

Linguistic Context Sensitivity as a Predictor of Prolonged Grief Symptoms

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ABSTRACT

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Following the loss of a loved one, grief is a near-universal experience. While most grieving individuals are able to cope effectively and return to baseline functioning over time, some develop persistent complex bereavement disorder (PCBD). This dissertation aims to elucidate the ways in which cognitive and emotional processing go awry in the context of PCBD. More specifically, it examines the relationship between the types of language that bereaved individuals use and their trajectories of adjustment in the first year following a loss. In particular, this dissertation examines *context sensitivity* in word use. *Context sensitivity* describes the degree to which an individual is attuned to the particular demands of a given task or situation. In the present study, linguistic *context-sensitivity* was measured by analyzing the use of words pertaining to certain categories within specific contexts (e.g., participants were asked to discuss a recent positive event, and the use of positive emotion words within their responses was analyzed). Results indicated that, among those individuals who display high levels of grief immediately following the loss of their spouse, the use of *context-sensitive* language predicted a favorable course of adjustment in the first year of bereavement with low levels of grief at one-year post-loss. Conversely, the use of *context-insensitive* language predicted high levels of grief at one-year post-loss. These findings indicate that *context sensitivity* may be instrumental in the development of PCBD and, as such, may help predict an individual's course of adjustment immediately following a significant loss. A better understanding of these early signs of PCBD may greatly assist in the timely detection of the disorder so that intervention may be most

effective. Furthermore, this field of inquiry also has the potential to deeply inform treatment modalities designed to help individuals cope in the wake of bereavement.

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Introduction

Nearly everyone will experience the loss of a loved one over the course of their lifetime. Grief is common, and in many ways it is a normative experience following a loss (Shear, et al, 2011). While the majority of bereaved individuals will eventually return to baseline levels of wellbeing, some continue to struggle for years as ongoing grief impedes their functioning (Prigerson, et al., 2009). A growing body of research is examining the phenomenology of intractable grief and asking who it affects, and why. However, little is known about the genesis of prolonged grief or the factors that might inform its development and predict its course. One promising area of study has focused on context sensitivity. A growing number of studies have linked the failure to modify behavior, or context insensitivity, to the development and maintenance of psychopathology (Bylsma, Morris & Rottenberg, 2007; Ellis, Beevers & Wells, 2009; Kring, 2008; Larson, Nitschke & Davidson, 2007; Rottenberg, Gross & Gotlib, 2005; Shestyuk, Deldin, Brand & Deveney, 2005), including prolonged grief symptoms (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014). Context sensitivity is defined as the ability to accurately perceive the demands and opportunities of a given situation, and it is a key component to effective emotion regulation (Bonanno & Burton, 2013). In the present study, we will aim to examine early linguistic predictors of context sensitivity and their relation to later prolonged grief symptoms.

Prolonged Grief

The prevalent bereavement theory once held that grief is characterized by uniform stages that all individuals experience (Kübler-Ross, 1973). More recently, research has shown that individuals' responses to the loss of a loved one are remarkably varied (Bonanno, et al., 2002;

Bonanno, 2004). Longitudinal research has repeatedly shown that there are distinct, heterogeneous patterns of adjustment in the months and years following a loss (Bonanno, Moskowitz & Papa, 2005; Galatzer-Levy & Bonanno, 2012; Maccallum, Galatzer-Levy & Bonanno, 2015). For example, Maccallum and colleagues (2015) recently analyzed a sample of 2512 bereaved adults who had lost a spouse or child. Among these individuals, they identified four distinct patterns of adjustment: Resilience (little to no distress), Chronic Grief (ongoing distress), Depressed-Improved (distress that remits), and Pre-existing Chronic Depression (distress that predates the loss). The majority (68.2%) of individuals in the sample followed the resilient trajectory, while a much smaller percentage (13.2%) followed the chronic grief trajectory. Additional studies of ongoing grief have estimated prevalence to be between 7.6% and 10% of individuals (Maciejewski, Maercker, Boelen & Prigerson, 2016; Nielsen, et al., 2017). The data suggest that there are no uniform stages to grief, and that for some individuals there is no clear endpoint. Since these individuals are prone to suffering without relief, it is relevant to ask who they are and how they might be identified early in the grieving process.

The concept of prolonged grief has long been conflated with depression and posttraumatic stress disorder (Bonanno, et al., 2007). Bereavement is included in the Diagnostic and Statistical Manual- Fourth Edition (DSM-IV; American Psychiatric Association, 2000) and persistent complex bereavement disorder is included in the DSM-5 (American Psychiatric Association, 2013), yet due to a lack of consensus regarding phenomenology, they are listed as addenda rather than formal diagnostic categories. A robust body of research suggests, however, that prolonged grief is a unique and valid construct that differs in phenomenology from both depression and PTSD (Bonanno, et al., 2007; Denckla, Mancini, Bornstein & Bonanno, 2011; Dillen, Fontaine & Verhofstadt-Deneve, 2008; Lotterman, Bonanno & Galatzer-Levy, 2014;

Maccallum, Malgaroli & Bonanno, 2017). Several core symptoms suggest that prolonged grief is distinct from other forms of psychopathology, including persistent yearning for the deceased, confusion about one's identity, bitterness / anger about the death, difficulty trusting other people, feeling shocked and stunned by the death, and difficulty accepting the loss (Mccallum, et al., 2017; Shear, 2015).

Prolonged grief has been associated with a number of detrimental outcomes including poor physical health (Shahar, Schultz, Shahar & Wing, 2001; Stroebe, Schut & Stroebe, 2007), worsening of preexisting mental health problems (Shear, et al., 2011), high risk of suicide (Agerbo, 2005; Li, 1995; Prigerson, 1999; Qin, Agerbo & Mortensen, 2003), and mortality (Christakis & Allison, 2006). Yet despite the heavy toll exerted by prolonged grief, much remains unknown about the phenomenology of the disorder. Given that the field of study is still nascent and there are significant gaps in our knowledge, further research is imperative.

A promising field of research has begun to examine the role of context sensitivity in the development of prolonged grief symptoms. Context sensitivity describes one's ability to adequately perceive the contextual demands of a given situation, and is an essential step in the effective regulation of emotion (Bonanno & Burton, 2013). Empirical work in context sensitivity and bereavement is limited, but previous findings suggest that context insensitivity is a predictor of symptoms of distress following a loss (Coifman & Bonanno, 2010) and, as such, can help differentiate between those who continue to struggle following a loss and those who do not (Diminich & Bonanno, 2014). The current study will aim to expand on these findings by examining context-sensitive word use among recently bereaved individuals. This study will be the first to conduct a broad linguistic analysis of word use across a range of participant narratives, both affective and non-affective, loss and non-loss topics. Open-ended narratives are

an especially powerful research tool as they provide direct access to individuals' thought processes and content (Keats, 2009). This study will ask whether, in the cases where individuals do not express what the context asks them to express, there is greater development of long-term grief symptoms.

Context Sensitivity

The ability to effectively regulate emotions is key to psychological equanimity. Early emotion regulation theorists made categorical distinctions between purportedly adaptive regulation strategies, such as reappraisal, and maladaptive regulation strategies, such as suppression (Gross, 1998). More recently, research has begun to explore the role of context in emotion regulation, and has underscored the importance of situational factors (Aldao, 2013; Bonanno & Burton, 2013; McGreevy, Bonanno & D'Andrea, 2015). The term *context sensitivity* describes the ability to perceive the demands and opportunities of a given situation (Bonanno & Burton, 2013; Coifman & Bonanno, 2009). Context sensitivity is a key step in effective emotion regulation, as attunement to situational demands helps to guide an individual's selection of regulatory strategy (Bonanno & Burton, 2013). Sensitivity to context permits flexibility in responding, and allows for the selection of the most adaptive regulation strategy in any given situation (Bonanno & Burton, 2013). Previous research has demonstrated that the accurate perception of contextual demands is associated with more effective emotion regulation and, in turn, enhanced psychological wellbeing (Cheng, et al, 2012; Troy, Shallcross & Mauss, 2013). Conversely, the inability to read contextual cues has been associated with static, inflexible responding and maladaptive emotional responding (Kring, 2008). When an individual cannot accurately read the contextual demands of a given situation, his or her emotional response to the situation is often aberrant. As a result, there may be psychological or interpersonal costs to this

ineffective regulation (Cole, et al., 1994). For example, children who display signs of happiness during aggressive activities have low levels of acceptance among peers, likely because these peers find context-incongruent displays of emotion to be off-putting (Arsenio, Cooperman & Lover, 2000).

A growing body of research is investigating the role of context-insensitivity in psychopathology. Much of this research has focused on insensitivity as it manifests in depression and anxiety. Depressed individuals have shown decreased responsivity to negative stimuli (Ellis, et al., 2009; Rottenberg, et al., 2005) and, in many cases, to positive stimuli as well (Bylsma, et al., 2007; Larson, et al., 2007; Rottenberg, et al., 2005; Shestyuk, et al., 2005). Similar effects have been observed among individuals with anxiety, who show biases toward fear responses regardless of context (Larson, et al., 2007; Mennin, Heimberg, Turk & Fresco, 2005).

