subjects factor (grief-related, negative, positive, and neutral targets) and a quasi-experimental between-subjects factor (high vs. low scorers on the RIQ).

3. Results

3.1. Rumination and severity of grief reactions

RIQ scores and grief reactions were highly correlated in the present study, $r(50) = .81$, $p < .001$. This finding suggested that bereaved individuals with higher RIQ score presented more severe grief reactions.

3.2. Subjective suppression rating during the suppression period

The extent to which participants reported they were successful in not thinking about their unwanted thoughts during the 5-min stream-of-consciousness was shown to be negatively correlated to rumination, ($r(27) = -.51$, $p < .01$). This finding suggested that bereaved individuals who reported less subjective abilities to suppress a previously-activated negative grief-related thoughts, experienced higher levels of rumination.

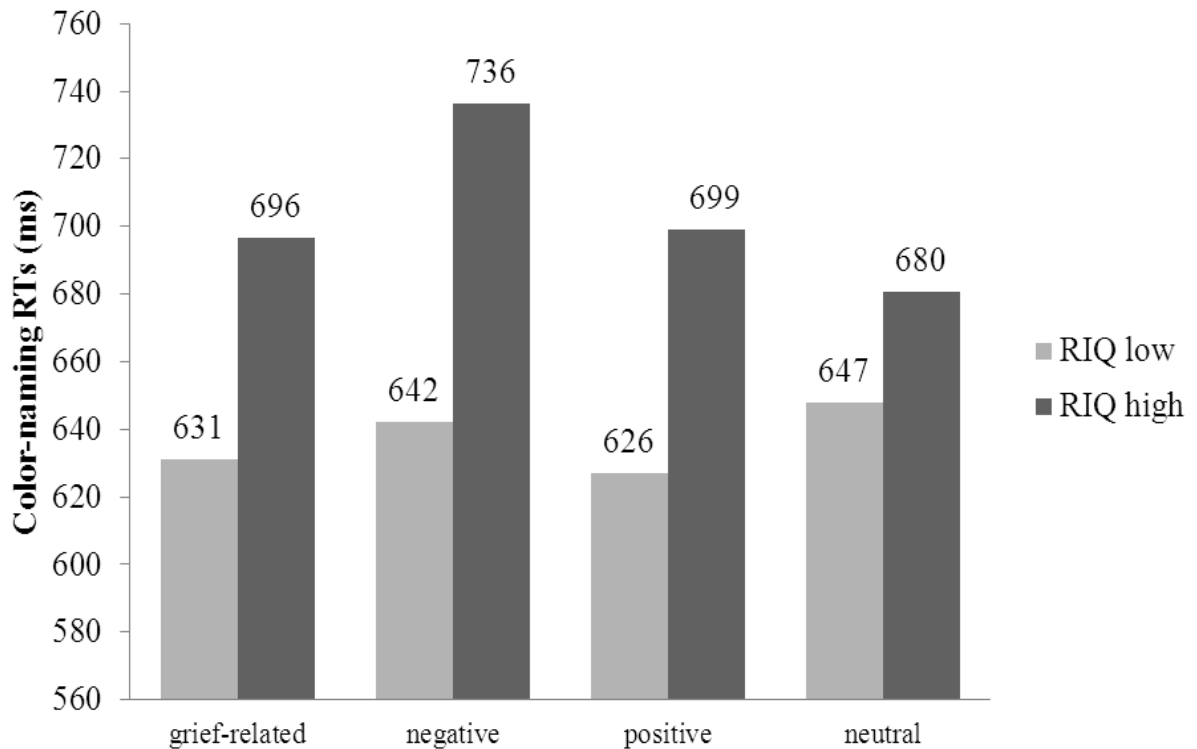
3.3. Stroop reactions times (RTs) during the rebound period

For each person, median color-naming RTs were generated according to the type of target word (grief-related, negative, positive, neutral). RTs of participants with low and high rumination scores for each type of word are presented in Figure 1. We first hypothesized longer RTs times for grief-related and negative words in the high rumination group compared to the low rumination group. We also hypothesized longer RTs for grief-related and negative words in the high rumination group in comparison with positive and neutral words. To test the relationship between rumination and interference in color-naming according to the type of target word, we performed a 4 x 2 MANOVA with type of word as within-subjects factor (grief-related vs. negative vs. positive vs. neutral) and rumination as between-subjects factor (low vs. high). Results revealed a main effect for type of word, $F(3, 144) = 3.63$, $p < .05$, $\eta^2 = .06$ and a significant interaction between the type of word and rumination groups, $F(3, 144) = 3.31$, $p < .05$, $\eta^2 = .06$. No main effect was found for rumination groups, $F(1, 48) = 2.40$, $p = .13$, $\eta^2 = .05$.

A first sequence of post-hoc comparisons between RTs of each type of words was executed to examine the significant type of word main effect. Results showed longer RTs for negative words ($M = 668.56$; $SD = 160.53$) in comparison with RTs for positive words ($M = 647.12$; $SD = 135.78$), $t(49) = 2.08$, $p < .05$. Furthermore, results showed that negative words ($M = 668.56$; $SD = 160.53$) tended to have longer RTs than grief-related

words ($M = 649.44$; $SD = 133.02$), $t(49) = 1.89$, $p = .06$. No other difference was found between RTs of grief-related words ($M = 649.44$; $SD = 133.02$), positive ($M = 647.12$; $SD = 135.78$), and neutral words ($M = 657.03$; $SD = 141.57$), all t s < -1.30 , p s $> .31$. Taken together, these last results suggested that bereaved individuals whatever their rumination group experienced greater implicit accessibility of negative representations in comparison with positive and grief-related representations. Quite surprisingly, these findings suggested that negative representations would remain more activated than positive and grief-related ones after having suppressed a grief-related thought.

Figure 1. Color-naming reactions times (ms) for grief-related, negative, positive and neutral words in participants with low and high RIQ-Rumination scores.



A second sequence of three different analyses was executed to further investigate the significant type of word by RIQ group interaction that was revealed. First, with regards to our first hypothesis, post-hoc comparisons were made with ANOVA to test the hypothesized RIQ group effect for each type of word processing. Only tendencies toward significance were observed. First, results showed a tendency toward significance revealing longer RTs for grief-related words in the high RIQ group ($M = 696.57$; $SD = 122.83$) in

comparison with the low RIQ group ($M = 631.11$; $SD = 133.95$), $F(1, 49) = 2.52$, $p = .12$. Second, results showed a tendency toward significance revealing longer RTs for negative words in the high RIQ group ($M = 736.29$; $SD = 170.38$) in comparison with the low RIQ group ($M = 642.22$; $SD = 150.82$), $F(1, 49) = 3.65$, $p = .06$. Finally, results showed a tendency toward significance revealing longer RTs for positive words in the high RIQ group ($M = 699.21$; $SD = 112.14$) in comparison with the low RIQ group ($M = 626.86$; $SD = 140.12$), $F(1, 49) = 2.98$, $p = .09$. No difference was observed between groups for neutral words, $F(1, 49) = .54$, $p = .47$. Taken together, these results indicated that bereaved individuals in the high RIQ group tended to show higher implicit accessibility of grief-related, negative, and positive words representations in comparison with bereaved individuals in the low RIQ group. Such findings suggested that higher rumination was related to fewer abilities to prevent activation of grief-related, negative and positive contents in WM, while no link was shown between rumination and the ability to prevent activation of neutral contents.

Second, with regard to our second hypothesis, post-hoc comparisons between RTs of each type of word were made in the high RIQ group using paired t -tests. Results indicated that negative words ($M = 736.28$; $SD = 170.39$) tended to have longer RTs than neutral words ($M = 680.67$; $SD = 117.48$), $t(13) = 2.10$, $p < .06$. Results also indicated that negative words ($M = 736.28$; $SD = 170.39$) tended to have longer RTs than grief-related words ($M = 696.57$; $SD = 122.83$), $t(13) = -1.68$, $p < .12$. No significant difference was observed for the three other RTs type of word comparisons, all $ts < 1.46$, $ps > .16$. These results suggested that bereaved individuals in the high RIQ group tended to show higher implicit accessibility of negative representations in comparison with grief-related and neutral representations.

Finally, post-hoc comparisons between RTs related to each type of word were made in the low RIQ group using paired t -tests. Results showed a significant difference between positive words and neutral words revealing shorter RTs for positive words ($M = 626.86$; $SD = 140.12$) in comparison with neutral words ($M = 647.83$; $SD = 150.40$), $t(35) = -2.37$, $p < .05$. Results also showed that grief-related words ($M = 631.11$; $SD = 133.91$) tended to have shorter RTs than neutral words ($M = 647.83$; $SD = 150.40$), $t(35) = -1.91$, $p = .06$. No other significant difference was observed when comparing RTs of each type of word between them, all $ts < 1.57$, $ps > .12$. Taken together, these results suggest that bereaved individuals in the low RIQ group were better to inhibit implicit accessibility of grief-related

and positive representations in comparison with neutral ones after being instructed to suppress a grief-related thought.

To check if the obtained interaction between type of word and rumination group was mainly explained by a difference in rumination, rather than by the level of grief reactions, the participant's ITG score was added as a covariate in the MANCOVA. The 4 x 2 MANCOVA with type of word as the within-subjects factor, rumination group as the between-subjects factor, and ITG scores as covariate revealed that neither the main effect of word, nor the interaction remained statistically significant after partialling out grief reactions scores, all $F_s < 1.31$, $p_s > .27$. These results suggested that differences in RTs cannot only and directly be explained by the level of rumination. Furthermore, these results also suggested that RTs could be explained by the level of grief reactions too.

4. Discussion

Since a decade, it has consistently been shown that persistent rumination about the loss and the deceased was predictive of poor-long-term adjustment (for a review, see Stroebe et al., 2007). Nevertheless, the cognitive mechanisms implied in the development and the maintenance of such a deleterious process still remain poorly investigated. Recent research has proposed that cognitive inhibitory processes in working memory (WM) underlie individual differences in the tendency to engage in rumination (Joormann, 2010).

In order to complete a first study in the bereavement field, the present study has investigated the potential relationship between extensive rumination and lower abilities in thought suppression. Abilities in thought suppression were assessed in the present study through performance in a Stroop task with grief-related, negative, positive, and neutral words after being instructed to suppress a previously activated painful grief-related thought. It was hypothesized that bereaved individuals with high rumination should be less able to suppress such a grief-related thought from their stream-of-consciousness.

Consistent with previous studies (Morina, 2011; Stroebe et al., 2007; van der Houwen et al., 2010), the present study confirmed the strong association between rumination and grief reactions. In addition, the current work provided data showing a link between higher levels of rumination and fewer abilities in cognitive inhibition.

First, less subjective suppression rating during the 5-min of stream-of consciousness (suppression period) was shown to be associated with more severe rumination. Consistent with our hypotheses, this finding suggests that rumination is associated with difficulties in

removing previously relevant information from WM. In addition to this, the present study also provided data showing a significant interaction between rumination and the type of word presented in the Stroop task (rebound period). More specifically, bereaved individuals in the high RIQ group showed a tendency to be slower when color naming grief-related, negative, and positive words in comparison with bereaved individuals in the low RIQ group. No difference was found between groups when color naming neutral words. Taken together, these results suggest that bereaved individuals with high rumination were less able to suppress/control the activation of grief-related, negative, and positive representations.

The difficulty for high ruminators in comparison with low ruminators to suppress emotionally relevant representations after they have been activated in WM converges with a growing body of literature in the depression field showing that high ruminators exhibit reduced ability to suppress no-longer relevant emotional information from WM (Joormann & Gotlib, 2008; Joormann, Levens, & Gotlib, 2011; Joormann et al., 2007). Also, these results fit with the general Joormann (2010)'s model of emotion regulation which claims that perduring thought repetition would be due to deficits in no-longer relevant thought suppression.

By the use of a similar design, the pattern of responses revealing that high bereaved ruminators tended to show higher implicit accessibility of grief-related and negative representations also resembles the observed difficulties among anxiously-attached in suppressing thoughts about a painful separation (Mikulincer et al., 2004). In this study, anxiously attached individuals were shown to present higher implicit accessibility of separation-related thoughts as well as negative self-representations. While participants of this study were not bereaved, the resemblance in pattern of findings is not surprising. Attachment anxiety is indeed proposed to be associated to rumination with regard to the loss of an attachment figure (e.g., Mikulincer & Shaver, 2008). Accordingly, it seems coherent that high bereaved ruminators, as well as anxiously attached individuals have difficulties in suppressing thoughts about a painful separation and instead retain high access to these thoughts and associated negative self-representations.

Finally, the present results complete the prior study by Delepau and Zech (submitted) which investigated the relation between rumination and deficit in access limitation of irrelevant information into WM. In this study, bereaved individuals who frequently ruminate in response to sad feelings were found to be less able than those with low level of rumination to prevent grief-related distractor from entering their stream of consciousness. However, the question remained as to whether rumination is only

associated to deficits in access limitation rather than deficits in access limitation and deficits in suppression (one or both of them). According to the present results, we now know that rumination is also associated with deficits in the suppression of grief-related, negative, and positive information.

Beyond the contribution of the present findings, some unexpected results have to be highlighted. Indeed, the results showed that the bereaved individuals with high rumination were less able to suppress/control the activation of grief-related and negative representations but also positive ones. Beyond the fact that a difference between the rumination groups was not expected for positive representations, this finding is also in contradiction with a recent research in the depression field which has showed that rumination is associated to difficulties in the updating/suppressing of negative material in comparison to positive material (Joormann & Gotlib, 2008).

The observation in the high RIQ group of fewer abilities in the suppression/control activation of positive representations might be explained by two reasons. First the specific situation of grief has to be emphasized. Indeed, when bereaved participants have been asked to recall a painful grief-related thought, in addition to the activation of very hurting thoughts related to the reality of the death, they might also have reactivated positive thoughts and feelings related to the loved one (see the positive memories included in the measurement of rumination in Bonanno et al. (2005) study; see Appendix 10.). Indeed, being overwhelmed by intense sadness due to the loss of a beloved person while experiencing pleasurable reveries related to this person has been demonstrated in different publications (e.g., Shear, Frank, Houck, & Reynolds, 2005). Furthermore, the coexistence of negative and positive representations have been preliminary established in a recent study which has demonstrated that bereaved individuals with complicated grief presented both pain-related neural activity (related to the social pain of loss) and reward-related neural activity (related to attachment behavior) response when activated to reminders of the deceased (O'Connor et al., 2008).

Another complementary justification can be proposed to explain the observation of fewer abilities in the suppression/control activation of positive representations. The positive words that were selected from a validated norm might be connected to the situation of grief despite the fact that they were evaluated as being positive words in a general population. Indeed, the four words were “ring”, “guitar”, “bravery”, “honesty”. The “ring” word, for example, might be related to grief as this object might be representing the marriage union to the conjugally bereaved participants. In the same way, “bravery

“might remind the courage of the deceased person at the end of his/her life when dealing with illness or death itself. In conclusion, if the positive words were related to grief representations, one could expect that bereaved individuals with high rumination could be less able to control the activation of such words in the same way that there are less able to control the activation of the grief-related and negative ones.

In addition to the previously reported results, the present study also showed that bereaved individuals with high rumination tended to be slower to respond to negative words than grief-related and neutral words. No other difference was found in this group between responses to negative and positive words, nor between responses to grief-related or positive words and neutral words. Consistent with our hypothesis, these results suggest that bereaved individuals with high rumination were less able to suppress/control activation of negative representations in comparison with neutral ones. However, contrary to expectation, these results also suggest that bereaved individuals with higher rumination were less able to suppress/control activation of negative representation in comparison with grief-related ones.

The surprising observation in the high RIQ group of greater accessibility of negative representations in comparison to grief-related ones could be explained by two complementary line of research. First, in a recent literature review, it has been proposed that rumination after the loss of a significant person -characterized by persistent and passive focus on negative emotions and symptoms- could be understood as an avoidant strategy (Stroebe et al., 2007). According to this point of view, the bereaved ruminator appears to focus exclusively on negative contents that are not directly related to the reality of the loss and this, in order to avoid what it is simply too painful to confront (Stroebe et al., 2007). In corroboration of this, a second line of research has shown a strong link between rumination after the loss of a loved person and engagement in cognitive avoidant strategies (Boelen & Van Den Bout, 2010; Morina, 2011; van der Houwen et al., 2010). With regards to these both line of research, we could then suggest that bereaved individuals with high rumination should experience persistent processing of negative information but without direct elaboration about the reality of the death. To prevent the direct elaboration of the death, they might chronically use cognitive avoidant strategies. The recurrent use of them might lead in turn to more developed abilities in the control of the specifically avoided thoughts (i.e., the reality of the death). As a result, when presented to grief-related cues, bereaved individuals with high rumination could be more able to suppress their grief-

related representation than their more general negative ones. This should be further investigated in future studies.