Disturbances in context sensitivity and emotion regulation capacity extend well beyond depression and anxiety, however (Cole, et al., 1994). While taking a *transdiagnostic* approach, some researchers posit that deficits in regulatory capacities underlie and connect many forms of psychopathology (Kring, 2008). In addition to cognitive processes (Coifman & Bonanno, 2009), biological mechanisms, such as elevated cortisol levels, have been implicated in context *insensitivity* (Buss, Davidson, Kalin & Goldsmith, 2004; Larson, et al., 2007; Myruski, Bonanno, Gulyayeva, Egan, Dennis- Tiwary, 2017). Furthermore, several neural substrates, including decreased hippocampal neurogenesis and reduced serotonin neurotransmission, have been identified (Davidson, Jackson & Kalin, 2000; Davidson, Putnam & Larson, 2000; Johnson 2003). Using this transdiagnostic framework, it stands to reason that context-insensitivity may also be implicated in prolonged grief (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014).

In several studies, performance on context sensitivity tasks has predicted long-term outcomes on measures of adjustment and wellbeing. Bonanno and colleagues (2004) interviewed female survivors of childhood sexual abuse and asked them to describe a distressing event, and participants' facial expressions were coded using the Facial Action Coding System (FACS). Those participants who expressed positive emotion while describing an abuse event (i.e., displaying a context-*insensitive* response) showed poor social adjustment two years after the initial interview. Similarly, Harvey and colleagues (2016) interviewed participants with Thalassemia (a congenital blood disorder) about their illness and coping styles. The researchers asked participants two open-ended questions, and responses were analyzed for frequency of negative and positive emotional word use. In response to the first question, which required participants to discuss their illness, the researchers expected the use of many negative emotion words. In response to the second question, which required participants to discuss their modes of coping, the researchers expected the use of many positive emotion words. Results showed that context-sensitive emotion word use (i.e., the use of many negative-emotion words in the first narrative and many positive-emotion words in the second narrative) predicted adherence to treatment and essential health screenings over the following year. The construct of context sensitivity has not only been used as a correlate of psychopathology in cross-sectional studies, but has also been used in longitudinal studies to predict long-term outcomes.

Due to the persistent nature of prolonged grief, the prediction of long-term outcome is central to this research (Galatzer-Levy & Bonanno, 2012; Lotterman, et al., 2014; Maccallum, et al., 2015). Since the field of study is still emergent, it is not yet entirely clear who among the bereaved will develop the condition. Research has begun, however, to explore the role of context sensitivity in the prediction of outcome following the loss of a loved one. Coifman and Bonanno

(2010) interviewed 48 bereaved adults who had lost a spouse or child four months prior, and asked them to discuss a recent positive event and a recent negative event. Both of the events described were unrelated to the participants' losses. Independent coders provided ratings of participants' positive and negative emotions based on facial expressions, and symptoms of depression were measured at four months and 18 months post-loss. Results indicated that, among those who experienced high levels of distress at four month post-loss, context sensitivity (defined as the use of negative facial expressions while discussing a recent negative event) predicted lower levels of depression at 18 months post-loss. The researchers conclude that the ability to flexibly shift displays of emotion between narrative contexts was predictive of depression remission between the two points of measurement. Similarly, in a sample of 60 adults who had lost a spouse 1.5 to 3 years previously, Diminich and Bonanno (2014) examined the relationship between prolonged grief and context sensitivity. They also used open-ended interview questions, and asked participants to discuss instances of conflict and intimacy with their late spouse as well as with another significant person in their lives. The researchers measured emotional responding through self-reported affect, facial expressions, and emotion word use during the interviews. Results showed that those participants with prolonged grief displayed less emotional expressivity across narratives, and were thereby less context-sensitive than those without prolonged grief. These individuals displayed fewer genuine (Duchenne) smiles while describing moments of intimacy with their spouses, and the researchers hypothesize that, consistent with the diagnostic criteria for prolonged grief, they experienced more difficulty gaining comfort from these memories.

Context sensitivity is a transdiagnostic construct that has been implicated in a broad range of psychological disorders. As such, it holds promise as a tool that may help determine how individuals will respond to a stressful life event such as bereavement.

Narrative Research

Idiographic narratives are a rich and unique source of psychological data (Barlow & Nock, 2009; Kirkman, 2002; Thomas, et al., 2009). Narratives convey information about an individual's identity, perspective, and choices and help construct vivid and detailed depictions of one's experience (Keats, 2009). Narratives are valuable not only for the subject matter they communicate, but also for the ways in which the speaker chooses to impart the information (Tausczik & Pennebaker, 2010). Aside from the words spoken, storytellers convey information regarding their emotions, motivations, and cognition (Birren, 1996; Spector-Mersel, 2010). In addition, storytellers may weave together events from the past, present and future to relate systems of meaning-making and attributions (Freeman, 1993; Spector-Mersel, 2010). Narratives not only capture this information about an individual's interior world, but also convey important information about the context in which the individual functions (Moen, 2006). In this manner, listeners may also glean a great deal about a storyteller's social and cultural milieu (Moen, 2006). In many ways, we both construct and relate our realities through storytelling, which makes idiographic narratives a valuable source of information for psychological research (Keats, 2009).

In research on trauma and loss, narrative methodologies have provided particularly relevant data (Bauer & Bonanno, 2001; Capps & Bonanno, 2000; Jelinek, et al., 2010; Jones, Harvey & Brewin, 2007). Extremely adverse life events may be followed by difficulties with coping and meaning-making (Park, 2010). Often these difficulties are related to problems with

long-term adjustment and ongoing psychopathology (Davis, Nolen-Hoeksema & Larson, 1998). The use of idiographic interviews in bereavement studies has allowed researchers to examine several factors that relate to symptoms of prolonged grief (Bauer & Bonanno, 2001; Capps & Bonanno, 2000). By using narratives, these researchers have been able to study phenomena that would have been difficult to assess using self-report measures or structured interviews (Barlow, 2009). Capps and Bonanno (2000) conducted interviews with 44 individuals who had lost a spouse within the previous three to six months. These participants were asked to speak about their relationship with the deceased as well as their experience of loss, and their narratives were analyzed and coded for degree of agency expressed. Results showed that those who depicted themselves as having diminished agentic roles (i.e, they felt themselves to be passive, unable to act, or with an external locus of control) displayed more symptoms of grief in a two-year post-loss assessment. Similarly, Bauer and Bonanno (2001) interviewed participants who had lost a spouse three to six months prior, and asked them to speak about their relationship with the deceased. These interviews were transcribed, and narrative units were coded for negative self-evaluations and the expression of self-efficacy. Results showed that high evaluations of self-efficacy predicted lower levels of grief over the course of 6, 14, and 25 months post-loss. Not only does narrative data provide unique information about an individual's cognitive and emotional functioning, it has also demonstrated the potential to predict outcome following adverse life events (Bauer & Bonanno, 2001; Capps & Bonanno, 2000).

In the field of narrative studies, text analysis is a particularly powerful research tool. Whereas much narrative research relies on qualitative methods, the use of text analysis enhances the validity and scope of this research by permitting quantitative analyses of relevant variables (Pennebaker, et al., 2015; Tausczik & Pennebaker, 2010). Text analysis has been used to

differentiate between clinical and non-clinical populations by analyzing patterns of word use. The majority of these studies have examined differential responses to traumatic events in attempts to identify linguistic markers of acute stress and posttraumatic stress disorder (Jelinek, et al., 2010; Jones, et al., 2007; Margola, et al., 2010). For example, Jelinek (2010) asked trauma survivors to describe the “worst” moment of a traumatic incident, and found that those participants with PTSD showed lower levels of cognitive processing, had more unfinished thoughts, and used the present tense more often than those participants who did not have PTSD. Similarly, Jones (2007) interviewed survivors of motor vehicle accidents and saw that those with acute stress disorder and posttraumatic stress disorder used more sensory words, repetitions, and non-consecutive chunks than less symptomatic participants. Margola (2010) asked students to write about their experiences after the death of a classmate and found that those with poorer adjustment used more negative emotion words and self-referential words. Fewer studies have used text analysis to examine patterns of word use among the bereaved. Diminich and Bonanno (2014) found that individuals with prolonged grief used more negative emotion words than those without prolonged grief and, furthermore, these participants used negative emotion words while discussing instances of both conflict and intimacy with the deceased. Eggly and colleagues (2015) used text analysis to examine emotion words use among bereaved parents who met with physicians who had cared for their children. The researchers found that the parents’ use of positive emotion words increased over the courses of the session, which they attribute to the opportunity to work toward making sense of the loss.

In addition to research differentiating between clinical and nonclinical populations, text analysis has been used to link linguistic variables to long-term outcomes (Alvarez-Conrad, et al., 2001; Cohn, Mehl & Pennebaker, 2004; Harvey, et al., 2016; Jones, et al., 2007; Margola, et al.,

2010). In a sample of female assault victims, Alvarez-Conrad (2001) found that the use of more words related to death and dying during prolonged exposure therapy predicted worse post-treatment outcomes. Similarly, Cohn (2004) analyzed entries from online journal users in the weeks before and after 9/11, and found that participants who were especially occupied with the attack used many negative emotion words and displayed much psychological distancing in their writing. Harvey (2016) used text analysis to analyze interviews with patients being treated for the disease Thalassemia, and found that the use of context-sensitive emotion words predicted medical treatment adherence.

Text analysis methods have been used to detect differential word usage among clinical and nonclinical populations (Jelinek, et al., 2010; Jones, et al., 2007; Margola, et al., 2010), as well as to predict long-term outcomes following stressful life events (Alvarez-Conrad et al., 2001; Harvey, et al. 2016). Research analyzing word use among bereaved populations (Diminich & Bonanno, 2014; Eggly, et al., 2015) is more nascent, however, and remains a promising field of inquiry.

The Present Study

The present study is the first to examine whether context-sensitive word use immediately following the loss of a loved one predicts symptoms of grief at one-year post-loss. We hypothesized that context-congruent word use early in bereavement would predict lower levels of grief one year later. In order to evaluate this hypothesis, we used transcriptions of open-ended, idiographic interviews conducted at approximately three-months post-loss with individuals who recently lost a spouse. We examined several specific categories of word use across six narrative conditions, and analyzed the relationship between these word categories and symptoms of grief at 14-months post-loss.

For the first two interview questions, we asked participants to describe a recent positive event and a recent negative event, both unrelated to the loss. We expected that individuals would tend to use positive emotion words in the Positive Narrative and negative emotion words in the Negative Narrative, and hypothesized that this context-congruent word use would predict low levels of grief at 14-months post-loss.

In the third and fourth narratives, participants described a moment of conflict and a moment of intimacy with their late spouses. We expected that they would tend to use social words in both narratives, and that they would tend to use anger words in the Conflict Narrative. We expected that this context-congruent word use would predict low levels of grief at 14-months post-loss.

In the fifth and sixth narratives, participants described their relationships as well as their experiences of loss. Preliminary analyses revealed the Loss Narrative to be heterogeneous, and no clear context-congruent categories emerged. For this reason, we used data from this narrative as a control condition for the Relationship Narrative. In the Relationship Narrative, we expected that individuals would tend to use 'we'-type words, and that the use of these context-congruent words would predict low levels of grief at 14-months post-loss. Conversely, we considered the use of present-tense words and death-related words in the Relationship Narrative to be context-*incongruent*. Since the relationship was in the past and had a definite end-point, we would not expect to hear the use of present-tense words in describing it. Similarly, since the relationship predated the loss, we would not expect to hear the use of death-related words in describing it. We hypothesized that the use of these context-*incongruent* word categories would predict higher levels of grief at one-year post-loss.

In addition to these primary inquiries, we conducted exploratory analyses for several additional research questions. First, we aimed to construct a variable of overall linguistic context sensitivity, and to determine whether there was a relationship between this variable and symptoms of grief at one year post-loss. Given the frequent conflation of persistent complex bereavement disorder with depression and PTSD, we also aimed to determine whether there was a significant relationship between this linguistic context sensitivity variable and symptoms of depression and PTSD at one-year post-loss.

Our lab has also studied a phenomenon called *expressive flexibility* which, broadly, is the ability to modulate one's display of emotion to meet situational demands (Gupta & Bonanno, 2010). Given that research has linked expressive flexibility to a favorable course of adjustment during bereavement, we aimed to determine whether there is a relationship between expressive flexibility and linguistic context sensitivity. We also aimed to study the potential relationship between the linguistic context sensitivity of a speaker (in this case, the individual telling a narrative) and the extent to which the individual listening finds the speaker to be likeable.

Finally, the majority of our analyses examined the relationship between early context sensitivity and later symptoms of grief. We also aimed to examine the converse, and to ask whether early symptoms of grief significantly predict linguistic context sensitivity at one-year post-loss.

Method

Data

The present study used data from the Project to Understand Reactions to Loss (PURL-II) to examine the relationship between linguistic context sensitivity and symptoms of prolonged

grief. The PURL-II is a longitudinal study of spousal bereavement that involved the collection of data at three months (Time 1) and 13-15 months (Time 2) post-loss.

Participants and Procedure

Recently bereaved individuals were identified through public obituaries and were invited via mail to participate in the study. Inclusion criteria required that participants be between 25 and 65 years of age, and to have recently lost a spouse or domestic partner. The current sample consists of 176 individuals who ranged in age from 34 to 65 ($M= 55.15$, $SD= 7.19$). Sixty-three percent of participants were women, while 37% were men. The majority of participants were Caucasian (89%), while 5% were African-American, 3% were Asian-American, 2% were American Indian / Alaskan Native, 0.5% Pacific Islander, and 0.5% other. Sixty-four percent of the sample was employed full-time, 15% were employed part-time, and 21% were unemployed. The mean length of marriage / partnership was 24.16 years ($SD= 10.00$).

Once enrolled, participants visited our laboratory at three-months post-loss and engaged in a number of tasks. These tasks included idiographic interviews about positive and negative non-loss topics, the relationship with the deceased, the experience of loss, moments of conflict and intimacy with the deceased. Participants also engaged in an expressive flexibility task and were administered structured clinical interviews to assess for symptoms corresponding to major depressive disorder, posttraumatic stress disorder (PTSD), and persistent complex bereavement disorder (PCBD). Participants returned to the lab between 13 and 15 months post-loss and repeated the same idiographic interviews as well as structured interview to assess symptoms of psychopathology. Participants were compensated \$100 for each of their visits to the lab.

Structured Clinical Interview for Grief Symptoms

During both points of data collection, participants were administered a structured clinical interview that assessed for core criteria symptoms of major depressive disorder, posttraumatic stress disorder, and persistent complex bereavement disorder as described in DSM-5 (American Psychiatric Association, 2013). Additional grief-related items were adapted from a grief-specific structured interview (Bonanno, Keltner, Holen & Horowitz, 1995), including items from the Structured Clinical Interview for Complicated Grief (SCI-CG; Bui, et al., 2015). Advanced doctoral students in clinical psychology conducted the interviews, and scored the 22 items (see Appendix 1) on a 1-3 scale (1= symptom absent, 2= criterion suggested but not fully met, 3= full manifestation of diagnostic criterion). These scores were then used dichotomically with 0 indicating that the criterion was absent or not fully met, and 1 indicating that the criterion was entirely present. Grief, depression, and PTSD scores were calculated by tallying the number of criteria fully met. According to the initial scoring scale, the interclass correlation ($ICC = .94$) was very high for absolute agreement (the ICC was computed not only for correlation but for exact same scores), and inter-rater reliability for the interview binary scores was high as well (average $K = .87$).

Idiographic Interviews

During their first visit to the lab, participants engaged in six idiographic interviews. They were read a script informing them that they would be asked several open-ended interviews and that they may “respond in any way they wish,” and that they should “relate as openly as possible whatever comes to mind in response to the question.” They were also informed that they would be given a specified period of time to respond.

Positive and Negative Narratives: For these narratives, participants were given three minutes to respond to each question. For the Negative Narrative, they were asked first to recall a negative event that had transpired sometime in the previous month that was unrelated to the loss of their spouse. For the Positive Narrative, they were asked to recall a positive event from the past month that was unrelated to their spouse.

Conflict and Intimacy: For the Conflict Narrative, participants were asked to recall an event in which they were involved in an emotional conflict with their late spouse, and were given three minutes to respond. For the Intimacy Narrative, they were asked to recall an event in which they felt very close to their spouse, and were also given three minutes to respond.

Relationship Narrative: Participants were given six minutes to respond to the question, “I’d like you to please tell me what the relationship was like.”

Loss Narrative: Participants were asked to describe the loss and what their lives have been like since the loss, and they were given six minutes to respond.

The interviews were videotaped, and were later transcribed by a team of research assistants in order to be analyzed for content.

Likeability

Upon completing the interview, the interviewer was asked to rate the extent to which they “liked the participant as a person” using a 7-point Likert-type scale [1= less than others (not at all), 4= about the same as others (moderately), 7= more than others (very much)]. Interviewers were also instructed: “Your rating for this item should reflect your honest subjective response, and should be as independent as possible from your clinical judgment.” A team of research assistants watched videos of the idiographic interviews in order to transcribe them, and these

research assistants were given the same instructions for providing ratings of participant likeability. In addition, the research assistants crosschecked each other's work by viewing the videos while reading the transcriptions, and those who reviewed the transcriptions were also asked to provide ratings of participant likeability. Collectively, these ratings yielded three separate measures of likeability: those of the interviewer, transcriber, and transcription reviewer. An average rating of likeability was also calculated.