Finally, when controlling for grief reactions scores, the rumination by type of word interaction was not significant anymore. These results suggested that rumination was not directly linked to the observed cognitive deficits but also that grief reactions might account for variations in suppression effects too. The fact that not only rumination but also grief reactions had influence on cognitive inhibition is not very surprising. Firstly, consistent with previous research (Stroebe et al., 2007), rumination and ITG have been shown to be highly correlated in the present study, to the extent that they shared 65 % of variance. This can be explained by a potential conceptual overlap between the process of rumination and grief reactions as they are assessed in the ITG. Indeed, separation distress (criteria A) in the ITG is assessed by items tapping intrusive thoughts about the deceased as well as difficulties in acknowledging the death. These are both reactions that appear to be the essence of rumination. As a result, to better understand the relative contribution of deficits in inhibition to the process of rumination and grief reactions, future studies should use for example, a longitudinal design to disentangle the relative impact of each variable, on one another and check then if cognitive inhibition is more a rumination-related process than a grief reaction-related one.

Finally, the observation of a potential link between higher grief reactions and deficits in cognitive suppression converges with a recent study which have showed an association between complicated grief and higher focus of attentional resource on grief-related cues in comparison with neutral one (Maccallum & Bryant, 2010). While deficit in WM updating differs from allocating additional cognitive resource on grief-related cues (i.e., target word) both processes are proposed to depend on cognitive inhibition (Fournet, Mosca, & Moreaud, 2007). It could be interesting in future studies to clearly identify whether both processes are deficient in bereaved individuals with severe grief symptoms, or whether there is a common deficient process which underlie both cognitive dysfunctions (i.e., deficit in WM updating and attentional bias).

With regard to the present findings, even if they constitute a major step toward the investigation of the underlying cognitive mechanisms of rumination, they have to be considered carefully. Firstly, the present quasi-experimental design prevents from drawing conclusions about temporal precedence. Accordingly, even if the aim of the present study was to examine the cognitive underlying processes of rumination, we cannot assert that the observed deficits are at the basis of the development of sustained rumination. Future

longitudinal studies are needed to confirm this assumption. Secondly, rather than significant differences between the rumination groups, nearly tendencies were observed. The reason why we decided to report these tendencies was to avoid type 1 error (in the present analyses, the statistical power was weak which in turn increased the probability to accept H0 while H1 was correct). Future studies should use samples with more participants in both rumination groups to increase the statistical power of the analyses.

Thirdly, no Stroop baseline (Stroop before and after the suppression task) was included in the present procedure. Even if the suppression paradigm has worked well in previous studies of loss-related thought suppression (e.g., Fraley & Shaver, 1997; Mikulincer et al., 2004), we cannot then clearly attribute the observed difference to a difficulty in thought suppression. For example, it is possible that the pattern of findings reported here (i.e., interference in a Stroop task) might not be the result of a higher accessibility of previously suppressed thought but rather the results of an attentional bias to salient information or a difficulty disengaging attention from this information (like in Maccallum & Bryant, 2010). Future studies should include Stroop baselines or even designs that more clearly assess cognitive suppression. For example, in the depression field, the relation between rumination and inhibitory processes Joormann and Gotlib (2008) has been examined using a modified Sternberg task (Oberauer, 2001). This task has proposed to be a specific measure of WM updating from emotional material that is no longer relevant. As a consequence, using this measure could be convenient for further investigation of prolonged grief-related rumination and potential deficit in WM updating.

Fourthly, even if the participants of the present study did not show evidence of substance abuse (e.g., alcohol or medication) within the 6 past months, a thorough examination of their daily habits or even of their intake in the hours preceding the testing is lacking. Given the fact that psychotropic substances have been shown to influence cognitive processing (which includes cognitive inhibition) even in low dosage (e.g., Maurage et al., 2012), one has to ponder on the impact that such a variable might have had on the results of the present study. According to the probability of a relative psychotropic consumption in bereaved individuals, the future studies investigating cognitive inhibition in such a population should take this variable much more into consideration.

Finally, the stimuli presented in the Stroop task have been selected from evaluation and norms based on general population instead of a bereaved one. Some of the stimuli categorized as negative, positive, and neutral might have had some connection with grief-related representations (as suggested above with positive words). Conversely, the grief-

related stimuli (i.e., death, deadly, funeral, and remains) might have had no specific connection with the grief-related thought that was requested to be suppressed. Accordingly, we suggest to be careful with regard to the interpretations of the observed Stroop task effects. Future studies should use stimuli that have been pre-tested in a bereaved population or even that are relevant for the specific bereaved individual involved in the study. For example, it would be relevant to present grief-related stimuli that are directly selected from the 3-min description of the grief-related thoughts by the individual him/herself. The link between abilities in this specific thought suppression and the implicit reactivation of related representation might then be more direct.

To sum up, the present study completes the prior study by Delespaux and Zech (submitted) which has shown a link between rumination and specific cognitive inhibitory processes. In the present study, bereaved individuals who frequently ruminate about the loss and the deceased were found to be less able to control the activation of grief-related, negative, and positive representations after being told to suppress a painful grief-related thought. In addition, they were found to be less able to control the activation of negative representations in comparison to grief-related and neutral ones.

In conclusion, the ability to control the activation in WM of grief-related, negative, and positive representations -and more specifically the negative ones- may be crucial in understanding why some bereaved individuals remained trapped in recurring recycling of thoughts. Future studies should investigate the extent to which deficits in such processes could be improved through procedures for strengthening cognitive control (e.g., cognitive training) (Baert, Koster, & De Raedt, 2011; Bomyea & Amir, 2011). While providing additional implications for efficacious clinical interventions, this could also further support for the causality of the relationship between cognitive inhibition and ruminative processes.

5. References

- Alario, F. X., & Ferrand, L. (1998). Normes d'associations verbales pour 366 noms d'objets concrets. *L'Année Psychologique*, 98(4), 659-709. doi: 10.3406/psy.1998.28564
- Baert, S., Koster, E. H. W., & De Raedt, R. (2011). Modification of information-processing biases in emotional disorders: clinically relevant developments in experimental psychopathology. *International Journal of Cognitive Therapy*, 4, 208-222.
- Boelen, P. A., & Van Den Bout, J. (2010). Anxious and depressive avoidance and symptoms of Prolonged Grief, depression, and Post-Traumatic Stress Disorder. *Psychologica Belgica*, 50(1-2), 49-67. doi: 10.1371/journal.pmed.1000121
- Bomyea, J., & Amir, N. (2011). The Effect of an Executive Functioning Training Program on Working Memory Capacity and Intrusive Thoughts. *Cognitive Therapy and Research*, 35(6), 529-535. doi: 10.1007/s10608-011-9369-8
- Bonanno, G. A., Papa, A., Lalande, K., Zhang, N., & Noll, J. G. (2005). Grief processing and deliberate grief avoidance: A prospective comparison of bereaved spouses and parents in the United States and the People's Republic of China. *Journal of Consulting and Clinical Psychology*, 73(1), 86-98. doi: 10.1037/0022-006X.73.1.86
- Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making Sense of Loss and Benefiting from the Experience: Two Construals of Meaning. *Journal of Personality and Social Psychology*, 75(2), 561-574.
- De Lissnyder, E., Koster, E. H. W., Goubert, L., Onraedt, T., Vanderhasselt, M. A., & De Raedt, R. (2012). Cognitive control moderates the association between stress and rumination. *Journal of Behavior Therapy and Experimental Psychiatry*, 43(1), 519-525. doi: 10.1016/j.jbtep.2011.07.004
- Delespaux, E., & Zech, E. (submitted). Why do bereaved partners experience interfering rumination? Evidence for deficits in cognitive inhibition. *Death Studies*.
- Demeyer, I., De Lissnyder, E., Koster, E. H. W., & De Raedt, R. (2012). Rumination mediates the relationship between impaired cognitive control for emotional information and depressive symptoms: A prospective study in remitted depressed adults. *Behav Res Ther*, 50(5), 292-297. doi: 10.1016/j.brat.2012.02.012
- Ferrand, L. (2001). Normes d'associations verbales pour 260 mots « abstraits ». *L'année psychologique*, 101(4), 683-721. doi: 10.3406/psy.2001.29575

- Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). 'Mini mental state'. A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12(3), 189-198. doi: 10.1016/0022-3956(75)90026-6
- Fournet, N., Mosca, C., & Moreaud, O. (2007). Deficits in inhibitory processes in normal aging and patients with Alzheimer's disease: A review. *Déficits des processus inhibiteurs dans le vieillissement normal et la maladie d'Alzheimer*, 5(4), 281-294. doi: 10.1684/pnv.2007.0103
- Fraley, R. C., & Shaver, P. R. (1997). Adult attachment and the suppression of unwanted thoughts. *Journal of Personality and Social Psychology*, 73(5), 1080-1091.
- Franck, M. (2009). *Attentional bias in grief: Emotional Stroop and Dot Prob construction task*. University of Louvain. Louvain-la-Neuve, Belgium.
- Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences*, 30(8), 1311-1327. doi: 10.1016/s0191-8869(00)00113-6
- Harvey, A., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive Behavioural Processes across Psychological Disorders: a Transdiagnostic Approach to Research and Treatment*. Oxford University Press: Oxford.
- Hasher, L., Zacks, R. T., & May, C. P. (1999) Inhibitory control, circadian arousal, and age. *Vol. 17* (pp. 653-675).
- Holman, E. A., & Silver, R. C. (1998). Getting "stuck" in the past: Temporal orientation and coping with trauma. *Journal of Personality and Social Psychology*, 74(5), 1146-1163. doi: 10.1037/0022-3514.74.5.1146
- Joormann, J. (2010). Cognitive inhibition and emotion regulation in depression. *Current Directions in Psychological Science*, 19(3), 161-166. doi: 10.1177/0963721410370293
- Joormann, J., & Gotlib, I. H. (2008). Updating the contents of working memory in depression: Interference from irrelevant negative material. *Journal of Abnormal Psychology*, 117(1), 182-192. doi: 10.1037/0021-843x.117.1.182
- Joormann, J., Levens, S. M., & Gotlib, I. H. (2011). Sticky thoughts: Depression and rumination are associated with difficulties manipulating emotional material in working memory. *Psychological Science*, 22(8), 979-983. doi: 10.1177/0956797611415539
- Joormann, J., Yoon, K. L., & Zetsche, U. (2007). Cognitive inhibition in depression. *Applied and Preventive Psychology*, 12(3), 128-139. doi: 10.1016/j.appsy.2007.09.002

- Kelly, A. E., & Kahn, J. H. (1994). Effects of Suppression of Personal Intrusive Thoughts. *Journal of Personality and Social Psychology*, 66(6), 998-1006.
- Larsen, R. J., Mercer, K. A., & Balota, D. A. (2006). Lexical Characteristics of Words Used in Emotional Stroop Experiments. *Emotion*, 6, 62-72.
- Maccallum, F., & Bryant, R. A. (2010). Attentional bias in complicated grief. *Journal of Affective Disorders*, 125(1-3), 316-322. doi: 10.1016/j.jad.2010.01.070
- Maurage, P., Joassin, F., Speth, A., Modave, J., Philippot, P., & Campanella, S. (2012). Cerebral effects of binge drinking: Respective influences of global alcohol intake and consumption pattern. *Clinical Neurophysiology*, 123(5), 892-901. doi: 10.1016/j.clinph.2011.09.018
- Michael, S. T., & Snyder, C. R. (2005). Getting unstuck: the roles of hope, finding meaning, and rumination in the adjustment to bereavement among college students. *Death Studies*, 29(5), 435-458. doi: 10.1080/07481180590932544
- Mikulincer, M., Dolev, T., & Shaver, P. R. (2004). Attachment-related strategies during thought suppression: ironic rebounds and vulnerable self-representations. *Journal of Personality and Social Psychology*, 87(6), 940-956. doi: 10.1037/0022-3514.87.6.940
- Mikulincer, M., & Shaver, P. R. (2008). An attachment perspective on bereavement. In M. S. Stroebe, R. O. Hansson, H. Schut & W. Stroebe (Eds.), *Handbook of bereavement research and practice: Advances in theory and intervention* (pp. 87-112). Washington, DC: American Psychological Association.
- Morina, N. (2011). Rumination and avoidance as predictors of prolonged grief, depression, and posttraumatic stress in female widowed survivors of war. *The Journal of Nervous and Mental Disease*, 199(12), 921-927. doi: 10.1097/NMD.0b013e3182392aae
- Nolen-Hoeksema, S. (2001). Ruminative coping and adjustment to bereavement *Handbook of bereavement research: Consequences, coping, and care*. (pp. 545-562): Washington, DC, US: American Psychological Association.
- Nolen-Hoeksema, S., & Larson, J. (1999). *Coping with loss*. Mahwah, NJ: Erlbaum.
- Nolen-Hoeksema, S., McBride, A., & Larson, J. (1997). Rumination and psychological distress among bereaved partners. *Journal of Personality and Social Psychology*, 72(4), 855-862.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, 61(1), 115-121.

- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology*, 67(1), 92-104.
- O'Connor, M. F., Wellisch, D. K., Stanton, A. L., Eisenberger, N. I., Irwin, M. R., & Lieberman, M. D. (2008). Craving love? Enduring grief activates brain's reward center. *Neuroimage*, 42(2), 969-972. doi: 10.1016/j.neuroimage.2008.04.256
- Oberauer, K. (2001). Removing Irrelevant Information from Working Memory: A Cognitive Aging Study with the Modified Sternberg Task. *Journal of Experimental Psychology: Learning Memory and Cognition*, 27(4), 948-957. doi: 10.1037//0278-7393.27.4.948
- Prigerson, H. G., Horowitz, M. J., Jacobs, S. C., Parkes, C. M., Aslan, M., Goodkin, K., . . . Maciejewski, P. K. (2009). Prolonged grief disorder: Psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Medicine*, 6(8). doi: 10.1371/journal.pmed.1000121
- Prigerson, H. G., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: A rationale, consensus criteria, and a preliminary empirical test. In M. S. Stroebe, R. O. Hansson, W. Stroebe & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 613-645). Washington, DC, US: American Psychological Association, Washington, DC.
- Prigerson, H. G., Shear, M. K., Jacobs, S. C., Reynolds Iii, C. F., Maciejewski, P. K., Davidson, J. R. T., . . . Zisook, S. (1999). Consensus criteria for traumatic grief: A preliminary empirical test. *British Journal of Psychiatry*, 174(JAN.), 67-73.
- Shear, K., Frank, E., Houck, P. R., & Reynolds, C. F., 3rd. (2005). Treatment of complicated grief: a randomized controlled trial. *JAMA*, 293(21), 2601-2608. doi: 10.1001/jama.293.21.2601
- Silver, R. L., Boon, C., & Stones, M. H. (1983). Searching for meaning in misfortune: Making sense of incest. *Journal of Social Issues*, 39, 81-102.
- Stroebe, M., Boelen, P. A., van den Hout, M., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance: a reinterpretation of its function in adjustment to bereavement. *European Archives of Psychiatry and Clinical Neuroscience*, 257(8), 462-472. doi: 10.1007/s00406-007-0746-y
- Stroop, J. R. (1938). Factors affecting speed in serial verbal reactions. *Psychological Monographs*, 50(5), 38-48. doi: 10.1037/h0093516
- Syssau, A., & Font, N. (2005). Évaluations des caractéristiques émotionnelles d'un corpus de 604 mots. *Bulletin de psychologie*, 58(3), 361-367.

- Tait, R., & Silver, R. C. (1989). Coming to terms with major negative life events. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 351-382). New York: Guilford.
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, 27(3), 247-259. doi: 10.1023/a:1023910315561
- van der Houwen, K., Stroebe, M., Schut, H., Stroebe, W., & van den Bout, J. (2010). Mediating processes in bereavement: the role of rumination, threatening grief interpretations, and deliberate grief avoidance. *Social Science and Medicine*, 71(9), 1669-1676. doi: 10.1016/j.socscimed.2010.06.047
- Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review*, 101(1), 34-52.
- Wegner, D. M., & Gold, D. B. (1995). Fanning Old Flames: Emotional and Cognitive Effects of Suppressing Thoughts of a Past Relationship. *Journal of Personality and Social Psychology*, 68(5), 782-792.
- Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical Effects of Thought Suppression. *Journal of Personality and Social Psychology*, 53(1), 5-13.

Chapter 5 – General discussion

1. Summary of the studies and their related results

1.1. Why do grief reactions persist? The meditational influence of negative appraisals and inflexible coping on the relation between attachment insecurities and severe grief

In line with the need to investigate the risk factors but also the cognitive processes underlying severe grief symptomatology, a first study was conducted (see Chapter 2). The purpose of this study was specifically to focus on the cognitive processes that mediate the link between a core risk factor, attachment insecurities, and grief symptomatology. Investigated in particular, was the extent to which the appraisal, as well as the oscillation process between LO and RO coping strategies mediated the influence of both anxious and avoidant dimensions of attachment on grief reactions.