Text Analysis

Linguistic Inquiry and Word Count (LIWC) is a text analysis application that allows quantitative analyses of word use in written text (Pennebaker, 1993). The most updated version of the program, LIWC2015, consists of nearly 6400 words, word stems, and select emoticons (Pennebaker, Boyd, Jordan & Blackburn, 2015). For each segment of text analyzed, LIWC outputs 90 variables that include word categories tapping psychological processes (e.g., affect, cognition, and perceptual processes)(Pennebaker, et al., 2015). For the current study, narrative transcriptions were run through the LIWC program in order to generate the linguistic variables of interest. These variables include positive emotion words (e.g., love, nice, sweet), negative emotion words (e.g., hurt, ugly, nasty), anger words (e.g., hate, kill, annoy), social words (e.g., friend, talk, they), death words (e.g., bury, coffin, kill), use of the word "we" words (e.g., we, us, our) and present-focus words (e.g., today, is, now). (Pennebaker, et al., 2015). For each word category, LIWC calculates the percent (0.00 through 100.00) of total words in the narrative that the category comprises.

We selected six word categories that we considered to be context-congruent, and two word categories that we considered to be context-*incongruent*. The context-congruent categories are: positive emotion words in the Positive Narrative, negative emotion words in the Negative

Narrative, social words in the Intimacy and Conflict Narratives, anger words in the Conflict Narrative, and ‘we’ words in the Relationship Narrative. The context-*incongruent* categories are death-related words and present-tense words in the Relationship Narrative. We selected these word categories by reviewing the narratives to identify emergent themes, and consulting available literature on word use in contexts related to those in our study.

Expressive Flexibility

During their first visit to the lab, participants also underwent an expressive flexibility task. For this task, they sat at a desktop computer with a camera that focused on their faces. In order to orient them to the task, they were told that they would be viewing a set of “highly emotional images,” some positive and some negative. They were told that an “X” would appear briefly on the screen before the image appeared, and that they should focus on the X while waiting for the picture. These images came from the International Affective Picture Ratings System (IAPS; Lang, Bradley & Cuthbert, 1995), and were presented in blocks of five pictures with each presented for seven seconds and four seconds between pictures. The participants were also told that, during the task, someone in a separate room would be watching them through the monitor while trying to guess their emotions. They were further told that they would be given three sets of instructions: at times, they would be told to enhance their reaction to the photos, at times they would be told to suppress their reactions to the photos, and at times the monitor would be turned off, and they should react naturally to the photos.

Participants underwent six blocks of trials (enhancement, suppression, and natural expression), which were randomized for order. For half of these trials (one enhancement, one suppression, and one natural expression), participants were shown a subliminal prime that consisted of scrambled letters of their spouse’s name presented for 20 milliseconds after the

presentation of the X and prior to the presentation of the image. These videos were later viewed and coded by a team of graduate students who were unaware of the task objectives. These students rated participants' expression of positive and negative emotion using a 7-point Likert-type scale (e.g., for positive emotion, 1= no positive emotion, 4= moderate positive emotion, 7= extreme positive emotion). Each video was coded by three individuals, and final scores were calculated by taking the average of these scores.

In order to calculate overall expressive flexibility scores for the two conditions (with and without the spouse's name as a prime), enhancement condition and the suppression condition were calculated. The enhancement score was calculated by subtracting the neutral score from the average enhancement score, while the suppression score was calculated by subtracting the average suppression score from the neutral score. The enhancement score and the suppression score were then summed. The absolute difference between the enhancement score and the suppression score was then calculated in order to determine *polarity*. Finally, the *polarity* was subtracted from the sum of expression and suppression scores in order to generate an overall expressive flexibility score for both the spouse (with prime) and neutral (without prime) conditions.

Analyses

Our primary research questions ask whether the use of context-sensitive words at T1 (three-months post-loss) predicts grief symptomatology at T2 (13-15 months post-loss). The majority of bereaved individuals, however, follow a resilient trajectory characterized by low levels of symptomatology both immediately following and in the years after a loss (Galatzer-Levy & Bonanno, 2012; Lotterman, et al., 2014; Maccallum, et al., 2015). The prediction of outcome is less relevant for these individuals since early, low levels of grief are most commonly

associated with an asymptomatic trajectory over time (Bonanno, 2004). Since resilient individuals are unlikely to change in terms of symptom presentation, the examination of context sensitivity is less relevant to this population. The present study aimed to examine the relationship between early context sensitivity and grief at T2 specifically among those participants who displayed high levels of early grief at T1. A series of hierarchical regressions was conducted in which grief symptomatology at T2 (defined as the sum of relevant grief symptoms from the structured clinical interview) was regressed on word category frequencies (for example, the percent, 0.00 – 100.00, that positive emotion words comprise of a given narrative) and grief symptomatology at T1 (defined as the sum of relevant grief symptoms from the structured clinical interview). In these regressions, an interaction variable of word category frequency multiplied by grief symptoms at T1 was entered as a final step. The use of the interaction term permitted the examination of the relationship between context-sensitive word use and grief at T2 specifically among those participants who displayed high levels of grief at T1. Coifman and Bonanno (2010) previously employed this data analysis strategy in their study of context-sensitive facial expressions and prolonged grief.

We looked specifically at context-congruent and *-incongruent* word use across six narrative conditions. Two of these conditions were affective, non-loss topics in which participants were asked to describe recent positive and negative events. In each of these conditions, we examined the use of positive emotion words when describing a positive event and the use of negative emotion words when describing a negative event. We expected the use of these context-sensitive words would predict a favorable outcome in the first year of bereavement. We examined each of these word types (positive emotion words and negative emotion words) in each context (positive event and negative event), and we also constructed a *valence context*

sensitivity variable in order to examine the effects of both types of context-congruent word types simultaneously. The following excerpt exemplifies the use of many positive emotion words within the Positive Narrative, which constitutes context-sensitive word use:

*“I got some additional business... I am a banker and I won three new deals. And so I was **pleased**. And then I also had another firm express interest in working with me. So, you know, those were **good** things. Getting additional business, winning business, it was all **good**. I felt **happy**, I felt **gratified**, I felt **confident** about the future, and just **pleased** that clients continue to have **confidence** in me.”*

The following excerpt demonstrates the use of few positive emotion words in the Positive Narrative, which we consider to represent context-*insensitivity*:

“When I came home, all my three kids had been at home alone, and historically...we couldn't leave my oldest two sons together, because my oldest son, he's a piece of work... he has historically been very mean to his... his family, frankly, but specifically to my middle son. He's been a jerk to him, and they have clashed for years, and we couldn't leave them alone.... But things didn't fall apart. They dealt with the fact that I was later than usual, that I didn't get home in time to feed them like I usually do, which could cause issues. They interacted well with one another.”

The context-sensitive excerpt below demonstrates the use of many negative emotion words in the Negative Narrative:

*“While I was out of work, there were some problems involved with someone trying to fill in for me. So when I went back, I had to clean up some issues. When I was asking my manager and the person who was filling in for me, I didn't quite understand what happened or why it happened... and they jumped down my throat and they were like, “Well, you weren't here and I didn't know what to do”... and it was really **upsetting** because I just thought they were kind of **attacking** me. I didn't quite understand their reactions so it was **upsetting** to me because I just didn't think they were treating me right, and it was a mess. I went into another area and I just started **crying** because I felt very, very **upset** that I couldn't handle it and they weren't being very sympathetic.”*

There are few negative emotion words in the following context-*insensitive* excerpt of a Negative Narrative:

“My mother, her cancer has reoccurred. And so we went away for a couple weeks as a family and that was kind of a weird experience because... actually, I don't need to get into the details of all of that. But then she had to start chemotherapy right away. And it spread, and she has to have

indefinite treatment. Which is what my husband had. And she has to go every week... I don't know how she's going to tolerate every week... I guess I'm doing okay, I don't know."

In the third and fourth sets of narratives, participants were asked to describe moments of conflict and intimacy with their deceased spouses. In these narratives, we examined the use of anger words and social words. We considered the use of anger words in the Conflict Narrative and the use of social words in both the Conflict and Intimacy Narratives to be context-congruent. We expected that the use of these context-congruent words would predict a favorable outcome in the first year post-loss. The following context-sensitive excerpt from a Conflict Narrative demonstrates the use of many social words:

*"We were **engaged** and ... my mother was a pain... and kind of threw a bunch of wrenches into the wedding. So literally the day after the invitations went out I said, 'Wedding is off. I want to **marry** you, but I don't want to get **married** under these circumstances.' She freaked out, but she understood. I think it really actually helped **us** grow up a lot as young adults because rather than being guided by **our** parents ... **we** became like, 'You know what? ... **We** have to work out **ourselves** how we want to better live **our** lives and how we want to move forward."*

In the following excerpt of a Conflict Narrative, the speaker used very few social words, which we constitutes context-insensitive word use:

"There was some infidelity, so that was... a breaking point and... started a permanent state of distrust in me, and that was something that I couldn't really overcome... I don't know how people overcome it, maybe they do...but it was a real breaking point and it was terrible and it seemed unsolvable...we got past it, but it wasn't ever the same."

This context-sensitive excerpt from an Intimacy Narrative demonstrates the use of many social words:

*"We went to my sister's wedding... beautiful restaurant, beautiful hall, terrific band. **We** kind of decided with each other that... this was going to be **our** wedding again. Without telling anybody, **we** were going to treat this like **our** wedding day even though it was theirs. **We** didn't tell anybody... but **we talked** to and treated **each other** as though it was our own wedding day it was very **intimate**, very special, for both of us... we danced and we **hugged** and we were very much in love that night."*

This context-*insensitive* excerpt from an Intimacy Narrative demonstrated the use of few social words:

“When I lost my job, I kind of knew it was coming because they were laying people off. I was devastated when it happened... but, I’m not one for crying. I stay on my own two feet and I’m very strong and I don’t really need all that emotional support. But when this happened, I was devastated. I was crying and... he was so supportive of me and I remember he was hugging me and I wanted to be hugged...normally I would like push him away or whatever...we were just like that-- not in the beginning, but that’s just how we got.”

The following context-sensitive segment from a Conflict Narrative exemplifies the use of many anger words:

*“I came home one night and he, he wasn’t supposed to eat some things, and mayonnaise was one of those things... he came home with a sandwich and he was sitting at the table with a jar of mayonnaise out slathering it on the bread... I yelled at him... I was very **annoyed** with him, extremely **annoyed** that, um, he just kept eating the mayonnaise... he passed away on Saturday, that happened on Thursday, that stays in my mind... Friday was a Jewish holiday, so it was a fasting holiday, that was probably his last meal and I was **yelling** at him about it... [he] was very **anti-adversarial**, so **conflicts** were usually one-sided—me... I would be **aggravated** with something, that’s it.”*

The following context-*insensitive* narrative demonstrates the use of few anger words in the Conflict Narrative:

“She was already diagnosed with cancer and I didn’t see a reason for her to have a new car. She was on a lot of medication at the time, barely able to drive and she wanted to get this new car... I told her my feelings about not me wanting her to get the car and she said she wanted to get it anyway... I just told her how I felt about getting the car, and then she had the car for three months more and she couldn’t drive anymore. We paid for the lease of the car for the next 15 months and then when she passed away. I got rid of it, gave it back. That was... a conflict because we had to pay for the car for all those months and she...couldn’t even use it.”

In the fifth and sixth sets of narratives, participants were asked to discuss their relationships with their deceased spouses as well as their experiences of loss. We looked specifically at context-congruent word use in the Relationship Narrative, as the Loss Narratives were markedly heterogeneous. We considered the use of many ‘we’-type words to be context-congruent, since the interview prompts asked participants to describe the relationship with

another person. Below is an excerpt of a Relationship Narrative in which the use of ‘we’ words is prevalent:

*“He was my best friend. **We** did everything together; **we** loved to travel, **we** traveled as much as **we** could, **we** didn’t save any money, **we** just wanted to live... almost like **we** knew that **we** needed to live... **we** had a lot of fun, **we** went to a lot of places, and **we** took the kids whenever we could, because **we** liked hanging out with them too... **we** were always happy, **we** were always doing stuff that **we** never did before... **we** liked just liked to travel, if **we** could afford it, **we** would go to Mexico on a cruise, and if **we** couldn’t **we’d** just go to Boston or Maine or something. And that was it; and **we** liked to have parties at the house, **we** just liked to have fun.”*

In the following context-insensitive excerpt from a Relationship Narrative, few ‘we’ words are used:

“The relationship was extremely stressful. She had a very serious battle with alcoholism for a long period of time...it created tremendous tension both between she and I and between the functional family unit, her kids, and herself. Um, she showed a lot of favoritism to one of our kids, who were twins, versus the other, which created a lot of anger, and anguish, and animosity...her lack of acknowledging and embracing or taking any degree of responsibility, or proactively trying to improve her condition or the condition of the family made our relationship very, very stressful.”

We considered the use of death-related words in the Relationship Narrative to be context-incongruent since participants were asked to discuss experiences that predated the death of their spouse. Below is an excerpt of a Relationship Narrative that includes the use of many death-related words:

*“When I met [her], it was right after the attacks in 2001. In New York... it was a different place... you didn’t say, “goodbye”, you said, “be safe.” We knew people that **died**. So we met at that time. And meanwhile everybody here was, we were all **grieving** just trying to rekindle a sense of our own identity I guess... and then, of course, she was sick. When I met her, it was in remission and... within months we were skiing and she thought she broke her rib she went in, and cancer was in her bones. That was 2006. And then she **died** in 2013.”*

Similarly, we considered the use of many present-tense words to be context-incongruent since participants were asked to describe an event that was in the past. The following excerpt exemplifies the use of present-tense words in the Relationship Narrative:

“[She] is a very humble person... a very good wife and a mother, hardworking, honest, a very decent person. I love her very much. She goes to the church twice in the morning... Sometimes I go. She doesn’t want any trouble... and at home [she] is very quiet sometimes... when we have an argument... she doesn’t answer, she just looks at me and lets me talk and finish... and sometimes she just cries and doesn’t answer me, and then I give her a hug after that and say I’m sorry, and there is no issue.”

Below is an example of a context-sensitive narrative in which present-tense words and death-related words are *not* prevalent:

“We had a really good relationship... he always said it was his job to keep our feet on the ground and my job to keep our head in the stars, and we did very well... there was a lot of give and take...both of us gave it our all, we worked at everything together, we had a very equal relationship...we could work things out if there were problems. We became very close right at the beginning because we had infertility problems, and for seven years it was our goal and it was something that we did together. I think that that set the tone for our entire marriage: being there for each other supporting each other and working towards something together.”

In the Relationship Narrative, we expected that the use of context-congruent words (i.e., ‘we’ words) would predict a favorable outcome in the first year post-loss, and that the use of context-*incongruent* words (i.e., death words and present-tense words) would predict an unfavorable course of adjustment.

Results

Consistent with the findings of previous studies, 18.2% of the present sample met criteria for persistent complex bereavement disorder at T1, and 15.3% met criteria at T2 (Galatzer-Levy & Bonanno, 2012; Lotterman, et al., 2014; Maccallum, et al., 2015). At T1, the mean sum of PCBD symptoms was 4.50 ($SD= 3.51$, range= 0-14), the mean sum of depression symptoms was 2.91 ($SD= 2.34$, range= 0-9), and the mean sum of PTSD symptoms was 1.94 ($SD= 2.04$, range= 0-9). At T2, the mean sum of PCBD symptoms was 2.52 ($SD= 2.86$, range= 0-13), the mean sum of depression symptoms was 1.62 ($SD= 1.95$, range= 0-8), and the mean sum of PTSD symptoms was 1.50 ($SD= 2.05$, range= 0-9). For word category use frequencies across narratives, see Table 1.

Table 1. Descriptive statistics for word categories and symptom totals

T1 Symptom Total		<i>M</i>	<i>SD</i>
	Prolonged Grief	4.50	3.51
	Depression	2.91	2.34
	PTSD	1.94	2.04
T2 Symptom Total			
	Prolonged Grief	2.52	2.86
	Depression	1.62	1.95
	PTSD	1.50	2.05
T1 Word Category			
Positive emotion words	Positive Narrative	4.28	1.66
	Negative Narrative	1.73	1.10
Negative emotion words	Positive Narrative	0.68	0.63
	Negative Narrative	2.33	1.29
Anger words	Conflict Narrative	0.96	0.90
	Intimacy Narrative	0.12	0.23
Social words	Conflict Narrative	12.57	3.82
	Intimacy Narrative	13.41	3.77
Death-related words	Relationship Narrative	0.15	0.20
	Loss Narrative	0.40	0.43
'We' words	Relationship Narrative	3.91	1.86
	Loss Narrative	0.94	0.72
Present-tense words	Relationship Narrative	7.05	2.07
	Loss Narrative	13.49	3.56
T1 Composite Category			
	Valence context sensitivity	--	6.62 2.34
	Summed context sensitivity	--	16.94 5.55
T2 Word Category			
Positive emotion words	Positive Narrative	4.60	1.83
	Negative Narrative	1.80	0.99
Negative emotion words	Positive Narrative	0.74	0.77
	Negative Narrative	2.32	1.20
Death-related words	Relationship Narrative	0.17	0.24
'We' words	Relationship Narrative	3.70	1.89
Present-tense words	Relationship Narrative	7.26	2.58
T2 Composite Category			
	Valence context sensitivity	--	6.91 2.42

Affective Word Use in Non-Loss Topics

In the first analysis, T2 grief was regressed on positive emotion word use in the Positive Narrative, positive emotion word use in the Negative Narrative, and the interaction of each measure of word use variable with the total of T1 grief symptoms. The overall model was significant $F(5,95)= 19.22, p<.001$. As predicted, there was no main effect for positive word use in the Positive Narrative, but the interaction between this variable and T1 grief was marginally significant (See Table 2). As Figure 1a shows, among individuals with high T1 grief, the use of positive emotion words in the Positive Narrative (i.e., the context-sensitive use of positive words) predicts lower grief symptoms at T2. This relationship exists while controlling for positive emotion word use in the Negative Narrative, which indicates that the relationship is specific to positive emotion word use within the context of the Positive Narrative.