In line with attachment theory (for a review, see Mikulincer & Shaver, 2008) as well as the *dual process model of coping with bereavement* (DPM) (M.S. Stroebe & Schut, 1999, 2010; M. S. Stroebe, Schut, & Stroebe, 2005), it was predicted that individuals with higher attachment anxiety would exhibit more negative appraisals of LO and RO stressors, conduct primarily LO coping strategies, and show increased grief reactions. In striking contrast, it was predicted that individuals with higher attachment avoidance would exhibit lower negative appraisal of LO and RO stressors, conduct primarily RO coping strategies and show lower levels of grief reactions.

To test our hypotheses, 321 participants filled in an online questionnaire. This questionnaire assessed background and loss-related variables, attachment to the deceased partner, grief-related reactions, appraisal of LO and RO stressors as well as oscillation between LO and RO strategies. To examine whether both negative appraisal and oscillation mediated the effects of the attachment dimensions on grief adjustment, meditational analyses were performed following the procedure outlined by (MacKinnon, Fairchild, & Fritz, 2007).

In line with our predictions, results first showed that the anxious and the avoidant dimension were respectively positively and negatively associated to grief symptomatology. These results confirmed that individuals who present higher levels of attachment anxiety are much more prone to develop severe grief symptomatology. However, while our results also confirmed that individuals who present higher levels of attachment avoidance were prone to develop limited grief symptomatology, their related interpretations have to be

taken cautiously. Marked reduction of grief reactions on the ITG measure could, indeed, be associated either to patterns of resilience, or to those of inhibited grief, theorized in the bereavement literature as a complicated type of grief (e.g., Bowlby, 1980). With regard to the mediational analyses, our results showed that the anxiety dimension was positively correlated to negative appraisal of bereavement-related stressors when controlling for the avoidance dimension. In line with previous research (e.g., P. A. Boelen & Klugkist, 2011; P. A. Boelen & J. Van Den Bout, 2010; Field & Sundin, 2001), these results provide interesting findings for future investigations (this will be discussed below). Yet, there was no link found between the anxiety dimension and the oscillation process even when controlling for the avoidance dimension. Thus, the mediating role of negative appraisal and oscillation processes between anxiety dimension of attachment and grief severity was not supported. In terms of the avoidance dimension, our results confirmed that the relation between avoidance dimension and grief reactions was mediated by a reduced negative appraisal of LO and RO stressors as well as a reduced oscillation score, pointing towards an inclination for the use of RO coping strategies rather than LO strategies.

The absence of link between the anxiety dimension and the oscillation process has been primarily explained by the fact that the coping strategies were defined and operationalized as voluntary and controlled processes (e.g., “I take time to think about the deceased person”) (cf. the DPM; M.S. Stroebe & Schut, 2010). Yet, previous research has shown that the anxiety dimension was associated with a lack of control in emotional processing. For example, Mikulincer and Orbach (1995) showed that anxiously-attached individuals had faster access to targeted painful memories and found these memories to spread like “wildfire” throughout their cognitive system. In line with these results, it has been suggested that processing tendencies of certain individuals with a high score of attachment anxiety could hamper or deregulate effective coping strategies (e.g., calm exploration of the death’s meaning without being overwhelmed by intrusive and uncontrolled distressing thoughts). Accordingly, it has been suggested that bereaved individuals with high anxiety may be less inclined to primarily develop LO coping strategies rather than passive intrusion of grief or insistent preoccupations with the deceased, which could in turn explain the absence of association between the anxious dimension and the bereavement-related coping strategy construction.

In complement to this first explanation, it was also mentioned that anxiously-attached individuals have been theoretically linked with rumination, a passive process of thought repetition and preoccupation focused on the loss and the deceased (M. S. Stroebe et al.,

2005). Interestingly, rumination has been strongly associated with maladjustment to grief (for a review, see M.S. Stroebe et al., 2007). Our suggestion was thus that future research should examine whether the connection between the anxious dimension of attachment and severe grief reactions might be mediated by persistent passive intrusions or rumination rather than controlled coping strategies.

As explained in the introduction of the present thesis, persistent rumination (e.g., negative affect/appraisals) has been precisely suggested in the DMP (M.S. Stroebe & Schut, 2010; M. S. Stroebe et al., 2005) to be a maladaptive cognitive process that could underlie and maintain grief symptomology. Accordingly, we decided to conduct a second study which was primarily focused on the investigation of rumination (Chapter 3).

Before testing in particular whether the connection between the anxious dimension of attachment and severe grief reactions might be mediated by persistent rumination as suggested in the first study's discussion, we first aimed to examine why rumination might remain persistent. In the same line of reasoning described earlier (see Zech, Ryckebosch-Dayez, & Delespaux, 2010), it seemed important to first investigate the processes that could underlie the development and the maintenance of maladaptive rumination.

1.2. Why do bereaved individuals experience prolonged rumination? An investigation of its underlying processes

With regard to the underlying processes of maladaptive rumination, a recent line of research has suggested that deficits in cognitive inhibition might explain the development and the maintenance of persistent rumination. Cognitive inhibition is supposed to be responsible for two crucial processes required for effectively manipulating information into working memory (WM). The first consists of the access limitation of irrelevant information into WM and the second rejecting or updating information that is no longer relevant in WM (Hasher, Zacks, & May, 1999). In line with this perspective, existence of deficits in inhibitory processes should allow intrusive thoughts to enter WM as well as preclude henceforth irrelevant thoughts from being deactivated. The resulting inability to control the contents in WM should prevent the maintenance of a coherent stream of consciousness and favor the appearance of unintended and widespread recurring thoughts that characterize rumination (Joormann, 2010).

With regard to the first process (i.e., access limitation), previous studies on the depression area have found that rumination typically involves enhanced access of mood-congruent material in WM (e.g., depressed participants with elevated rumination presented

reduced inhibition for negative material in contrast with positive material) (Joormann, 2006; Joormann, Yoon, & Zetsche, 2007). Because rumination is thought to be a transdiagnostic process, our aim was to test in the second study whether bereaved individuals with elevated rumination would present deficit in the active inhibitory processes that keep “irrelevant” information from entering WM. According to the fact that bereaved ruminators are extensively focused on thoughts related to the death and the deceased (M.S. Stroebe et al., 2007), we expected them to be more easily distracted/intruded by grief-related stimuli than by general negative one (as it was shown in Joormann’s research). To be precise, it was hypothesized that bereaved individuals with high rumination compared with bereaved individuals with low rumination might show a deficit in the inhibition of instructed to-be-ignored information that was related to grief compared to negative and positive information. Finally, given that inhibitory deficits have been found in the depression-oriented literature to be associated to elevated rumination even after controlling for differences in level of depression (e.g., Davis & Nolen-Hoeksema, 2000; Joormann, 2006), we predicted that inhibitory deficits in grief-related information would be associated to a tendency to ruminate irrespective of differences in current grief reactions.

To test our hypotheses, participants with extreme scores of rumination (low and high on the Ruminative Response Scale; Nolen-Hoeksema & Morrow, 1991) were compared when processing three types of words (grief-related, positive, and negative). A negative affective priming task (NAP) was used to assess individual differences in the access limitation of to-be-ignored materials into WM.

Results of this second study provided data showing interesting interaction between the to-be-ignored type of word and the rumination group. More specifically, higher rumination was shown to be associated to lower NAP effects when processing grief-related information whereas no association was observed when processing positive information. Consistent with our hypothesis, these results suggested that the tendency to ruminate after the loss of a significant person was associated to inhibition deficits when grief-related information has to be ignored in comparison to positive information.

In addition to these findings, the present study also showed that higher rumination was associated with lower NAP effects when the to-be-ignored information was grief-related, but not when the to-be-ignored information was negative. Consistent with our hypothesis, these findings suggested that bereaved individuals with higher rumination present inhibition deficits for specific grief-related but not for negative irrelevant information.

Finally, whereas the association between rumination and inhibitory deficits was expected to remain significant even after controlling for grief reactions scores, the present study showed that differences in grief reactions scores accounted for variations in NAP effect too. Accordingly, while the tendency to ruminate in response to negative mood states and inhibitory dysfunctions in WM were shown to be associated, the results did not provide evidence for a direct link between inhibition and rumination among bereaved individuals (this will be further discussed below).

While all of the hypotheses were not completely confirmed, the results of our second study have interestingly shown that bereaved individuals who frequently ruminate in response to sad feelings (cf. the instructions of the RRS questionnaire) are less able than their low ruminator counterparts to prevent grief-related from entering their stream of consciousness. Accordingly, it has been concluded that the ability to control the contents of WM could be crucial in understanding why some bereaved individuals remain trapped in recurring recycling of thoughts.

This second study's conclusion provided notable information with regard to the cognitive processes which could explain the occurrence and the perpetuation of persistent rumination after the loss of a significant person. However, questions remained. Indeed, in this study, we used the RRS, which is a measure of the rumination process associated to the experience of sad mood in general (i.e., the bereavement situation in not directly mentioned). Subsequently, the observed deficits have to be understood with regard to rumination in general vs. specific to bereavement-related thoughts. One might still wonder about the cognitive process that could underlie the rumination process that is specific to bereavement-related thoughts. In addition, in the study, only the process of access limitation was investigated. As the efficient manipulation of information into WM not only depends on access limitation but also on the rejection/suppression of information that is no longer relevant, further investigation of this second crucial process remained to be necessary.

This has led to the development of a third study (Chapter 4). In this study, the relationship between the specific deficits in the ability to expel/suppress no-longer relevant emotional information and elevated bereavement-related rumination was investigated. According to Joormann (2010)'s model, we suggested that the inability to expel/suppress a painful grief-related thought from WM would preclude these contents from being deactivated which in turn would lead to an increased processing of such a thought (and connected concerns), as well as subsequent persistent bereavement-related rumination.

Accordingly, we have hypothesized that bereaved individuals with a high rumination level would be less able to suppress grief-related and negative information than bereaved individuals with a low rumination level, and this after being told to reactivate a negative painful grief-related thought. In addition, it was hypothesized that bereaved individuals with high levels of rumination would be less able to suppress grief-related and negative words than positive and neutral words.

To test our hypotheses, conjugally-bereaved participants with extreme scores of bereavement-related rumination (low and high on the Rumination Index Questionnaire; Michael & Snyder, 2005) were asked to perform a 5-min stream-of-consciousness task in which they were instructed to think about anything except the 3-min previously activated painful thoughts, feelings, and memories about the loss and the deceased (cf. Wegner's thought-suppression paradigm; Wegner, Schneider, Carter, & White, 1987). At the end of the 5-min period, participants were asked to perform an emotional Stroop task (cf. Stroop, 1938) with grief-related, positive, negative and neutral words. The implicit rebound of previously suppressed grief-related thoughts was assessed by measuring the extent to which performance on the Stroop task with grief-related, negative, positive, and neutral words was influenced.

Results of this third study provided data showing interesting interaction between the type of word presented in the Stroop task and the rumination group. More specifically, bereaved individuals in the high RIQ group showed a tendency to be slower when color naming grief-related, negative, and positive words in comparison with bereaved individuals with low rumination. No difference was found between groups when color naming neutral words. In addition, the study showed that bereaved individuals with high rumination tended to be slower to respond to negative words rather than grief-related and neutral words.

In line with the postulation of a link between persistent rumination and deficits in WM updating, results of the third study suggested that bereaved individuals who frequently ruminate were less able to control the activation of grief-related, negative, and positive representations after being told to suppress a painful grief-related thought. In addition, they appeared less able to control the activation of negative representations in comparison to grief-related and neutral ones.

For most part, supporting our hypotheses, some of these results were, however, not expected. First, the fact that bereaved individuals with high rumination were less able to suppress/control the activation of positive representations was quite surprising. Second,

the fact that bereaved individuals with higher rumination were less able to suppress/control activation of negative representation in comparison with grief-related ones was also surprising.

While at first unexpected, these results have been further explained according to recent evidence in the bereavement field. First of all, the suppression deficit for positive representations has been mainly explained by the fact that repetitive thoughts in the specific situation of grief might include grief-related and negative contents but also positive ones (e.g., pleasant memories shared with the beloved deceased). Hence, if bereaved individuals with elevated rumination are asked to reactivate a grief-related thought that includes various emotional aspects with regard to the loss (including positive ones), it is not surprising to then observe deficits in the suppression of grief-related and negative contents but also positive ones. Second, the fact that negative representations appear to be more difficult to suppress in comparison with grief-related ones has been explained by recent formulation which has suggested that the rumination process is associated with avoidance of the reality of the loss (M.S. Stroebe et al., 2007). Specifically, recurrent rumination is suggested to focus on one's negative emotions and the possible cause and consequences of these emotions but without directly elaborating the reality of the death. To prevent the direct elaboration of the death, bereaved ruminators are suggested to chronically use cognitive avoidant strategies (e.g. thought suppression) (P. A. Boelen, van den Bout, & van den Hout, 2003, 2006). The recurrent use of such strategies might lead in turn to more developed abilities in the control of the specifically avoided thoughts (i.e., the reality of the death). As a result, when asking to suppress a painful grief-related thought, bereaved individuals with high rumination could be less able to suppress their reactivated general negative representations than their grief-related ones.

Last but not least, when controlling for grief reactions scores, the rumination by type of word interaction was no longer significant. Accordingly, the results did not provide evidence for a direct link between inhibition and rumination among bereaved individuals. These unexpected results, in line with those of the second study, will be further discussed below.

1.3. Evidence for deficits in access limitation and suppression

To sum up, the third study added completion to the former one (study 2) in that both of them have shown a link between rumination and specific **cognitive inhibitory processes: access limitation** (study 2) and **WM updating** (study 3). Added up, results of

both studies could be summarized as follows. In the presence of to be ignored grief-related, negative and positive cues elevated rumination (RRS) is associated with deficits in access limitation of specific grief-related information (study 2). Also, when painful grief-related thoughts are actually reactivated in WM and later tried to be suppressed, elevated bereavement-related rumination (RIQ) appears to be associated with deficits in the suppression of grief-related, negative but also positive representations, including a more pronounced deficit for negative ones (study 3).

In addition to the fact that in both studies, no direct link between rumination and the observed deficits has been shown (this will be discussed below), a major theoretical question had to be discussed before concluding. Two different measures of rumination have actually been used in Study 2 and Study 3 (i.e., the RRS and the RIQ respectively). While both measures are presented in the bereavement literature as capturing similar ruminative processes (with a more specific focus on bereavement-related thoughts in the second measure), when items from both were compared, it felt less certain that they would assess the same construct (see Appendix 10.).

Actually, while the RRS could be viewed as capturing more abstract pervasive thinking - namely representing the reasons why an action is preformed or an event occurred, its meanings and implications, and elements that are common across multiple situations (Watkins & Moulds, 2013) - , the RIQ could be seen as capturing more concrete - namely involving contextual and sensory specific details or emotionally vivid imagery - intrusive/involuntary and distressful thoughts of grief. Given the potential differences between both measures, further examination of the rumination concept is then needed. The aim being to elucidate whether the observed inhibitory deficits of studies 2 and 3 might be integrated in a single model of rumination (as it was done in the last paragraph) or whether they have to be interpreted according to two different processes of rumination.

In the next few paragraphs, we will aim to examine the RRS and the RIQ measures specifically. This will lead to determine whether the RRS and the RIQ would assess comparable cognitive processes or not.

2. Do the RRS and the RIQ assess comparable cognitive processes?

On the basis of the reviewed descriptions, as well as the assessment tools of rumination introduced in Chapter 1 (see also Appendix 1), we can observe that the RRS and the RIQ both assess quite distinct features of the ruminative process (e.g., among

others, abstract vs. concrete, confrontational vs. avoidant processing, voluntary vs. involuntary processing). For example, in the RRS, items relatively involve abstract processing which is conceptualized as a form of avoidance (Watkins & Moulds, 2013). In the same way, the items do not seem directly linked to the reality of the death (cf. its non-bereavement-related items) which is also conceptualized as a form of avoidance (M.S. Stroebe et al., 2007). As a result, the repetitive thinking measured with the RRS is suggested to capture an avoidance process. Such a process could be understood at first as a voluntary one (because it has perceived or actual functions) but which could finally develop as an automatic and uncontrolled process (due to negative reinforcement by the removal of aversive experience).

Conversely, compared to the RRS, in the RIQ, more concrete and thus confrontational kinds of thoughts are measured (Watkins & Moulds, 2013). In RIQ, the repetitive thought does indeed appear directly linked to the reality of the death and its particular details (cf. the distressing level of the grief-related intruded thoughts). In addition, compared to the RRS, in the RIQ, more intrusive and at the time uncontrolled kind of thought is measured. Accordingly, this process could be categorized as a confrontational one and considered to be quite involuntary.

In addition, while the RRS was used in several longitudinal studies, the RIQ was used only in one cross-sectional study. Yet, even if strongly presented as a maladaptive process (i.e., proximal risk factor) (e.g., M.S. Stroebe et al., 2007), rumination can also be understood as a grief symptom (see Chapter 1). Consequently, while rumination assessed by the RRS can be seen as a risk factor for severe grief symptomatology, the rumination assessed by the RIQ can be seen as either risk factor of grief maladjustment or as a pattern of grief reactions (i.e., intrusions of grief). This has to be taken into consideration when considering the results of study 3.

According to the former analyses, it seems as if the RRS and the RIQ do not measure comparable types of repetitive thoughts: while the RRS would assess a maladaptive process that is mostly avoidant and somewhat involuntary, the RIQ would assess a maladaptive process or a symptom that is excessively confrontational and fully involuntary. Given such a distinction, we propose to conclude that the processes measured by the RRS and the RIQ are not equivalent. Consequently, the deficits in cognitive control observed in studies 2 and 3 should not be interpreted as related to a similar thought-process as it previously was. In striking contrast, the observed deficits should be interpreted in relation with two different processes of repetitive thoughts (see below).

In Chapter 1, discrepancies in repetitive thoughts definition have been highlighted. This has led to distinguish two types of repetitive thinking: a first type of thought is “mental rumination” which corresponds to the repetitive and the passive focus on one’s own negative emotions or symptoms of distress and on the possible causes and consequences of these emotions and symptoms (Nolen-Hoeksema, 2001). In contrast, a second type is “intrusions” which correspond to highly distressing thought that intrude in the person’s mind without his or her will. Accordingly, while the RRS seems to assess mental rumination, the RIQ appears to capture intrusions. For better comprehension, and in accordance with the distinction recommended in Chapter 1, we will refer to mental rumination when examining the results related to RRS and intrusions when examining the results related to RIQ.

3. When the measured processes of the RRS and the RIQ have to be distinguished: A refined interpretation of studies 2 and 3 results

The previous interpretations of the Study 2 and Study 3 effects could be refined and summarized as follows (see also Table 1.). With regard to the second study (using the RRS), results suggested that bereaved people who are mostly inclined to focus on negative emotions and their possible implications (cf. mental rumination) presented higher difficulties in controlling the access of grief-related information/distractor. In other words, results suggested that bereaved individuals who reported higher levels of mental rumination are more easily intruded by grief-related (in this case, external) distractors.

Table 1. *Summary of the results*

	Type of repetitive thought	
	Mental rumination Abstract thinking (avoidance)	Intrusions Concrete thinking (confrontation)
Inhibitory processes		
Access limitation	Study 2 (RRS) Deficit in the access limitation of grief-related vs. negative and positive information/external distractor	-
Updating/suppression	-	Study 3 (RIQ) After the suppression of a previously activated painful grief-related thought, rebound effect for grief-related, negative and positive vs. neutral information with a specific higher rebound of negative information

Note. RRS = Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991); RIQ = Rumination Index Questionnaire (Michael & Snyder, 2005)

With regard to the third study (using the RIQ), results suggested that the bereaved individuals who experience higher levels of intrusive and distressful ideations related to the death (i.e., intrusions) presented higher difficulties to suppress grief-related, negative and positive representations - with a more pronounced deficit for negative ones - after being emotionally reactivated by a painful grief-related thought. Accordingly, it seems as if the bereaved individuals who report higher levels of intrusions are those who present higher rebound effects of (or are less able to escape from) grief-related, negative, and positive representations when painful grief-related thoughts are recalled.

These last results are in line with the model of (Ehlers & Clark, 2000) or (M. J. Horowitz, Bonanno, & Holen, 1993) which suggests that intrusive thoughts continually come back. Moreover, these results replicated the findings of Friedman and Miyake (2004) which have shown that impaired resistance to proactive interference (that is the equivalent of suppression or updating processes) predicted unwanted intrusive thoughts frequency. However, the observation of higher difficulties to suppress negative representations in comparison with grief-related ones once again appears quite surprising. While the proposition of an avoidance function related to the specific process of repetitive thought

has been previously used to explain such a result (see chapter 4), this justification is non-lastingly appropriate regarding to the actual process at hand (i.e., intrusions). While first confounded with an avoidant process in previous justifications, we now certainly argue that the process measured by the RIQ is a highly confrontational one. Accordingly, intrusions should be characterized by more painful grief-related content rather than general negative one. This should in turn be linked to higher recrudescence of grief-related representations in comparison with negative ones. Results have however shown the opposite.

One possible reason for stronger difficulties in negative representations suppression in comparison with grief-related representations could be a higher activation of negative representations in comparison with grief-related ones during the activation period (as a reminder, the activation period consisted in writing a painful recalled thought related to the deceased death). Intrusions are indeed suggested to be associated with ongoing mechanisms of avoidance (M. J. Horowitz et al., 1993). Accordingly, the bereaved individuals with elevated intrusions might have reactivated more indirect (i.e., abstract) grief-related representations, which are poorly connected with direct grief-related concerns but still remain negative, and this as a means to avoid the reality of the loss. Future studies should develop designs in which the actual “dose” (M. J. Horowitz et al., 1993) of emotional information that is cognitively processed during the activation period is better controlled.

4. Do the different types of repetitive thought coexist as underlying processes of grief complications?

While distinguished according to the specific measured process of repetitive thought, we could wonder whether the processes investigated in study 2 and 3 might be both considered as belonging to a single sequence of different types of maladaptive grief processing or not. In a recent publication of (Maccallum & Bryant, 2010) both processes of rumination and intrusions have been mentioned as if coexisting into a single model of pathological grief (i.e., PGD). Based upon the new conceptualizations of PGD, formulations of (Maccallum & Bryant, 2010) can be reported as follows.

It is first projected that PGD symptoms become marked and persistent, in part due to insufficient emotional processing of the loss (P.A. Boelen, van den Hout, & van den Bout, 2006; Shear & Shair, 2005). When the loss actually occurs, strong discrepancy develops between the bereaved person's mental representations about their self, the

deceased, the world, and the reality of the death. Accordingly, the previous representations have to be cognitively updated. This mismatch between established mental representations of attachment and the actuality of the death leads to greater occurrence of intrusive thoughts and attention to loss-related events (see also, Dalgleish & Power, 2004). During periods of intrusions, the thoughts provoke anxious feelings that are so overwhelming that the person tries to avoid them (for example through thought suppression or rumination).

In addition to this, and according to theorists of grief, it is also proposed that PGD reactions persist when individuals engage in avoidance behaviors (e.g., P.A. Boelen et al., 2006; Shear et al., 2007; Shear & Shair, 2005). Avoidance is indeed thought to impede habituation to painful memories and interfere with the integration of the loss into pre-existing schemas (P.A. Boelen et al., 2006; Ehlers & Clarke, 2000; Foa & Kozak, 1986; M.J. Horowitz, 1986; Shear et al., 2007; Shear & Shair, 2005). In the case of bereavement, avoidance may involve behavioral but also cognitive avoidant strategies, such as thought suppression and mental rumination.

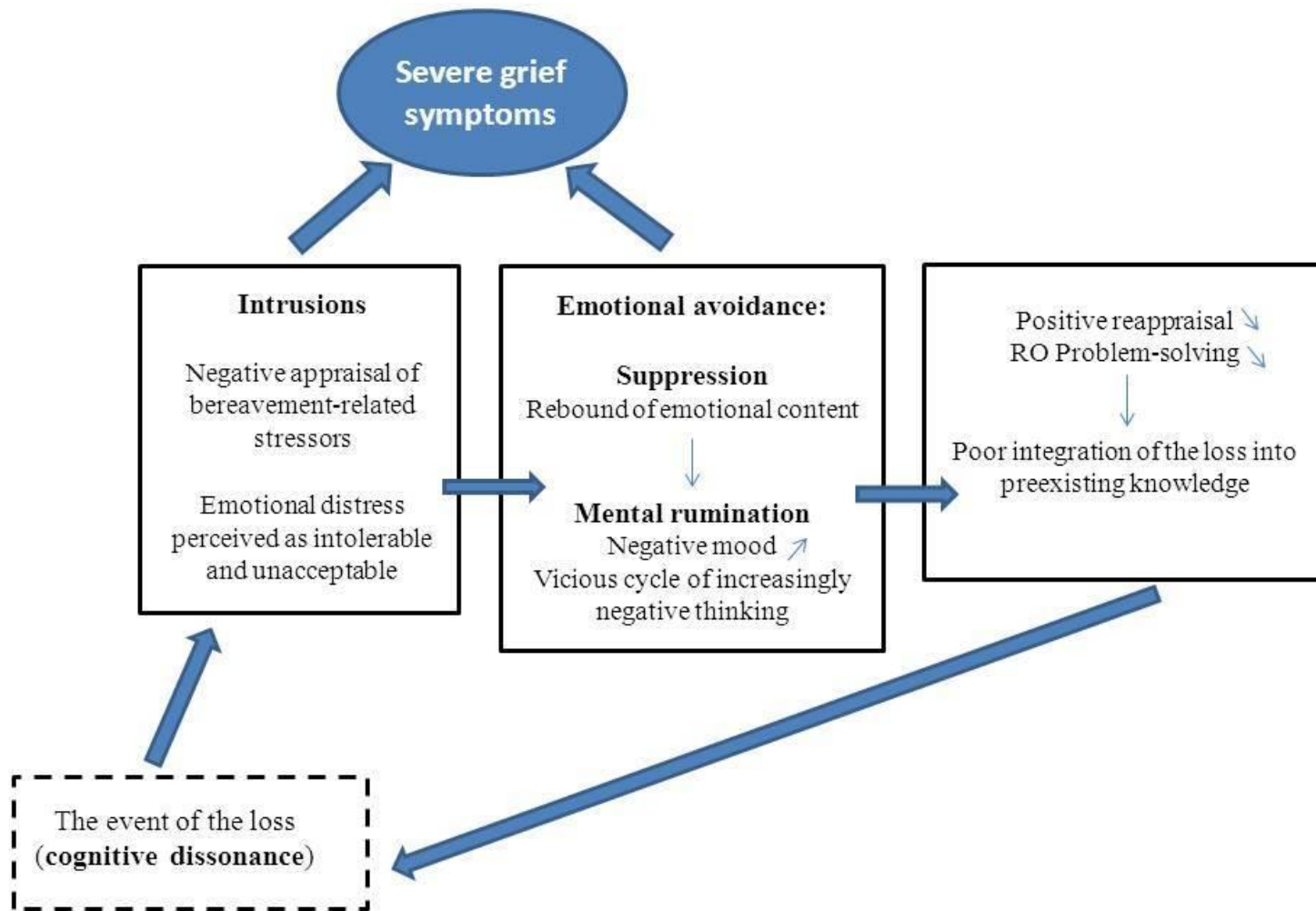
As depicted, the formulations of Maccallum and Bryant (2010) interestingly mention both rumination and intrusions as two different types of coexisting maladaptive grief processing. Accordingly, even if we have previously insisted on the distinction between the ruminative processes investigated in studies 2 and 3, it seems as though the respective results provide stimulating information with regard to processes that each co-contribute to the development and the maintenance of severe grief symptoms.

5. A self-defeating cycle of different type of maladaptive repetitive thought: a refinement of Maccallum and Bryant (2010) formulations

Even if Maccallum and Bryant (2010) have both mentioned ruminative processes when describing their model of PG, all of the involved components have not yet been described in terms of a sequential process. However, the description of a sequential process could help in understanding how PGD might develop and perdure (the core aim of the present thesis). In the following point, we aim to present a refined model (see Figure 1.) which includes both types of repetitive thinking into a single sequence of processes that should turn into, when initiated, a self-defeating cycle of maladaptive reactions, finally leading to the development and the maintainance of PG. Based on the previous developments of the present discussion, on the latest Maccallum and Bryant (2010)

formulations, but also on a more general model of emotional distress persistence (Barlow & Allen (2007) (see below), this model can be summarized as follows.

Figure 1. Self-defeating cycle of different types of maladaptive repetitive thought, leading to severe grief symptoms (PGD)



The mismatch between established mental representations of attachment and the actuality of the death, namely cognitive dissonance, leads to greater occurrence of intrusive thoughts. In the case of what individuals risk for PGD, the thoughts provoke psychological distress that is so overwhelming that the person tries to avoid them. Avoidance can for example be achieved through thought suppression/updating processes. However, intrusions are associated to difficulties in the suppression of grief-related, negative and positive representations (cf. study 3). Such residual information in WM could favor the initiation of another avoidant strategy that is mental rumination. Rumination is however thought to be associated with higher accessibility of grief-related information into WM (cf. study 2). Such incursions should in turn maintain the disruption of the person's coherent stream of thoughts, prevent negative mood/state of mind from being repaired⁶ and further initiate a vicious cycle of increasingly negative thinking.

When experienced in an expansive way (i.e., intensity/frequency), such avoidant strategies might progressively turn out to be symptoms of grief (e.g., distressing intrusions of grief (Horowitz et al., 1993), pervasive rumination (Shear et al., 2011)). More importantly, they also prevent the adaptive emotional processing of the loss – by interfering with positive reappraisal, RO problem-solving – which results in a failure to update the previous schemas (i.e., the loss is not integrated in existing autobiographical knowledge) (P.A. Boelen et al., 2006; Shear & Shair, 2005; M.S. Stroebe et al., 2007). Accordingly, strong discrepancy develops between the bereaved person's mental representations about their self, the deceased, the world, and the reality of the death. The ongoing poor elaboration of the loss leads to a higher occurrence of distressing intrusions

⁶ According to Joormann (2010), ruminators and non-ruminators may not differ much in their initial response to a negative event, but instead differ in the degree to which they are able to repair their mood once they experience sadness or other negative emotions. Negative mood has generally been associated with the activation of mood-congruent representations in working memory (Siemer, 2005). Negative mood is thus related to more frequent negative thoughts, selective attention to negative stimuli, and greater accessibility of negative memories. It has also been shown, however, that such changes in cognition due to negative mood are usually transient; mood-congruent cognitions are often replaced quite quickly by thoughts and memories that serve to regulate and repair the mood state (Siemer, 2005). Accordingly, Joormann (2010) suggested that the ability to control the activation of mood-congruent material in working memory would play an important role in recovering from negative affect.

(Ehlers & Clarke, 2000; M. J. Horowitz et al., 1993) which completes the vicious cycle. This finally leads to persistent PG.

It is worth notifying that we have referred to Barlow and Allen's (2007) model to apprehend why intrusion leads to avoidance. In their model of distress persistence, Barlow and Allen (2007) suggest that it is because the emotional experience (in this case related to the loss) is appraised as being **intolerable** and **unacceptable** that avoidance strategies are developed. Such appraisals have consequently been included in the present model.

Finally, we intend to underline that engagement in avoidance has been proven to importantly contribute to the persistence of PGD (e.g., P.A. Boelen et al., 2006; Shear et al., 2007; Shear & Shair, 2005). Avoidance is indeed thought to impede habituation to painful memories and interfere with the integration of the loss into pre-existing schemas (P.A. Boelen et al., 2006; Ehlers & Clarke, 2000; Foa & Kozak, 1986; M.J. Horowitz, 1986; Shear et al., 2007; Shear & Shair, 2005). Accordingly, even if cognitive inhibition appears to be an important underlying process of PGD, extensive avoidance also needs to be considered. While the present thesis supports such a model, it needs to be empirically validated more thoroughly, mostly with regard to the specific sequence of processes.

5.1. Direction for future research

In the introduction, other inhibition-related functions than information monitoring and updating (corresponding, in the present thesis, to access limitation and WM updating) have been raised, that is for example mental set shifting. This latter inhibition-related function is defined as the ability of shifting back and forth among multiple tasks, operations, or mental sets (Miyake et al., 2000). Yet, deficits in set switching could impair the ability to switch from a current conceptual set to another one. Hence, switching attention from the mental set associated with ruminative thoughts to a new mental set may be difficult for bereaved individuals who tend to ruminate. Accordingly, repetitive process of thinking and then PGD might develop due to deficits in the information monitoring and updating on the one hand, but also because of deficits in mental set shifting (e.g., from negative LO to positive LO or negative/positive RO) on the other hand. This should be tested in future research.

6. When rumination (RRS and RIQ) and ITG reactions were both shown to explain the observed cognitive deficits: Further considerations

In the present empirical studies, intrusions and mental rumination were observed to be highly associated with grief severity (ITG), $r(50) = .81, p < .001$ (study 3) and $r(61) = .78, p < .001$ (study 2) respectively. However expected, such correlations appear very high. As a result, the link between rumination/intrusions and deficits in cognitive inhibition was no longer found to be significant when the grief reactions scores were introduced into the analyses. These results suggested that grief reactions might account for variations in cognitive deficits too but also (and more likely) that the repetitive thought scales and ITG capture a similar phenomenological experience. After further considerations, we reported that some of the item content of the RRS and the RIQ scales appeared to overlap with item content on ITG and vice versa. Accordingly, the observed absence of a direct link between repetitive thought processes and inhibition deficits may not be due to a fundamental correlation between the two constructs but in reality to the shared items. This overlap in item content raises an important question: does a correlation between rumination and grief severity suggest a link between cognitive style and emotion, or is the correlation artifactual because the scales capture identical phenomenological experience? Such a core question should be addressed in future studies. For example, the active ingredients of intrusions and mental rumination in maladaptive grief processing should be isolated with exploratory analysis and structural equation modeling. Similarly, the discriminative validity of items related to cognitive processing should be further tested in the ITG.