Table 2. Positive emotion words across affective narratives predicting symptoms of grief at T2

Variable	<i>B</i>	<i>SE B</i>	β	R^2	ΔR^2
Step 1				0.385	-
T1 Grief	0.52***	0.05	0.62		
Step 2				0.393	0.008
T1 Grief	0.52***	0.06	0.63		
Positive emotion words/Positive Narr.	-0.13	0.11	-0.08		
Positive emotion words/Negative Narr.	-0.10	0.17	-0.04		
Step 3				0.405	0.012
T1 Grief	0.73***	0.17	0.87		
Positive emotion words/Positive Narr.	0.10	0.17	0.06		
Positive emotion words/Negative Narr.	-0.23	0.28	-0.09		
Positive words in Pos. Narr. x T1 Grief	-0.05 ⁺	0.03	-0.36		
Positive words in Neg. Narr. x T1 Grief	0.03	0.05	0.08		

The overall model was significant $F(5,95)= 19.22, p<.001$

⁺ $p <.10, *p<.05, **p<.01, ***p<.001$

A similar effect was seen in the second regression, in which T2 grief was regressed on negative emotion word use in the Negative Narrative, negative emotion word use in the Positive Narrative, and the interaction of each measure of word use with the total of T1 grief symptoms. The overall model was significant $F(5,95)= 19.39, p<.001$ and the interaction term between T1 Grief and negative emotion word use in the Negative Narrative was marginally significant (See Table 3). Similar to the findings of the first analysis, among those with high T1 grief the use of many negative emotion words (i.e., context-sensitive use of negative words) in the Negative Narrative predicted lower grief symptoms at T2 (See Figure 1b).

Table 3. Negative emotion words across affective narratives predicting symptoms of grief at T2

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1				0.385	-
T1 Grief	0.52****	0.05	0.62		
Step 2				0.388	0.003
T1 Grief	0.52***	0.06	0.63		
Negative emotion words/Positive Narr.	-0.03	0.29	-0.01		
Negative emotion words/Negative Narr.	-0.12	0.15	-0.05		
Step 3				0.407	0.009
T1 Grief	0.79***	0.13	0.95		
Negative emotion words/Positive Narr.	0.19	0.46	0.04		
Negative emotion words/Negative Narr.	0.23	0.25	0.10		
Negative words/Pos. Narr. x T1 Grief	-0.07	0.09	-0.10		
Negative words in Neg. Narr x T1 Grief	-0.09 ⁺	0.05	-0.34		

The overall model was significant $F(5,95)= 19.39, p<.001$

⁺ $p <.10, *p<.05, **p<.01, ***p<.001$

Figure 1a. The relationship between positive emotion word use in the Positive Narrative and T2 grief among those with high and low T1 grief

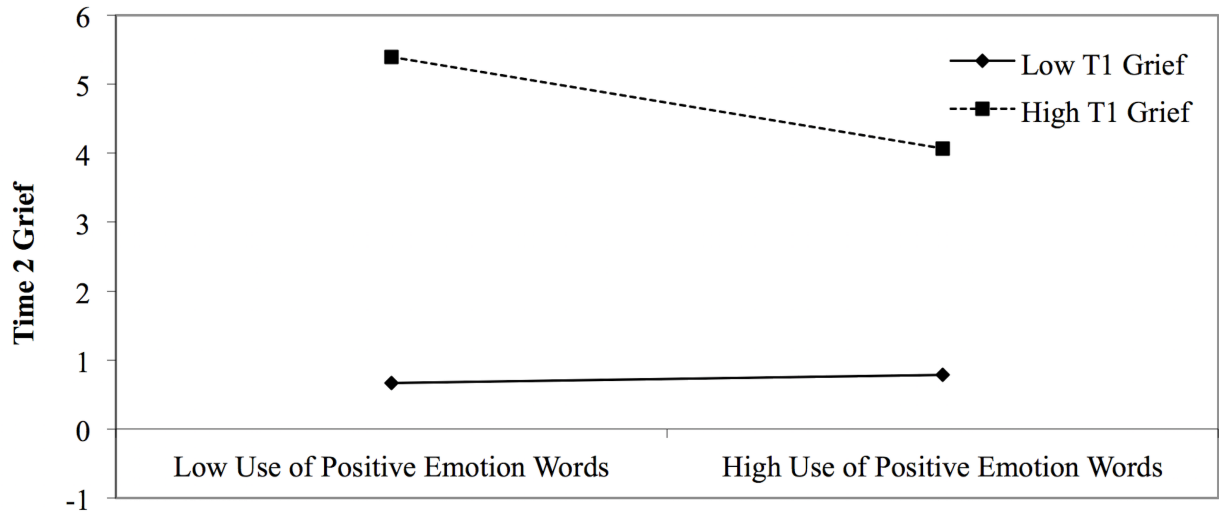
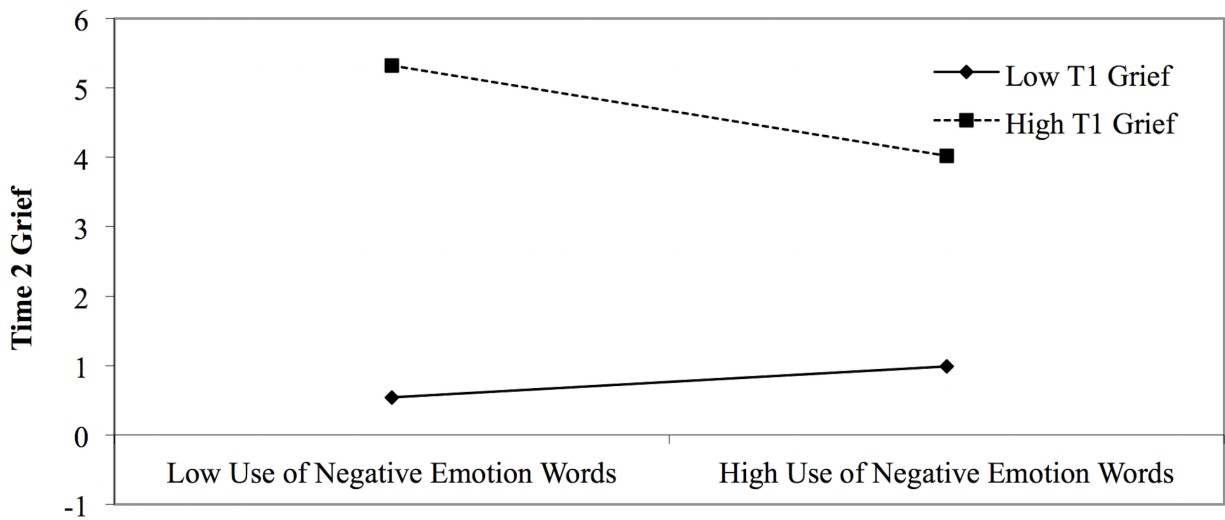


Figure 1b. The relationship between negative emotion word use in the Negative Narrative and T2 grief among those with low and high T1 grief



For the third analysis, a *valence context sensitivity* variable was constructed by adding the frequencies of context-congruent word use (positive emotion word use in the Positive Narrative and negative emotion word use in the Negative Narrative). Time 2 grief was regressed on this variable as well as the interaction of this variable and T1 grief. The overall model was significant $F(5,141)= 20.07, p<.001$ and, as expected, the interaction variable of T1 grief and *valence context sensitivity* significantly predicted T2 grief. For bereaved individuals with elevated T1 grief symptoms, high *valence context sensitivity* predicted lower T2 grief symptoms while low valence context sensitivity predicted higher T2 grief symptoms (See Table 4 and Figure 2). This relationship was significant even when controlling for incongruent word use (positive emotion words in the negative topic and negative emotion words in the positive topic).