Beyond these considerations, one could question whether deficits in cognitive inhibition - or other types of dysfunctional cognitive processing - would be directly associated with PGD. Preliminary confirmation of a link between specific cognitive process (i.e. attentional bias) and PGD has been found in (Maccallum & Bryant, 2010). Specifically, PGD participants were shown to present attentional bias toward death-related words - i.e. the preferential processing of or the difficulty in disengaging attention from information related to the death of a loved one - in comparison with non PGD participants. On the basis of these results we could expect a link between deficits in cognitive inhibition and PGD. Future studies are needed to further investigate such association and that said while

cautiously disentangling the respective relation between cognitive deficits and intrusions/mental rumination on the one hand, and PGD occurrence on the other hand.

7. What about the mediational process of the link between anxious attachment and debilitating grief reactions? Further propositions of investigation

In the first study of the present thesis (Chapter 2), we have shown that the anxious dimension of attachment was associated with more negative appraisal of the bereavement-related stressors as well as more severe grief reactions. However, no link was demonstrated between the anxious dimension of attachment and the oscillation coping process. Thus, the mediating role of negative appraisal and oscillation process between anxious dimension of attachment and grief severity was not supported. This unexpected result has led to suggest that the link between anxious dimension of attachment and severe grief symptoms could be mediated by “uncontrolled and overwhelming processes” such as what it was called rumination as opposed to the controlled coping strategies depicted in the DPM.

Following this suggestion, and given the fact that both mental rumination and intrusions processes have each been brought forward to underlie the development of more severe grief symptoms (see this Chapter), we could expect that higher attachment anxiety would lead to higher mental rumination and intrusions (also suggested in Mikulincer & Shaver, 2008), which should in turn increase the severity of grief reactions. This should be tested in future studies.

However, according to the results of the Study 1, as well as the components of the refined model of Maccallum and Bryant (2010), further mediational pathways could also be tested in future studies. For example, it might be interesting to test whether higher attachment anxiety could be associated with higher negative appraisal of bereavement-related emotions and reactions (cf. Study 1) which should in turn favor the engagement in avoidance strategies such as thought suppression and rumination (anxious attachment and avoidant strategies have been shown to be linked; see Paul A. Boelen & Jan van den Bout, 2010). Furthermore, such engagement in avoidance strategies would lead to increased occurrence of uncontrolled and overwhelming distressing thoughts (i.e., intrusions) (anxious attachment and higher accessibility of affective memories have been shown to be related; see Mikulincer & Orbach, 1995; Mikulincer & Shaver, 2008), which in turn should lead to the recurrence of the prior avoidance strategies. As a result, the loss would be

poorly processed and accepted which is associated with the development of prospective PGD (anxious attachment has been strongly shown to promote PGD development; for a review, see Mikulincer & Shaver, 2008; M. S. Stroebe et al., 2005).

8. General limitations

Some limitations deserve consideration about the present thesis. Firstly, whereas the investigation of the underlying process of persistent grief reactions (the present main goal) assumes the direction of causality, our cross-sectional data does not enable us to draw conclusions about temporal precedence. Future studies should use a longitudinal design in order to better understand the causal associations involved in the development and the maintenance of severe grief reactions.

Secondly, most of the participants who took part in study 2 and 3 did not show critical levels of grief reactions or rumination. As a consequence, the results of the present work have to be interpreted with caution if tempted to be applied within a clinical population (e.g., bereaved individuals who reach clinical standards for PGD diagnostic). Maybe the underlying cognitive processes of elevated grief are actually not equivalent whether the bereaved individual presents PGD or not. Future studies should include bereaved participants who present acute scores (or pathological level) of grief reactions or rumination.

Thirdly, while cognitive inhibition (access limitation and WM updating) has been assessed through procedures that have been widely used to assess inhibitory mechanisms, the actual targeted processes remain relatively uncertain. For example, though increasingly used in Joormann's studies to assess processes of access limitation (for a review, see Joormann et al., 2007), the NAP task has recently been proposed to assess another process which is the process of suppression (Fournet, Mosca, & Moreaud, 2007). Similarly, whether included into a thought suppression paradigm design or not, the Stroop task used during the rebound period could assess either the rebound of previously suppressed thoughts (i.e., deficit in thought suppression) (e.g., Mikulincer, Dolev, & Shaver, 2004), or the preferential processing of specific information (i.e., attentional bias), as suggested in (Maccallum & Bryant, 2010)'s study. The introduction of a control condition without the 5-min of suppression period could have helped in discriminating between both processes. Furthermore, the use of a task such as a modified Sternberg task developed by (Oberauer,

2001, 2005) that specifically addresses the suppression of information which are no-longer relevant (WM updating) could also have provided far more assertive findings.

Fourthly, the stimuli used in the study 2 and 3 have been selected from evaluations and norms based on the general population instead of a bereaved one. Some of the stimuli categorized as negative, positive, and neutral might thus have connection with grief-related representations (as suggested above with positive words). Conversely, the grief-related stimuli might have had no specific connection with the grief-related thought that are usually processed in bereaved ruminators. Accordingly, we suggest to be careful with regard to the interpretations of the observed deficits. Future studies should use stimuli that have been pre-tested in a bereaved population or even that are relevant for the specific bereaved individual involved in the study.

Finally, in the present thesis, the cognitive process of adaptive grieving has been investigated following an intra-individual perspective. Emotional recovery can however not only be thought of as intra-individual but also inter-individual. When individuals actually go through an emotional episode they systematically share this experience with people around them (Rimé, Mesquita, Philippot, & Boca, 1991). The more the emotional experience is intense, the more this social sharing of emotion takes place repetitively and for longer periods (Rimé & al., 1998). Accordingly, the social part (or the absence of it) might have a purpose in the grieving process functioning. This ought to be examined in future studies.

9. Final conclusion

In summary, the current thesis provides evidence concerning the maladaptive cognitive processes associated with severe grief symptoms. In a first study, negative appraisal of the LO and RO stressors was found related to more severe grief symptoms. In addition, disequilibrium in the oscillation process (i.e., higher focus on LO strategies) was shown to be associated with higher levels of grief. Assiduous negative preoccupations with loss-related topics regardless of other types of daily life demands may thus contribute to the maintenance of severe grief reactions. In a second and a third study, mental rumination and intrusions were shown to be characterized by deficits in cognitive inhibition. The tendency to experience elevated level of mental rumination was characterized by fewer abilities to control the access of grief-related information. Furthermore, the tendency to experience frequent and distressful intrusions of grief was characterized by difficulties in the suppression of grief-related, negative, and positive representations. While first depicted

as being distinct cognitive processes (in terms of mechanisms of action – namely avoidant or confrontational – and underlying cognitive processes), both kinds of maladaptive repetitive thought are proposed to be part of a single sequential process which may contribute to the development and the maintenance of prolonged grief reactions. As described, the later sequential process provides a stimulating framework that should be further validated in future research.

10. References

- Boelen, P. A., & Klugkist, I. (2011). Cognitive behavioral variables mediate the associations of neuroticism and attachment insecurity with Prolonged Grief Disorder severity. *Anxiety Stress Coping*, 24(3), 291-307. doi: 10.1080/10615806.2010.527335
- Boelen, P. A., & Van Den Bout, J. (2010). Anxious and depressive avoidance and symptoms of Prolonged Grief, depression, and Post-Traumatic Stress Disorder. *Psychologica Belgica*, 50(1-2), 49-67. doi: 10.1371/journal.pmed.1000121
- Boelen, P. A., & van den Bout, J. (2010). Anxious and Depressive Avoidance and Symptoms of Prolonged Grief, Depression, and Post-Traumatic Stress Disorder. *Psychologica Belgica*, 50(1-2), 49-67.
- Boelen, P. A., van den Bout, J., & van den Hout, M. A. (2003). The role of negative interpretations of grief reactions in emotional problems after bereavement. *Journal of Behavior Therapy and Experimental Psychiatry*, 34(3-4), 225-238. doi: 10.1016/j.jbtep.2003.08.001
- Boelen, P. A., van den Bout, J., & van den Hout, M. A. (2006). Negative cognitions and avoidance in emotional problems after bereavement: a prospective study. *Behaviour Research and Therapy*, 44(11), 1657-1672. doi: 10.1016/j.brat.2005.12.006
- Boelen, P. A., van den Hout, M. A., & van den Bout, J. (2006). A cognitive-behavioral conceptualization of complicated grief. *Clinical Psychology: Science and Practice*, 13, 109-128.
- Bowlby, J. (1980). *Attachment and loss* (Vol. 3 Loss: Sadness and depression). London: Hogarth.
- Dalgleish, T., & Power, M. J. (2004). Emotion-specific and emotion-non-specific components of posttraumatic stress disorder: implications for a taxonomy of related psychopathology. *Behaviour Research and Therapy*, 42, 1069-1088.
- Davis, R. N., & Nolen-Hoeksema, S. (2000). Cognitive inflexibility among ruminators and nonruminators. *Cognitive Therapy and Research*, 24(6), 699-711. doi: 10.1023/a:1005591412406
- Ehlers, A., & Clark, D. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 28, 319-345.
- Ehlers, A., & Clarke, D. A. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy* 38, 319-345.
- Field, N. P., & Sundin, E. C. (2001). Attachment style in adjustment to conjugal bereavement. *Journal of Social and Personal Relationships*, 18(3), 347-361.

- Friedman, N. P., & Miyake, A. (2004). The relations among inhibition and interference control functions: a latent-variable analysis. *Journal of experimental psychology: General*, 133(1), 101-135. doi: 10.1037/0096-3445.133.1.101
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: exposure to corrective information. *Psychological Bulletin* 99, 20-35.
- Fournet, N., Mosca, C., & Moreaud, O. (2007). Deficits in inhibitory processes in normal aging and patients with Alzheimer's disease: A review. *Déficits des processus inhibiteurs dans le vieillissement normal et la maladie d'Alzheimer*, 5(4), 281-294. doi: 10.1684/pnv.2007.0103
- Hasher, L., Zacks, R. T., & May, C. P. (1999) Inhibitory control, circadian arousal, and age. *Vol. 17* (pp. 653-675).
- Horowitz, M. J. (1986). *Stress Response Syndromes* (2nd ed.). Northvale, NJ: Aronson.
- Horowitz, M. J., Bonanno, G. A., & Holen, A. (1993). Pathological grief: Diagnosis and explanation. *Psychosomatic Medicine*, 55(3), 260-273.
- Joormann, J. (2006). Differential effects of rumination and dysphoria on the inhibition of irrelevant emotional material: Evidence from a negative priming task. *Cognitive Therapy and Research*, 30(2), 149-160. doi: 10.1007/s10608-006-9035-8
- Joormann, J. (2010). Cognitive inhibition and emotion regulation in depression. *Current Directions in Psychological Science*, 19(3), 161-166. doi: 10.1177/0963721410370293
- Joormann, J., Yoon, K. L., & Zetsche, U. (2007). Cognitive inhibition in depression. *Applied and Preventive Psychology*, 12(3), 128-139. doi: 10.1016/j.appsy.2007.09.002
- Maccallum, F., & Bryant, R. A. (2010). Attentional bias in complicated grief. *Journal of Affective Disorders*, 125(1-3), 316-322. doi: 10.1016/j.jad.2010.01.070
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, 58, 593-614.
- Michael, S. T., & Snyder, C. R. (2005). Getting unstuck: the roles of hope, finding meaning, and rumination in the adjustment to bereavement among college students. *Death Studies*, 29(5), 435-458. doi: 10.1080/07481180590932544
- Mikulincer, M., Dolev, T., & Shaver, P. R. (2004). Attachment-related strategies during thought suppression: ironic rebounds and vulnerable self-representations. *Journal of Personality and Social Psychology*, 87(6), 940-956. doi: 10.1037/0022-3514.87.6.940
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "Frontal Lobe" tasks: a latent variable analysis. *Cognitive psychology*, 41(1), 49-100. doi: 10.1006/cogp.1999.0734

- Mikulincer, M., & Orbach, I. (1995). Attachment Styles and Repressive Defensiveness: The Accessibility and Architecture of Affective Memories. *Journal of Personality and Social Psychology*, 68(5), 917-925.
- Mikulincer, M., & Shaver, P. R. (2008). An attachment perspective on bereavement. In M. S. Stroebe, R. O. Hansson, H. Schut & W. Stroebe (Eds.), *Handbook of bereavement research and practice: Advances in theory and intervention* (pp. 87-112). Washington, DC: American Psychological Association.
- Nolen-Hoeksema, S. (2001). Ruminative coping and adjustment to bereavement *Handbook of bereavement research: Consequences, coping, and care*. (pp. 545-562): Washington, DC, US: American Psychological Association.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, 61(1), 115-121.
- Oberauer, K. (2001). Removing Irrelevant Information from Working Memory: A Cognitive Aging Study with the Modified Sternberg Task. *Journal of Experimental Psychology: Learning Memory and Cognition*, 27(4), 948-957. doi: 10.1037//0278-7393.27.4.948
- Oberauer, K. (2005). Control of the contents of working memory: A comparison of two paradigms and two age groups. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 31, 714-728.
- Rimé, B., Finkenauer, C., Luminet, O., Zech, E., & Philippot, P. (1998). Social sharing of emotion: new evidence and new questions. In W. Stroebe & M. Hewstone (Eds.), *European Review of Social Psychology*: Vol. 9. (pp. 145-189). Chichester: Wiley.
- Rimé, B., Mesquita, B., Philippot, P., & Boca, S. (1991). Beyond the emotional event: Six studies on the social sharing of emotion. *Cognition and Emotion*, 5(5-6), 435-465.
- Shear, K. M., Monk, T., Houck, P. R., Melhem, N. M., Frank, E., Reynolds, C. F., & Sillowash, R. (2007). An attachment-based model of complicated grief including the role of avoidance. *European Archives of Psychiatry and Clinical Neuroscience*, 257, 453-461. doi: DOI 10.1007/s00406-007-0745-z
- Shear, K. M., & Shair, H. (2005). Attachment, loss, and complicated grief. *Developmental Psychobiology*, 47, 253-267.
- Siemer, M. (2005). Mood-congruent cognitions constitute mood experience. *Emotion*, 5, 296-308.
- Stroebe, M., Boelen, P. A., van den Hout, M., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance: a reinterpretation of its function in adjustment to

- bereavement. *European Archives of Psychiatry and Clinical Neuroscience*, 257(8), 462-472. doi: 10.1007/s00406-007-0746-y
- Stroebe, M., & Schut, H. (1999). The dual process model of coping with bereavement: Rationale and description. *Death Studies*, 23(3), 197-224. doi: 10.1080/074811899201046
- Stroebe, M., & Schut, H. (2010). The dual process model of coping with bereavement: A decade on. *Omega: Journal of Death and Dying*, 61(4), 273-289. doi: 10.2190/OM.61.4.b
- Stroebe, M. S., Schut, H., & Stroebe, W. (2005). Attachment in Coping With Bereavement: A Theoretical Integration. *Review of General Psychology*, 9(1), 48-66. doi: 10.1037/1089-2680.9.1.48
- Stroop, J. R. (1938). Factors affecting speed in serial verbal reactions. *Psychological Monographs*, 50(5), 38-48. doi: 10.1037/h0093516
- Watkins, E. R., & Moulds, M. L. (2013). Repetitive thought. Rumiantion in complicated grief. In M.S. Stroebe, H. Schut & J. van den Bout (Eds.), *Complicated grief. Scientific foundations for health care professionals* (pp. 162-175). Routledge: London and New York.
- Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical Effects of Thought Suppression. *Journal of Personality and Social Psychology*, 53(1), 5-13.
- Zech, E., Ryckebosch-Dayez, A. S., & Delespaux, E. (2010). Improving the efficacy of intervention for bereaved individuals: Toward a process-focused psychotherapeutic perspective. *Psychologica Belgica*, 50(1-2), 103-124.

Appendix

1. Questionnaire d'attachement

Traduction française du questionnaire « Experience in Close Relationships » (ECR) (Brennan, Clark, & Shaver, 1998), basée sur les traductions de Lussier (1998) et adaptée aux personnes endeuillées par Delespaulx et Zech (2009). Les items impairs correspondent à la dimension d'évitement et les items pairs, à la dimension d'anxiété.

Consigne : Les énoncés suivants se rapportent à la manière dont vous vous sentiez à l'intérieur de votre relation et à la manière dont **vous viviez généralement cette relation**. Répondez à chacun des énoncés en indiquant jusqu'à quel point vous êtes en accord ou en désaccord. Inscrivez le chiffre correspondant à votre choix dans l'espace réservé à cet effet selon l'échelle suivante :

Fortement en désaccord			Neutre / partagé(e)		Fortement en accord	
1	2	3	4	5	6	7

1. ____ Je préférerais ne pas montrer mes sentiments profonds à mon époux(se)
2. ____ Je m'inquiétais à l'idée d'être abandonné(e)
3. ____ Je me sentais très à l'aise lorsque j'étais proche de mon époux(se)
4. ____ Je m'inquiétais beaucoup au sujet de ma relation
5. ____ Dès que mon époux(se) se rapprochait de moi, je sentais que je m'éloignais
6. ____ Je m'inquiétais que mon époux(se) ne soit pas autant attaché(e) à moi que je ne l'étais à lui/elle
7. ____ Je devenais mal à l'aise quand mon époux(se) voulait être très proche de moi
8. ____ Je m'inquiétais pas mal à l'idée de perdre mon époux(se)
9. ____ Je ne me sentais pas à l'aise de m'ouvrir à mon époux(se)
10. ____ Je souhaitais souvent que les sentiments de mon époux(se) envers moi soient aussi forts que les miens envers lui/elle
11. ____ Je voulais me rapprocher de mon époux(se) mais je restais distant(e)
12. ____ Je voulais souvent fusionner complètement avec mon époux(se) et cela le/la faisait parfois fuir
13. ____ J'étais nerveux(se) quand mon époux(se) se rapprochait trop de moi
14. ____ Je m'inquiétais à l'idée de me retrouver seule(e)

15. ____ Je me sentais à l'aise de partager mes pensées intimes et mes sentiments avec mon époux(se)
16. ____ Mon désir d'être très proche le/la faisait parfois fuir
17. ____ J'essayais d'éviter de devenir trop proche de mon époux(se)
18. ____ J'avais un grand besoin que mon époux(se) me rassure de son amour
19. ____ Je trouvais relativement facile de devenir proche de mon époux(se)
20. ____ Parfois, je sentais que je forçais mon époux(se) à manifester davantage ses sentiments et son engagement
21. ____ Je me permettais difficilement de dépendre de mon époux(se)
22. ____ Je ne m'inquiétais pas souvent d'être abandonné(e)
23. ____ Je préférais ne pas être trop proche de mon époux(se)
24. ____ Si je n'arrivais pas à ce que mon époux(se) me montre de l'intérêt, je me fâchais ou me mettais en colère
25. ____ Je disais à peu près tout à mon époux(se)
26. ____ Je trouvais que mon époux(se) ne voulait pas se rapprocher de moi autant que je l'aurais voulu
27. ____ Habituellement, je discutais de mes problèmes et de mes soucis avec mon époux(se)
28. ____ Quand la relation était moins forte, je me sentais quelque peu anxieux(se) et peu sûr(e) de moi
29. ____ Je me sentais à l'aise de dépendre de mon époux(se)
30. ____ Je devenais frustré(e) lorsque mon époux(se) n'était pas là autant que je l'aurais voulu
31. ____ Cela ne me dérangeait pas de demander du réconfort, des conseils ou de l'aide à mon époux(se)
32. ____ Je devenais frustré(e) si mon époux(se) n'était pas disponible quand j'avais besoin de lui/d'elle
33. ____ Cela m'aidait de me tourner vers mon/ma partenaire en cas de besoin
34. ____ Quand mon époux(se) me désapprouvait, j'avais vraiment une mauvaise image de moi-même
35. ____ Je me tournais vers mon époux(se) pour différentes raisons, y compris pour avoir du réconfort et pour me faire rassurer
36. ____ J'étais contrarié(e) lorsque mon époux(se) passait du temps loin de moi

2. Questionnaire d' « appraisal » des stressseurs du deuil

Crée par Ryckebosch-Dayez, Delespaux et Zech (2009)

Consigne: Les questions qui suivent concernent différents changements potentiels liés au décès de votre époux(se). Pour chaque phrase, entourez le chiffre qui indique ce que vous ressentez par rapport à ces événements. Le chiffre 3 à gauche, signifie que vous adoptez au maximum le terme de gauche. Le chiffre 3 à droite, signifie que vous adoptez au maximum le terme de droite. Entre les deux, vous avez la possibilité de choisir une réponse plus nuancée. Le choix du chiffre 4 signifie "ni l'un, ni l'autre".

1. ♦ Le décès de mon époux(se) est pour moi un événement

*Peu
négalif*

1
☐

2
☐

3
☐

4
☐

5
☐

6
☐

*Extrêmement
négalif*

7
☐

- ♦ Par rapport au décès de mon époux(se), je me sens

*Capable de
faire face*

3
☐

2
☐

1
☐

0
☐

-1
☐

-2
☐

*Incapable de
faire face*

-3
☐

2. ♦ La perte du lien avec mon époux(se) est pour moi

*Peu
négalive*

1
☐

2
☐

3
☐

4
☐

5
☐

6
☐

*Extrêmement
négalive*

7
☐

- ♦ Par rapport à la perte du lien avec mon époux(se), je me sens

*Capable de
faire face*

3
☐

2
☐

1
☐

0
☐

-1
☐

-2
☐

*Incapable de
faire face*

-3
☐

3. ♦ L'absence de mon époux(se) est pour moi

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

♦ Par rapport à l'absence de mon époux(se), je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

4. ♦ Je vis mes émotions de deuil (ex. tristesse, peur, colère, joie, soulagement, ...) de façon

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

♦ Par rapport à mes émotions de deuil, je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

5. ♦ Le fait d'être veuf(ve) est pour moi

Peu négatif

*Extrêmement
négatif*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

♦ Par rapport au fait d'être veuf(ve), je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

6. ♦ L'idée de nouveaux projets de vie (ex. loisirs, relations, travail,...) est pour moi

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

- ♦ Par rapport à l'idée de nouveaux projets de vie, je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

7. ♦ Je vis les tâches administratives qui surviennent à la suite du décès de mon époux(se) (ex. questions légales, héritage, propriétés...) de façon

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

- ♦ Par rapport aux tâches administratives qui surviennent à la suite du décès de mon époux(se), je me sens

*Capable de
faire face*

*Incapable de
faire face*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

8. ♦ Je vis les tâches qui étaient effectuées auparavant par mon époux(se) (ex. finances, ménage, éducation des enfants, ...) de façon

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

- ♦ Par rapport aux tâches qui étaient effectuées auparavant par mon époux(se), je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

9. ♦ Je vis les contacts sociaux (ex. famille, amis, ...) de façon

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

- ♦ Par rapport aux contacts sociaux, je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

10. ♦ L'idée d'une vie future sans mon époux(se) est pour moi

*Peu
négative*

*Extrêmement
négative*

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

- ♦ Par rapport à l'idée d'une vie future sans mon époux(se), je me sens

*Capable de
faire face*

*Incapable de
faire face*

3	2	1	0	-1	-2	-3
☐	☐	☐	☐	☐	☐	☐

3. Questionnaire de coping de deuil (oscillation)

Questionnaire basé sur le questionnaire « Inventory of Daily Widowed Life » (IDWL) (Caserta & Lund, 2007), révisé par Ryckebosch-Dayez, Delespaulx et Zech (2009). Les items 1 à 11 correspondent aux stratégies centrées sur la perte (confrontation et évitements) et les items 12 à 24 correspondent aux stratégies centrées sur la restauration (confrontation et évitements). Ces items doivent être mélangés aléatoirement avant leur présentation.

Consigne : Vous trouverez ci-dessous une liste de **stratégies** que les personnes endeuillées peuvent mettre en place afin de faire face à certaines difficultés liées à la perte. Pour chaque affirmation, indiquez dans quelle mesure vous y avez passé du temps **durant le mois passé**.

1. Presque jamais (moins d'une fois par mois)
2. Rarement (une fois par mois)
3. Parfois (une fois par semaine)
4. Souvent (une fois par jour)
5. Toujours (plusieurs fois par jour)
6. Non applicable (l'affirmation ne s'applique pas à mon contexte de vie)

	Presque Jamais	Rarement	Parfois	Souvent	Toujours	Non applicable
1. J'essaie de maintenir un contact ou un lien avec mon époux(se) (ex. photos, objets, lieux, ...)	☐	☐	☐	☐	☐	☐
2. Je prends le temps de penser à mon époux(se) et à son décès	☐	☐	☐	☐	☐	☐
3. Je prends le temps de penser aux choses que j'ai vécues avec mon époux(se)	☐	☐	☐	☐	☐	☐

	Presque Jamais	Rarement	Parfois	Souvent	Toujours	Non applicable
4. J'essaie de me laisser aller à mes émotions et de les accepter (ex. tristesse, peur, colère, joie, soulagement, culpabilité,...)	☐	☐	☐	☐	☐	☐
5. J'évite de penser au décès de mon époux(se)	☐	☐	☐	☐	☐	☐
6. J'évite de maintenir un contact ou un lien avec mon époux(se) (ex. éviter les photos, objets, lieux,...)	☐	☐	☐	☐	☐	☐
7. J'essaie de me distraire pour ne pas penser à mon époux(se) et à son décès	☐	☐	☐	☐	☐	☐
8. J'évite de penser à ce que j'ai vécu avec mon époux(se)	☐	☐	☐	☐	☐	☐
9. J'évite de parler de mon époux(se) avec mon entourage afin de ne pas raviver mes émotions	☐	☐	☐	☐	☐	☐
10. J'évite de penser à l'absence et au manque de mon époux(se)	☐	☐	☐	☐	☐	☐
11. J'essaie de mettre mes sentiments et émotions de côté	☐	☐	☐	☐	☐	☐

	Presque Jamais	Rarement	Parfois	Souvent	Toujours	Non applicable
12. J'essaie d'accepter le fait que je suis veuf(ve)	☐	☐	☐	☐	☐	☐
13. J'essaie de comprendre et d'accepter le décès de mon époux(s)	☐	☐	☐	☐	☐	☐
14. J'essaie d'accepter de vivre sans mon époux	☐	☐	☐	☐	☐	☐
15. J'établis de nouveaux projets qui me permettent de regarder vers l'avenir (ex. loisirs, relations, travail,...)	☐	☐	☐	☐	☐	☐
16. J'essaie d'évaluer de manière positive les forces (ex. soutien social, compétences,...) qui me permettent de faire face aux changements qui font suite au décès	☐	☐	☐	☐	☐	☐
17. J'essaie de m'investir dans les relations sociales et affectives (anciennes et/ou nouvelles)	☐	☐	☐	☐	☐	☐
18. J'essaie d'envisager une vie future sans mon époux(se)	☐	☐	☐	☐	☐	☐
19. J'évite de m'investir dans de nouveaux projets (ex. loisirs,	☐	☐	☐	☐	☐	☐

	Presque Jamais	Rarement	Parfois	Souvent	Toujours	Non applicable
relations, travail,...)						
20. J'évite de penser aux tâches administratives qui font suite au décès de mon époux(se) (ex. questions légales, héritage, propriété...)	☐	☐	☐	☐	☐	☐
21. J'évite de m'engager dans la gestion des tâches effectuées auparavant par mon époux(se) (ex. finances, ménage, éducation des enfants,...)	☐	☐	☐	☐	☐	☐
22. J'évite d'envisager les forces (ex. soutien social, compétences,...) qui me permettraient de faire face aux changements qui font suite au décès	☐	☐	☐	☐	☐	☐
23. J'évite les contacts sociaux et affectifs (ex. refuser des invitations au restaurant, fêtes, famille,...)	☐	☐	☐	☐	☐	☐
24. J'évite d'imaginer une vie future sans mon époux(se)	☐	☐	☐	☐	☐	☐

4. Inventaire du deuil traumatique

Traduction française du questionnaire « Inventory of Traumatic Grief » (ITG) (Prigerson, Kasl, & Jacobs, 2001), par Ryckebosch-Dayez, Delespaux et Zech (2009).

Consigne : Cochez la case à côté de la réponse qui décrit le mieux comment vous vous êtes senti(e) le mois passé. Le « blanc » se rapporte à la personne décédée pour qui vous portez le deuil.

Presque jamais = moins d'une fois par mois

Rarement = une fois par mois ou plus, moins d'une fois par semaine

Parfois = une fois par semaine ou plus, moins d'une fois par jour

Souvent = une fois tous les jours

Toujours = plusieurs fois tous les jours

1. Le décès de _____ me submerge ou me dévaste
 - ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
2. Je pense tellement à _____ que je trouve difficile d'accomplir les choses que je réalise d'habitude
 - ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
3. Les souvenirs de _____ me bouleversent
 - ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
4. Je sens que j'ai des difficultés à accepter le décès
 - ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)

5. Je me sens nostalgique et je me languis de _____
- Presque jamais (moins d'une fois par mois)
 - Rarement (une fois par mois)
 - Parfois (une fois par semaine)
 - Souvent (une fois par jour)
 - Toujours (plusieurs fois par jour)
6. Je me sens attiré(e) par les lieux et les choses liés à _____
- Presque jamais (moins d'une fois par mois)
 - Rarement (une fois par mois)
 - Parfois (une fois par semaine)
 - Souvent (une fois par jour)
 - Toujours (plusieurs fois par jour)
7. Je ne peux m'empêcher d'éprouver de la colère au sujet du décès de _____
- Presque jamais (moins d'une fois par mois)
 - Rarement (une fois par mois)
 - Parfois (une fois par semaine)
 - Souvent (une fois par jour)
 - Toujours (plusieurs fois par jour)
8. J'ai du mal à croire au décès de _____
- Presque jamais (moins d'une fois par mois)
 - Rarement (une fois par mois)
 - Parfois (une fois par semaine)
 - Souvent (une fois par jour)
 - Toujours (plusieurs fois par jour)
9. Je me sens stupéfait(e), sidéré(e) ou choqué(e) par le décès de _____
- Presque jamais (moins d'une fois par mois)
 - Rarement (une fois par mois)
 - Parfois (une fois par semaine)
 - Souvent (une fois par jour)
 - Toujours (plusieurs fois par jour)
10. Depuis que _____ est décédé(e), il m'est difficile de faire confiance aux gens
- Aucune difficulté à faire confiance aux autres
 - Un peu
 - Moyennement
 - De manière marquée
 - De manière insurmontable
11. Depuis le décès de _____, j'ai l'impression que je ne suis plus capable de prendre soin des autres ou je me sens distant(e) des personnes auxquelles je tiens
- Aucune difficulté à me sentir proche ou connecté(e) aux autres
 - Un léger sentiment de détachement
 - Un détachement modéré
 - Un détachement marqué
 - Un détachement insurmontable

12. Je ressens de la douleur dans les mêmes régions de mon corps, ou certains symptômes similaires, ou j'ai adopté certains des comportements ou caractéristiques de _____
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
13. Je m'évertue à éviter ce qui me rappelle que _____ est décédé(e)
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
14. J'ai le sentiment que la vie est vide ou dénuée de sens sans _____
- ☐ Aucun sentiment de vide ou de manque de sens
 - ☐ Un léger sentiment de vide ou de manque de sens
 - ☐ Un sentiment modéré
 - ☐ Un sentiment marqué
 - ☐ Un sentiment insurmontable
15. J'entends la voix de _____ qui me parle
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
16. Je vois _____ se tenir devant moi
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
17. J'ai le sentiment de ne plus rien ressentir depuis le décès de _____
- ☐ Aucun sentiment d'engourdissement
 - ☐ Un léger sentiment d'engourdissement
 - ☐ Un sentiment modéré
 - ☐ Un sentiment marqué
 - ☐ Un sentiment insurmontable
18. Je trouve injuste que je doive vivre alors que _____ est décédé(e)
- ☐ Aucun sentiment de culpabilité d'avoir survécu au défunt
 - ☐ Un léger sentiment de culpabilité
 - ☐ Un sentiment modéré
 - ☐ Un sentiment marqué
 - ☐ Un sentiment insurmontable

19. Je ressens de l'amertume vis à vis du décès de _____
- ☐ Aucun sentiment d'amertume
 - ☐ Un léger sentiment d'amertume
 - ☐ Un sentiment modéré
 - ☐ Un sentiment marqué
 - ☐ Un sentiment insurmontable
20. J'envie les personnes qui n'ont pas perdu quelqu'un de proche
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
21. J'ai le sentiment que le futur n'a pas de sens ou de but sans _____
- ☐ Aucune impression que le futur n'a pas de sens
 - ☐ Une légère impression que le futur n'a pas de sens
 - ☐ Une impression modérée
 - ☐ Une impression marquée
 - ☐ Une impression insurmontable
22. Je me sens seul(e) depuis que _____ est décédé(e)
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
23. Il est difficile pour moi d'imaginer que la vie soit épanouissante sans _____
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
24. J'ai l'impression qu'une partie de moi est morte avec _____
- ☐ Presque jamais (moins d'une fois par mois)
 - ☐ Rarement (une fois par mois)
 - ☐ Parfois (une fois par semaine)
 - ☐ Souvent (une fois par jour)
 - ☐ Toujours (plusieurs fois par jour)
25. J'ai l'impression que le décès a changé ma vision du monde
- ☐ Aucune impression d'une vision du monde changée
 - ☐ Une légère impression d'une vision du monde changée
 - ☐ Une impression modérée
 - ☐ Une impression marquée
 - ☐ Une impression insurmontable

26. J'ai perdu mon sentiment de sécurité ou de sureté depuis le décès de _____
- ☐ Aucun changement de mon sentiment de sécurité
 - ☐ Un léger sentiment d'insécurité
 - ☐ Un sentiment modéré
 - ☐ Un sentiment marqué
 - ☐ Un sentiment insurmontable
27. J'ai perdu mon sentiment de contrôle depuis le décès de _____
- ☐ Aucun changement de mon sentiment de contrôle
 - ☐ Un léger sentiment de perte de contrôle
 - ☐ Un sentiment modéré
 - ☐ Un sentiment marqué
 - ☐ Un sentiment insurmontable
28. Je crois que mon deuil a significativement détérioré mon fonctionnement social, professionnel ou dans d'autres domaines
- ☐ Aucune détérioration de mon fonctionnement
 - ☐ Légère détérioration
 - ☐ Moyenne
 - ☐ Sévère
 - ☐ Extrême
29. Je suis à fleur de peau, prêt(e) à sursauter ou facilement effrayé(e) depuis le décès
- ☐ Aucune impression d'être à fleur de peau
 - ☐ Légère impression d'être à fleur de peau
 - ☐ Une impression modérée
 - ☐ Une impression marquée
 - ☐ Une impression insurmontable
30. Depuis le décès, mon sommeil a été _____
- ☐ Généralement normal
 - ☐ Légèrement perturbé
 - ☐ Modérément perturbé
 - ☐ Très perturbé
 - ☐ Extrêmement perturbé
31. Combien de mois après le décès l'ensemble de ces réactions ont-elles commencé ?
_____ mois (0= immédiatement)
32. Depuis combien de mois ressentez-vous l'ensemble de ces réactions ?
_____ mois (0= jamais)
33. Y-a-t-il eu des périodes où vous n'aviez pas des vagues de tristesse associées à votre deuil et puis que ces sentiments recommençaient à nouveau ?
- ☐ Oui
 - ☐ Non
34. Pouvez-vous décrire comment vos sentiments de deuil ont évolué avec le temps ?