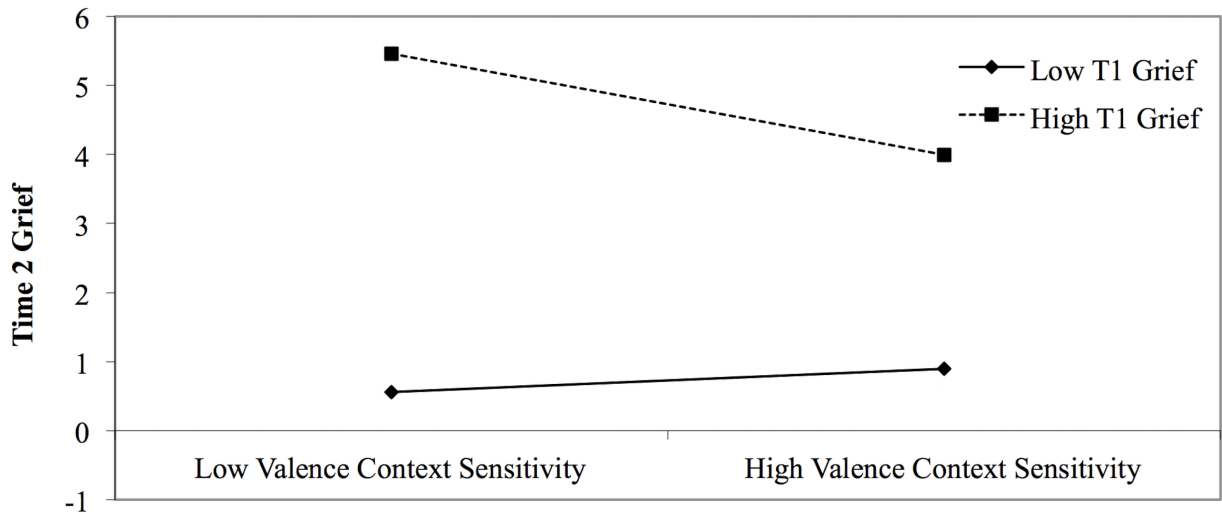
Table 4. Valence context sensitivity predicting symptoms of grief at T2

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1				0.00	-
Valence Context Sensitivity	-0.001	0.10	0.00		
Step 2				0.39	0.39
Valence Context Sensitivity	-0.10	0.08	-0.09		
T1 Grief	0.53***	0.06	0.63		
Step 3				0.41	0.02
Valence Context Sensitivity	0.12	0.13	0.11		
T1 Grief	0.90***	0.18	1.08		
Valence Context Sens. x T1 Grief	-0.05*	0.02	-0.53		
Step 4				0.42	0.01
Valence Context Sensitivity	0.12	0.13	0.10		
T1 Grief	0.91***	0.18	1.10		
Valence Context Sens. x T1 Grief	-0.05*	0.02	-0.54		
Positive Words in Negative Narrative	-0.12	0.17	-0.05		
Negative Words in Positive Narrative	-0.16	0.28	-0.04		

The overall model was significant $F(5,141)= 20.07, p<.001$

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

Figure 2. The relationship between *valence context sensitivity* and T2 grief among those with low and high T1 grief



Context Sensitivity when Discussing Conflict and Intimacy with the Deceased

In the first analysis, the use of social words in the Conflict Narrative and the Intimacy Narrative was examined. Time 2 grief was regressed on T1 grief, social word use in the Conflict Narrative, social word use in the Intimacy Narrative, and the interaction of each social word use variable with T1 grief. The full model was significant, $F(5,101)= 22.96, p<.001$. There was a main effect for social word use in the Conflict Narrative, with use of social words in this narrative predicting lower levels of T2 grief (See Table 5). The interaction term between social word use in the Conflict Narrative and T1 grief was also significant. As Figure 3 shows, among those with high T1 grief, the use of many social words in the Conflict Narrative predicted a decrease in symptoms of grief at T2.

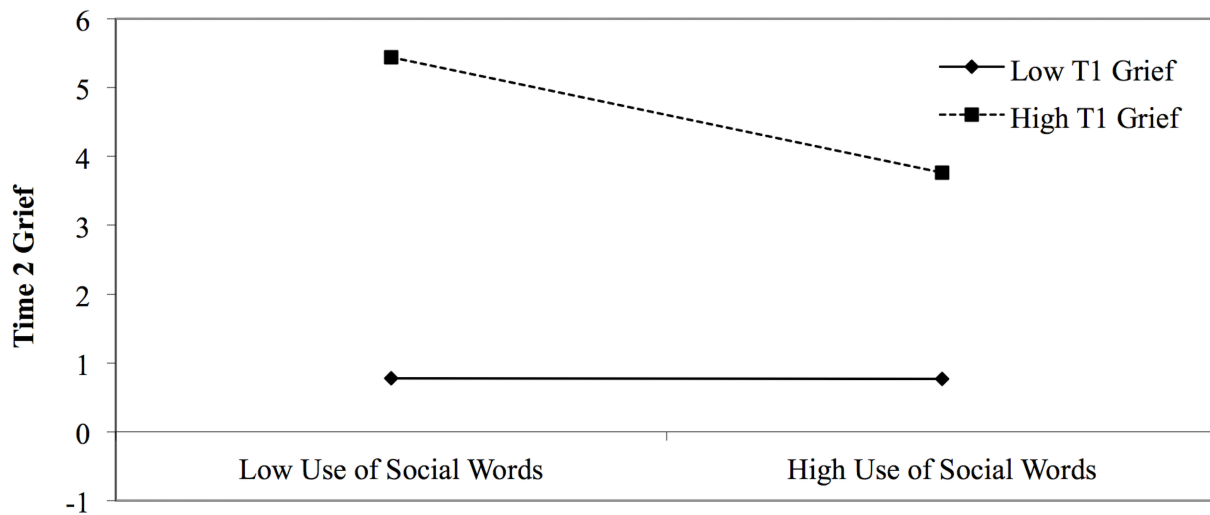
Table 5. Social word use across Conflict and Intimacy Narratives predicting symptoms of grief at T2

Variable		<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1					0.392	-
	T1 Grief	0.51***	0.05	0.63		
Step 2					0.426	0.034
	T1 Grief	0.52***	0.05	0.63		
	Social words/Conflict	-0.13**	0.05	-0.18		
	Social words/Intimacy	0.08	0.05	0.11		
Step 3					0.458	0.031
	T1 Grief	0.68**	0.22	0.84		
	Social words/Conflict	0.03	0.08	0.04		
	Social words/Intimacy	-0.01	0.08	-0.01		
	Social words/Conflict x T1 Grief	-0.04**	0.01	-0.66		
	Social words/Intimacy x T1 Grief	0.02	0.02	0.41		

The overall model was significant $F(5,101)= 22.96, p<.001$

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

Figure 3. The relationship between social word use in the Conflict Narrative and T2 grief among those with low and high T1 grief



In the second analysis, the relationship between T2 grief and anger word use in the Conflict Narrative and Intimacy Narrative was examined. Time 2 grief was regressed on anger word use across in the Conflict Narrative, anger word use in the Intimacy Narrative, and the interaction of each anger use variable with T1 grief. The full model was significant $F(5,96)=20.87, p<.001$. For individuals with elevated T1 symptoms, the use of many anger words in the Conflict Narrative predicted lower T2 grief symptoms, while the use of few anger words predicted higher T2 grief symptoms (See Table 6 and Figure 4). As expected, anger word use in the Intimacy Narrative was not a significant predictor of T2 grief.

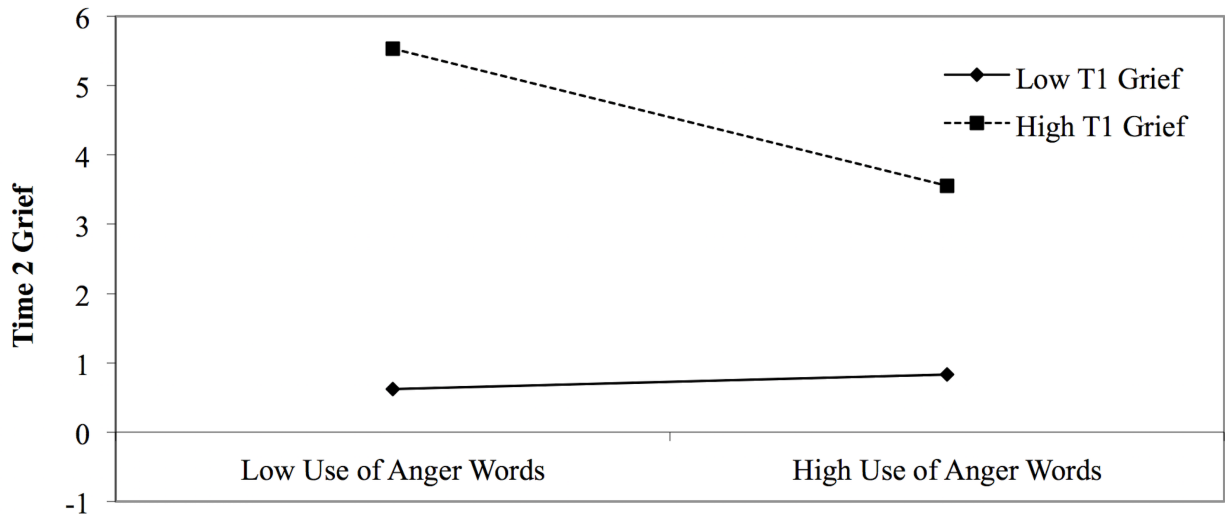
Table 6. Anger word use across Conflict and Intimacy Narratives predicting symptoms of grief at T2