5. Questionnaire de rumination mentale

Traduction française du questionnaire « Ruminative Response Scale » (RRS) inclu dans le questionnaire « Response Style Questionnaire » (RSQ) développé par Nolen-Hoeksema et Morrow (1991).

Consignes : Les gens pensent et font différentes choses lorsqu'ils se sentent découragés, tristes ou déprimés. Veuillez lire chacun des énoncés ci-dessous et indiquer à quelle fréquence vous faites ce qui est mentionné lorsque vous vous sentez découragé(e), triste ou déprimé(e). Indiquez ce que vous faites **habituellement** et non ce que vous pensez que vous devriez faire.

	Presque jamais	Parfois	Souvent	Presque toujours
1. Penser à quel point vous vous sentez seul.	☐	☐	☐	☐
2. Penser « je ne serai pas capable de faire mon travail parce que je me sens tellement mal »	☐	☐	☐	☐
3. Penser à vos sensations de fatigue et de douleur	☐	☐	☐	☐
4. Penser à quel point il est difficile de vous concentrer	☐	☐	☐	☐
5. Penser à quel point vous vous sentez passif(ve) et démotivé(e).	☐	☐	☐	☐
6. Analyser des événements récents pour essayer de comprendre pourquoi vous êtes déprimé(e).	☐	☐	☐	☐
7. Penser à quel point vous ne semblez plus rien ressentir.	☐	☐	☐	☐
8. Penser “ Pourquoi ne puis-je pas me mettre au travail ?”	☐	☐	☐	☐
9. Penser «Pourquoi est-ce que je réagis toujours de cette façon ?»	☐	☐	☐	☐
10. Partir seul et penser aux raisons pour lesquelles vous vous sentez comme cela.	☐	☐	☐	☐
11. Écrire ce à quoi vous pensez et l'analyser	☐	☐	☐	☐
12. Penser à une situation récente en souhaitant que ça se soit mieux passé.	☐	☐	☐	☐
13. Penser : «Pourquoi ai-je des problèmes que les autres n'ont pas ? »	☐	☐	☐	☐
14. Penser à quel point vous vous sentez triste.	☐	☐	☐	☐
15. Penser à tous vos défauts, faiblesses, fautes et erreurs.	☐	☐	☐	☐
16.				

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 17. Penser à quel point vous n'avez envie de rien faire. | ☐ | ☐ | ☐ | ☐ |
| 18. Analyser votre personnalité pour essayer de comprendre pourquoi vous êtes déprimé(e). | ☐ | ☐ | ☐ | ☐ |
| 19. Aller quelque part seul pour penser à ce que vous ressentez | ☐ | ☐ | ☐ | ☐ |
| 20. Penser à quel point vous êtes en colère contre vous-même | ☐ | ☐ | ☐ | ☐ |
| 21. Penser: "Qu'ai-je fait pour mériter cela?" | ☐ | ☐ | ☐ | ☐ |
| 22. Penser: "Je ne serai pas capable de me concentrer si je continue à me sentir comme cela» | ☐ | ☐ | ☐ | ☐ |
| 23. Penser "Pourquoi ne puis-je pas mieux gérer les choses ? » | ☐ | ☐ | ☐ | ☐ |

6. Questionnaire d' « intrusions »

Traduction française du questionnaire « Rumination Index Questionnaire » (RIQ)
(Michael & Snyder, 2005), par Delespaulx et Zech (2009).

Consignes : Pensez s'il vous plaît à votre conjoint. Prenez un moment pour penser à la semaine passée et rappelez-vous les souvenirs et les images mentales que vous avez revécus à propos de votre conjoint et de son décès. Répondez aux questions suivantes.

	1 Jamais	2	3	4	5 Tout le temps
1. À quelle fréquence les souvenirs, pensées et images mentales à propos de votre conjoint(e) vous sont revenus à l'esprit ?	☐	☐	☐	☐	☐
2. À quelle fréquence ces souvenirs, pensées et images mentales étaient désagréables/difficiles ?	☐	☐	☐	☐	☐
3. Est-il arrivé que les souvenirs, pensées et images mentales liés à votre conjoint(e) ne puissent sortir de votre esprit même si vous le vouliez ?	☐	☐	☐	☐	☐
4. À quelle fréquence ces souvenirs, pensées et images mentales qui sont arrivés à votre esprit vous ont rendu(e) triste ou troublé(e)	☐	☐	☐	☐	☐
5. Avez-vous essayé de bloquer les pensées et souvenirs désagréables ?	☐	☐	☐	☐	☐
6. Avez-vous ressenti des difficultés à faire d'autres choses parce que les souvenirs, pensées et images mentales de votre conjoint(e) continuaient d'arriver à votre esprit ?	☐	☐	☐	☐	☐
7. À quelle fréquence les souvenirs, pensées et images mentales de votre conjoint(e) qui vous venaient à l'esprit vous ont rendu(e) frustré(e) ou fâché(e) ?	☐	☐	☐	☐	☐

7. Matrice des listes des mots deuil, négatifs, positifs, et neutres pour la tâche Stroop

Pairage des mots en fonction de chaque valence, leurs fréquences et leurs nombres de voisins orthographiques Franck (2009).

	Mots deuils	Mots positifs	Mots neutres	Mots négatifs
Groupe 1	Décès 5 lettres Fréq. 9,13 Voisin : 0	Bague 5 lettres Fréq. 9,10 Voisin : 9	Poêle 5 lettres Fréq. 9, 68 Voisin : 2	Chaos 5 lettres Fréq. 9,13 Voisin : 3
Groupe 2	Mortel 6 lettres Fréq. 7,26 Voisin : 2	Guitare 6 lettres Fréq. 7,84 Voisin : 0	Peigne 6 lettres Fréq. 6,84 Voisin : 6	Féroce 6 lettres Fréq. 7,16 Voisin : 0
Groupe 3	Obsèques 8 lettres Fréq. 2,68 Voisin : 0	Bravoure 8 lettres Fréq. 1,94 Voisin : 0	Brouette 8 lettres Fréq. 2,94 Voisin : 1	Tromperie 8 lettres Fréq. 1,19 Voisin : 0
Groupe 4	Dépouille 9 lettres Fréq. 4,94 Voisin : 3	Honnêteté 9 lettres Fréq. 5,58 Voisin : 0	Chaussure 9 lettres Fréq. 5,00 Voisin : 0	Paresseux 9 lettres Fréq. 5,68 Voisin : 0

8. Matrice des listes de mots pour le NAP et création des listes prédéfinies de mots deuils et positifs

(Procédure similaire pour la liste de mots négatifs et positifs)

Une tâche NAP nécessite la construction d'une liste de mots composée elle-même de deux listes de mots représentant chacune une valence émotionnelle. Dans notre cas, il s'agit d'une liste composée d'une première liste de mots liés au **deuil** et d'une seconde liste de mot **positifs**.

Notons que les **moyennes du nombre de lettres** de la première et de la seconde liste doivent être similaires (plus le distracteur est long comparé à la cible, plus il sera difficile de l'inhiber et inversement). Nous avons donc décidé d'apparier les mots des deux listes en fonction de leur **longueur**. Le choix des mots de la liste de mots positifs s'est réalisé sur base de la longueur des mots en lien avec le deuil (en effet, vu que nous avons tout juste 40 mots « deuil » et que les mots positifs étaient en plus grand nombre, l'appariement s'est réalisé à partir du nombre de lettres des mots de la première liste). Nous avons donc défini 2 listes de 40 mots appariée du point de vue de la longueur des mots.

En fonction des contraintes du programme E-Prime (création d'expérience), nous avons décidé (en collaboration avec Pierre Mahau) de déterminer les essais NAP au préalable. Nous entendons par essais NAP, les deux paires de mots consécutives, la première correspondant à **l'essai prime** et la seconde correspondant à **l'essai test**.

Plusieurs étapes ont été nécessaires pour déterminer les **règles/contraintes** à respecter pour apparier les mots ensemble. Celles-ci sont présentées ci-dessous :

- Création d'une matrice pour organiser les listes de mots (en collaboration avec Augustin Regout). Cette matrice doit tenir compte des contraintes suivantes (les contraintes ont été définies sur base des travaux de Joormann ; ex. 2006):
 - Chaque mot doit apparaître **deux fois**, une fois dans l'essai **prime** et une fois dans l'essai **test**, mais en tenant compte du fait que s'il apparaît en tant que **distracteur** dans un premier temps, il doit apparaître en tant que **cible** dans le deuxième temps ou inversement.
 - Un même mot ne peut apparaître deux fois au cours du même essai (prime + test).

	Essai prime		Essai test	
	distracteur	cible	distracteur	cible
Deuil/positif				
xp	+1	D1	D2	+2
	D3	+3	+4	D4
contrôle	D4	D2	D1	+1
	+2	+4	+3	D3

Pour éviter tout biais de réponse, nous avons pensé qu'il valait mieux que chaque **appariement** de deux mots n'apparaisse pas deux fois.

Recherche des mots qui sont appariés deux fois ensemble :

	Essai prime		Essai test	
	distracteur	cible	distracteur	cible
Deuil/positif				
xp	+1	D1	D2	+2
	D3	+3	+4	D4
contrôle	D4	D2	D1	+1
	+2	+4	+3	D3

Nous observons que les paires (**+1 et D1**) et (**D3 et +3**) apparaissent deux fois. Une solution pour éviter les doublons est 1/ de dédoubler le tableau puis 2/ d'inverser les mots appartenant aux paires des mêmes conditions expérimentales.

1/ Dédoublage du tableau

	Essai prime		Essai test	
	distracteur	cible	distracteur	cible
Deuil/positif				
xp	+1	D1	D2	+2
	D3	+3	+4	D4
contrôle	D4	D2	D1	+1
	+2	+4	+3	D3
xp	+5	D5	D6	+6
	D7	+7	+8	D8
contrôle	D8	D6	D5	+5
	+6	+8	+7	D7

2/ Inversion des mots des mêmes conditions expérimentales (suppression des doublons)

	Essai prime		Essai test	
	distracteur	cible	distracteur	cible
Deuil/positif				
xp	+1	D1	D2	+2
	D3	+3	+4	D4
contrôle	D4	D2	D5	+1
	+2	+4	+7	D3
xp	+5	D5	D6	+6
	D7	+7	+8	D8
contrôle	D8	D6	D1	+5
	+6	+8	+3	D7

Maintenant que chaque paire de mots n'apparaît qu'une fois, nous pouvons nous demander dans quelle mesure **l'interaction distracteur/cible** pourrait avoir un impact sur la variabilité des temps de réponse. En effet, nous suggérons qu'une différence entre la **fréquence** ou la **longueur** du distracteur et celle de la cible pourrait également avoir un impact sur le temps d'évaluation de la valence des mots.

- Détermination des essais qui doivent comporter des paires de mots de même **fréquence/longueur**

Dans l'ensemble les paires de mots avaient déjà été créées sur base de la longueur de ceux-ci de manière à obtenir des paires de mots similaires du point de vue de la longueur ; cependant, l'ensemble des paires n'a pu répondre à ce critère à cause du nombre limité de mots ; les paires de mots les plus similaires du point de vue de la longueur ont été placées de façon privilégiée au sein des essais test vs. essais prime vu que l'analyse des TRs se fait sur les Essais test.

	Essai prime		Essai test	
	distracteur	cible	distracteur	cible
Deuil/positif				
xp	+1	D1	D2	+2
	D3	+3	+4	D4
contrôle	D4	D2	D5	+1
	+2	+4	+7	D3
xp	+5	D5	D6	+6
	D7	+7	+8	D8
contrôle	D8	D6	D1	+5
	+6	+8	+3	D7

En plus de l'interaction distracteur/cible sur les temps de réponse, nous pouvons observer deux facteurs susceptibles d'intervenir dans la variabilité des **temps de réponse lors de l'évaluation de la valence des mots** : il s'agit de 1/ la **fréquence** et de 2/ la **longueur** des mots (voir rdv Agnesa Pillon 16/11/10). Selon Agnesa Pilon, le facteur fréquence a plus d'influence que le facteur longueur sur le temps de réponse.

Pour contrôler l'influence de ces deux facteurs sur le temps d'évaluation de la valence des mots nous avons décidé d'apparier les mots des conditions qui seront comparées entre elles en fonction de leur **fréquence** et de leur **longueur**.

- Détermination des paires de mots qui doivent être de même **fréquence** et de même **longueur** (+2 et +1 ; D4 et D3 ; +6 et +5 ; D8 et D7) (voir rdv Agnesa Pillon 16/11/10)

Les mots dont les RTs sont comparés entre eux doivent être de même fréquence puisque la fréquence a un impact sur l'évaluation de la valence et donc sur les RTs.

	Essai prime		Essai test	
	distracteur	cible	distracteur	cible
Deuil/positif				
xp	+1	D1	D2	+2
	D3	+3	+4	D4
contrôle	D4	D2	D5	+1
	+2	+4	+7	D3
xp	+5	D5	D6	+6
	D7	+7	+8	D8
contrôle	D8	D6	D1	+5
	+6	+8	+3	D7

En résumé : Il faut sélectionner 4 paires de mots (2 **aires de mots « deuil »** et 2 **aires de mots positifs**) dont la fréquence n'est pas différente de manière significative. Pour cela nous proposons de trier les fréquences par ordre croissant dans SPSS et ensuite de sélectionner les paires de mots les plus proches du point de vue de 1/ leur fréquence → pour minimiser l'écart entre les deux fréquences et de 2/ leur longueur → pour minimiser l'écart entre les deux longueurs. Ensuite, il faut apparier chacun des mots sélectionnés avec des mots de longueur similaire.

Pour créer nos listes, nous avons tout d'abord sélectionné les mots qui étaient en mesure de satisfaire les positions les plus « pertinentes » (ex : Essai test – Cible). Les mots restants ont ensuite été placés dans les positions les moins « pertinentes » (ex : Essai prime – Distracteur).

Une fois les listes de mots créées, chacun des essais NAP (correspondant à une ligne dans le tableau et constitué de deux essais : un essai prime et un essai test) est implémenté dans E-Prime qui les présentera de façon aléatoire aux participants.

9. Liste prédéfinie des mots « deuils » et positifs pour la tâche NAP

	Distracteur	Cible	Distracteur	Cible	Condition
XP	Coccinelle	Cimetière	Sépulture	Pacifisme	1
	Trépassé	Tranquille	Télévision	Funérarium	2
Contrôle	Funérarium	Sépulture	Corbillard	Coccinelle	3
	Pacifisme	Télévision	Bravoure	Trépassé	4
XP	Fertilité	Corbillard	Incinération	Balançoire	1
	Inhumation	Bravoure	Gentillesse	Nécrologique	2
Contrôle	Nécrologique	Incinération	Cimetière	Fertilité	3
	Balançoire	Gentillesse	Tranquille	Inhumation	4
XP	Honnêteté	Suicide	Dépouille	Sauvetage	1
	Décédé	Espérance	Voyage	Trépas	2
Contrôle	Trépas	Dépouille	Posthume	Honnêteté	3
	Sauvetage	Voyage	Amitié	Décédé	4
XP	Confort	Posthume	Caveau	Gaieté	1
	Funéraire	Amitié	Entraînement	Condoléances	2
Contrôle	Condoléances	Caveau	Suicide	Confort	3
	Gaieté	Entraînement	Espérance	Funéraire	4
XP	Egalité	Perte	Cercueil	Ambition	1
	Mortuaire	Imagination	Sécurité	Obsèques	2
Contrôle	Obsèques	Cercueil	Chagrin	Egalité	3
	Ambition	Sécurité	Possibilité	Mortuaire	4
XP	Fruit	Chagrin	Cadavre	Agréable	1
	Funérailles	Possibilité	Courage	Funeste	2
Contrôle	Funeste	Cadavre	Perte	Fruit	3
	Agréable	Courage	Imagination	Funérailles	4
XP	Bonheur	Mortel	Tombeau	Energie	1
	Mourant	Force	Propre	Adieux	2
Contrôle	Adieux	Tombeau	Funèbre	Bonheur	3
	Energie	Propre	Douceur	Mourant	4
XP	Vérité	Funèbre	Morgue	Liberté	1
	Décès	Douceur	Faculté	Veuvage	2
Contrôle	Veuvage	Morgue	Mortel	Vérité	3
	Liberté	Faculté	Force	Décès	4
XP	Intelligence	Disparition	Mort	Génie	1
	Périr	Soleil	Plaisir	Deuil	2
Contrôle	Deuil	Mort	Enterrement	intelligence	3
	Génie	Plaisir	Fleur	Périr	4
XP	Espoir	Enterrement	Défunt	Calme	1
	Pleurer	Fleur	Joie	Tombe	2
Contrôle	Tombe	Défunt	Disparition	Espoir	3
	Calme	Joie	Soleil	Pleurer	4

10. Liste prédéfinie des mots négatifs et positifs pour la tâche NAP

	Distracteur	Cible	Distracteur	Cible	Condition
XP	Astuce	Chaos	Trahison	Ecologie	5
	Satire	Aptitude	Victoire	Atrocité	6
Contrôle	Atrocité	Trahison	Diable	Astuce	7
	Ecologie	Victoire	Berceau	Satire	8
XP	Clown	Diable	Cruauté	Entrain	5
	Tromperie	Berceau	Chocolat	Mensonge	6
Contôle	Mensonge	Cruauté	Chaos	Clown	7
	Entrain	Chocolat	Aptitude	Tromperie	8
XP	Baignoire	Fatigue	Paresseux	Franchise	5
	Racisme	Aisance	Souplesse	Crocodile	6
Contrôle	Crocodile	Paresseux	Isolement	Baignoire	7
	Franchise	Souplesse	Passion	Racisme	8
XP	Piscine	Isolement	Poussière	Immensité	5
	Traître	Passion	Lumière	Pénurie	6
Contôle	Pénurie	Poussière	Fatigue	Piscine	7
	Immensité	Lumière	Aisance	Traître	8
XP	Songe	Crainte	Rage	Joli	5
	Féroce	Intuition	Justice	Anxiété	6
Contrôle	Anxiété	Rage	Ennui	Songe	7
	Joli	Justice	Cerise	Féroce	8
XP	Echange	Ennui	Tristesse	Capacité	5
	Monarchie	Cerise	Equilibre	Méchanceté	6
Contôle	Méchanceté	Tristesse	Crainte	Echange	7
	Capacité	Equilibre	Intuition	Monarchie	8
XP	Gloire	Obscur	Araignée	Changement	5
	Injustice	Vertu	Richesse	Lassitude	6
Contrôle	Lassitude	Araignée	Vénéneux	Gloire	7
	Changement	Richesse	Stabilité	Injustice	8
XP	Chaleur	Vénéneux	Oubli	Clair	5
	Haine	stabilité	Rapide	Alcool	6
Contrôle	Alcool	Oubli	Obscur	Chaleur	7
	Clair	Rapide	Vertu	Haine	8
XP	Etoile	Horreur	Danger	Sûre	5
	Chasse	Tulipe	Chaud	Crise	6
Contrôle	Crise	Danger	Usure	Etoile	7
	Sûre	Chaud	Gâteau	Chasse	8
XP	Jardin	Usure	Douleur	Qualité	5
	Erreur	Gâteau	Faveur	Sale	6
Contrôle	Sale	Douleur	Horreur	Jardin	7
	Qualité	Faveur	Tulipe	Erreur	8

11. Literature review of the rumination concept

This appendix reports how rumination has been described, as well as measured, in the empirical studies having shown a link between rumination and detrimental grief outcomes. For each distinct description and operationalization (from a chronological point of view), the specific related features of the rumination concept are highlighted (see the column “Specific features of the rumination concept”). It has to be specified, beforehand, that even if strongly described, across the reported publications, as a causal factor of pathology, rumination can also be understood as a **grief symptom**. Rumination is sometimes certainly assimilated with symptoms like **yearning** and **longing** (see for example M. S. Stroebe, Schut, & Stroebe, 2005), which are both grief symptoms⁷. In the same way, rumination resembles symptoms like **intrusions of grief** (i.e., excessive and prolonged intrusions and flooding with negative images and emotions) (M. J. Horowitz et al., 1993). As a result, if we want to examine rumination as a maladaptive process (risk factor) rather than a symptom, it appears important to focus primarily on the existent longitudinal studies. Such designed studies are indeed thought to offer stronger indications about the causal role of rumination on exacerbated grief symptoms rather than studies with cross-sectional designs. However, because the current cross-sectional studies also provide notable information with regard to the rumination process, we also present them although staying vigilant with their results interpretation. In brief, both longitudinal and cross-sectional studies are presented below but distinctively.

⁷ See the criteria A2 in the ITG (Prigerson & Jacobs, 2001)

Longitudinal studies

Author	Label and description of the rumination process	Measure	Specific features of the rumination concept
Nolen-Hoeksema, Parker, and Larson (1994)	Ruminative coping: Defined as “engaging in thoughts and behaviors that focus one's attention on one's depressive symptoms and the meanings of these symptoms (Nolen-Hoeksema, 1991)”	Ruminative Response Scale (RSS): The RRS assesses people's tendencies to ruminative when distressed. The scale includes 22 items that tap the frequency of thoughts in response to depressed moods that are self-focused (e.g., I think "Why do I react this way?"), symptom-focused (e.g., I think about how hard it is to concentrate), and focused on the possible consequences and causes of their mood (e.g., I think "I won't be able to do my job if I don't snap out of this"), rated on a 4-point scale (<i>almost never – almost always</i>).	▪ The ruminative process is focused on depressive symptoms (vs. specific grief-related topics) ▪ The ruminative process appears to be voluntary
Nolen-Hoeksema, McBride, and Larson (1997)	Rumination: Defined as “passively and repetitively focusing on one's symptoms of distress and the circumstances surrounding those symptoms. People caught in rumination spend much time thinking about how badly they feel and pondering questions like "Will I ever feel better?" and “Why am I such a mess?”.”	Coding of interview transcripts: Identifying in free-interviews rumination-related “idea unit” (i.e., passages in which the participant describes a memory, a current feeling state or thought, a current or planned activity). Idea unit in free-interviews were identified as reflecting rumination following the next conceptual category: (a) regrets about interactions with the deceased partner (e.g., wishes he had done more for the partner, wishes the quality of their time had been better, wishes he had not said something to the partner), (b) intrusive thoughts about the partner's	▪ The ruminative process is specified as focused on grief-related topics (i.e., specific grief-related emotions (e.g., regrets), as well as grief-related contents (e.g., thoughts about partner's death)) ▪ The ruminative process not only appears to be voluntary (see point (d)) but also intrusive/involuntary⁸ (see point (b))

⁸ The characteristic of intrusions is that they appear automatically and involuntarily in consciousness (e.g., Bernstein, 2009; Brewin et al., 2010)

		death, (c) thoughts about current negative feeling states, (d) statements that he was isolating himself to focus on himself, and (e) concerns that he was not coping well or would not be able to adjust to the loss.	
Nolen-Hoeksema and Larson (1999)	Ruminative coping: Defined as “engaging in thoughts and behaviors that focus one's attention on one's depressive symptoms and the meanings of these symptoms (Nolen-Hoeksema, 1991)”	Ruminative Response Scale (RSS): The RRS assesses people’s tendencies to ruminative when distressed. The scale includes 22 items that tap the frequency of thoughts in response to depressed moods that are self-focused (e.g., I think "Why do I react this way?"), symptom-focused (e.g., I think about how hard it is to concentrate), and focused on the possible consequences and causes of their mood (e.g., I think "I won't be able to do my job if I don't snap out of this"), rated on a 4-point scale (<i>almost never – almost always</i>).	▪ The ruminative process is focused on depressive symptoms (vs. specific grief-related topics) ▪ The ruminative process appears to be voluntary
Bonanno, Papa, Lalande, Zhang, and Noll (2005)	Grief work as rumination hypothesis: The grief work as rumination hypothesis is a revisionist perspective which not only rejects the necessity of grief processing for recovery from loss but views extensive grief processing as a form of rumination that may exacerbate rather than ameliorate distress. Accordingly, rumination is defined as “a form of extensive grief processing (e.g., thinking about the loss) ... that is self-perpetuating.”	13-items Grief Processing scale: This scale was developed through collaborative meetings between investigators in the United States (George A. Bonanno) and the Republic of China (Nanping Zhang) and their associates. The grief processing scale measures five behaviors (thinking about the deceased, searching for meaning, having positive memories of the deceased, talking about the deceased, and expressing feelings about the deceased) rated on a 5-point scale for frequency of occurrence in the past month (1= almost never, 5 = almost	▪ The ruminative process is considered as a maladaptive extreme of the adaptive grief processing ▪ The ruminative process include the search for meaning ▪ The ruminative thoughts can be positively oriented ▪ The ruminative process can take the form of social sharing

		constantly). Each item is formulated following two different contexts: with close family members (e.g., When you were with close family members during the past month, how often did you think about your deceased spouse/child?) and with close friends (e.g., when you were with close friends during the past month, how often did you think about your deceased spouse/child?). Responses for three items (thinking, searching, having positive memories) were also formulated for participants being alone (e.g., When you were alone during the past month, how often did you think about your deceased spouse/child?).	▪ The ruminative process can take place in different social contexts of thinking.
Boelen, van den Bout, and van den Hout (2006)	Rumination: Seen as an avoidant cognitive strategy rumination is defined as “representing deliberately pondering on a narrow aspect of the loss, namely the events leading up to it” The line of reasoning behind including rumination as an avoidance strategy was that pondering on one particular component of the loss (i.e., the cause of the loss) can serve to escape from admitting to the meanings and implications of the loss itself and, as such, can be a form of avoidance.	3-items Rumination Scale: Assessment of rumination is conducted with three specific items (but included in a 10 items scale measuring potentially maladaptive avoidance strategies). Items are constructed on the basis of literature on avoidance in grief (M. J. Horowitz et al., 1993; Kavanagh, 1990) and pilot interviews with patients suffering from complicated grief (CG). Rumination-related items have to do with aspects of the cause of the loss (e.g., “I keep on pondering about who is to blame for the loss”, “I ruminate about the question why he/she died”). Frequency of strategies including rumination are rated on scales ranging from 0 (never) to 100 (always).	▪ The ruminative process is thought to have an avoidant function, i.e., the meaning of the loss is not directly faced.

van der Houwen, Stroebe, Schut Stroebe, and Van den Bout (2010)	Rumination No specific definition	8-items Rumination Scale Rumination is investigated according to literature on rumination in general and on rumination in bereavement specifically (e.g., Boelen, Stroebe, Schut, & Zijerveld, 2006; Boelen, van den Bout, et al., 2006; Boelen, van den Hout, & van den Bout, 2006; Nolen-Hoeksema, 1991). A homemade 8-item questionnaire has been specifically created. Items used to measure rumination are: 1. I think about how bad I feel since my [...] died. 2. I think about why my [...] has died. 3. I think about the things that I would like to have done differently in my relationship with my [...]. 4. I think about the consequences if I keep on feeling sad. 5. I think about things that happened when my [...] died. 6. I think about how my [...]’s death could have been prevented. 7. I think about who is responsible for my [...]’s death. 8. I think about the way I react to my [...]’s death. The blanks are filled in with the appropriate relationship word (e.g., son or partner). Items are rated with respect to the past week on a 5-point scale ranging from (almost) never (1) to (almost) constantly (5).	▪ On this scale, no specific dimension can be reported in addition to the previous studies. ▪ However, this is the first scale that aggregated the Nolen-Hoeksema (2001) definition with specific grief-related contents. ▪ Grief-related thoughts that are self-focused, symptom-focused, and focused on the possible consequences and causes of their mood are then included. ▪ In addition, thoughts that have to do with grief-related concerns such as the cause of the loss as projected in Boelen, van den Bout, et al. (2006), the circumstances surrounding the death or regrets with regards to the past relationship as projected in Nolen-Hoeksema et al. (1997) are also gathered
---	--	--	---

Cross-sectional studies

Michael and Snyder (2005)	Rumination: Defined as “repetitive thought focused on negative emotions and what these emotions mean without getting any closer to finding a solution that lessens these feelings”.	Rumination Index questionnaire (RIQ) Based upon the research of Silver and her colleagues (Holman & Silver, 1998; Silver, Boon, & Stones, 1983; Tait & Silver, 1989) and Davis, Nolen-Hoeksema, and Larson (1998), the author created the RIQ that is a 7-items measuring scale designed to capture intrusive ideation related to the death. Items were adapted from the Silver et al. studies and, as in those studies, were aggregated in a single score. These items tap repetitive memories, thoughts, and mental pictures about the death of a loved one and the degree to which these thoughts were intrusive, hard to suppress, and distressing. Examples of items are: “How often have you found that memories, thoughts, or mental pictures of your loved one pop into your mind?”; “How often did memories, thoughts, and mental pictures that came into your mind about your loved one make you feel upset or troubled?”; “Did you ever find you couldn’t get memories, thoughts, and mental pictures of your loved one out of your mind even though you wanted to?”.	▪ The ruminative process appears to be intrusive/involuntary ▪ The intrusive aspect of rumination is further associated with distress, as well as difficulties to suppress the elicited thought ▪ The ruminative thoughts are seen as either verbal (i.e., ideation) or visual (i.e., mental pictures, memories)
Taku, Calhoun, Cann, and Tedeschi (2008)	Rumination: The author have distinguished two different kinds of rumination that might arise after a life crisis: mostly automatic and intrusive thoughts about the event,	Rumination Scale Assessment of rumination was realized with a 14-item scale developed by Calhoun, Cann, Tedeschi, and McMillan (2000) and reflecting four kinds of rumination: intrusive rumination soon after the event	▪ The ruminative process is proposed to be of two different kinds: a more automatic and intrusive/involuntary process (i.e., “intrusive rumination”) and a more voluntary process (i.e.,

	and more deliberate rumination designed to make sense from the event. In this study, intrusive rumination was characterized by repetitive, negative, and unwanted thoughts, whereas deliberate rumination was described as repetitive purposeful thoughts focused on aspects of the struggle with the event (Calhoun & Tedeschi, 2006). In addition, through their perspective, the timing of the rumination is seemingly important (Tedeschi & Calhoun, 2004). As a result, a distinction has also been made between rumination closer to the event and recent rumination.	(e.g., “Soon after my traumatic experience, I thought about the event when I didn’t mean to”), recent intrusive rumination (e.g., “Recently, thoughts about the event came to my mind and I could not get rid of them”), deliberate rumination soon after the event (e.g., “Soon after the event, I reminded myself of some of the benefits that came from adjusting to the traumatic experience), recent deliberate rumination (e.g., “Recently, I have tried to make something good come out of my struggle).	“deliberate rumination”) ▪ The ruminative process is specified to take place at different moments: soon after the loss or recently
Morina (2011)	Rumination Morina (2011) referred to the definition of Nolen-Hoeksema (1991): “repetitive and passive thinking about negative emotions and the possible causes and consequences of symptoms of distress” Morina (2011) also referred to the framework of behavioral activation conceptualization of depression in which rumination is suggested to lead to an avoidance of active engagement with aversive environments.	Cognitive Emotion Regulation Questionnaire (CERQ) Assessment of rumination was realized with the CERQ, developed by (CERQ; Garnefski, Kraaij, & Spinhoven, 2001) which consists of 36 items and 9 conceptually different subscales: each subscale consists of four items. In the CERQ, the rumination subscale refers to extensive thinking about the feelings and thoughts associated with negative events (e.g., “I am preoccupied with what I think and feel what I have experienced” or “I want to understand why I feel the way I do about what I have experienced”). The items have a five-point Likert scale (“never” to “always”), and a high score refers to the frequent use of rumination as a coping strategy.	▪ The ruminative process is thought to have an avoidant function ▪ The ruminative process appears to be voluntary (used as a coping strategy)