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1				0.392	-
T1 Grief	0.51***	0.05	0.63		
Step 2				0.402	0.009
T1 Grief	0.51***	0.05	0.63		
Anger words/Conflict	-0.32	0.22	-0.10		
Anger words/Intimacy	-0.22	0.96	-0.02		
Step 3				0.434	0.032
T1 Grief	0.65***	0.09	0.80		
Anger words/Conflict	0.24	0.30	0.07		
Anger words/Intimacy	-1.01	1.53	-0.07		
Anger words/Conflict x T1 Grief	-0.16**	0.06	-0.31		
Anger words/Intimacy x T1 Grief	0.16	0.28	0.06		

The overall model was significant $F(5,96)= 20.87, p<.001$

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

Figure 4. The relationship between anger word use in the Conflict Narrative and T2 grief among those with low and high T1 grief



Context Sensitivity when Discussing the Relationship and the Loss

The relationships between the use of death-related words, present-tense words, and ‘we’ words and T2 grief in the Relationship and Loss Narratives were examined. In the first analysis, T2 grief was regressed on death-related words in the Relationship Narrative, the use of death-related words in the Loss Narrative, and the interaction terms of each of these variables and T1 grief. The overall model was significant $F(5,103)= 21.29, p<.001$, as was the interaction term between death-related word use in the Relationship Narrative and T1 grief (See Table 7). Among those with high T1 grief, the use of many death words in the Relationship Narrative predicted high levels of T2 grief, and the use of few death words predicted lower levels of T2 grief (See Figure 5). It is worth noting that a similar relationship was not seen for death word use in the Loss Narrative, suggesting that the effect is not driven by the general use of death-related words. Rather, the use of death words in an incongruent context is the responsible for the observed effect.

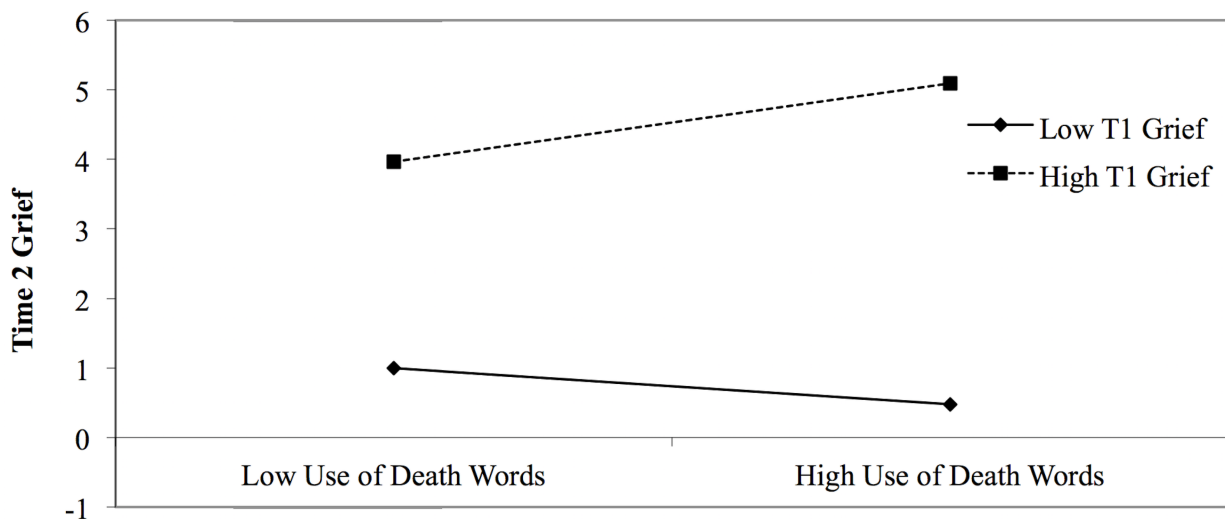
Table 7. Death-related words in the Relationship and Loss Narratives predicting symptoms of grief at T2

Variable	<i>B</i>	<i>SE B</i>	β	R^2	ΔR^2
Step 1				0.414	-
T1 Grief	0.53***	0.05	0.64		
Step 2				0.420	0.006
T1 Grief	0.53***	0.05	0.64		
Death-words/Relationship	0.97	1.01	0.07		
Death-words/Loss	0.15	0.43	0.02		
Step 3				0.445	0.025
T1 Grief	0.42***	0.08	0.50		
Death-words/Relationship	-1.72	1.59	-0.12		
Death-words/Loss	-0.24	0.75	-0.04		
Death-words/Relationship x T1 Grief	0.59*	0.28	0.26		
Death-words/Loss x T1 Grief	0.08	0.14	0.07		

The overall model was significant $F(5,103)= 21.29, p<.001$

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

Figure 5. The relationship between death-related word use in the Relationship Narrative and T2 grief among those with low and high T1 grief



A similar analysis was conducted to examine the use of present-tense words across these narrative contexts. Time 2 grief was regressed on present-tense verb use in the Relationship Narrative, present-tense verb use in the Loss Narrative, and interactions between these variables and T1 grief. The overall model was significant, $F(5,100)= 20.32, p<.001$. The interaction between present-tense word use in the Relationship Narrative and T1 grief significantly predicted T2 grief, but this effect was not observed for the Loss Narrative (See Table 8). This finding indicates that, for individuals high in T1 grief, the use of many present-tense words in the Relationship Narrative (a type of context-insensitive word use) predicted higher levels of grief at T2, while the use of few present-tense words predicted lower levels of grief (See Figure 6).

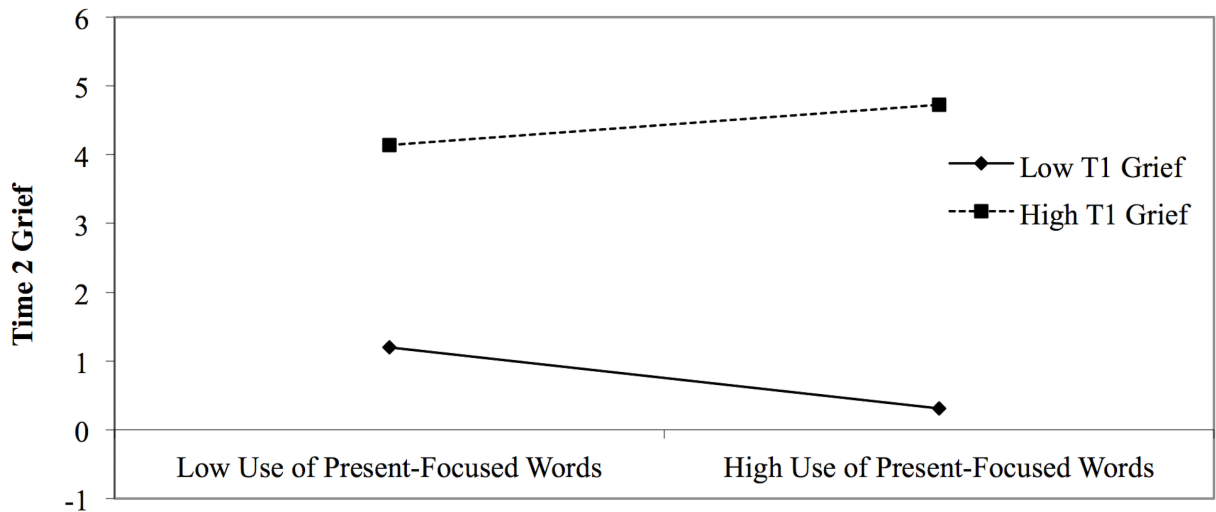
Table 8. Use of present-tense words in the Relationship and Loss Narratives predicting symptoms of grief at T2

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1				0.414	-
T1 Grief	0.53***	0.05	0.64		
Step 2				0.417	0.003
T1 Grief	0.53***	0.06	0.64		
Present-tense words/Relationship	-0.04	0.09	-0.03		
Present-tense words/Loss	0.04	0.06	0.05		
Step 3				0.433	0.016
T1 Grief	0.21	0.27	0.26		
Present-tense words/Relationship	-0.27	0.15	-0.20		
Present-tense words/Loss	0.05	0.09	0.06		
Present-words/Relationship x T1 Grief	0.05*	0.03	0.51		
Present-tense words/Loss x T1 Grief	-0.003	0.02	-0.06		

The overall model was significant $F(5,100)= 20.32, p<.001$

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

Figure 6. The relationship between present-tense word use in the Relationship Narrative and T2 grief among those with low and high T1 grief



The relationship between ‘we’ word use and T2 grief in the context of the Relationship and Loss Narratives was also examined. Time 2 grief was regressed on the use of ‘we’ words in the Relationship Narrative, the use of ‘we’ words in the Loss Narrative, and the interaction of each of these variables with T1 grief. The overall model was significant, $F(5,107)= 22.90$, $p<.001$, and the interaction term of ‘we’ word use in the Relationship Narrative and T1 grief significantly predicted T2 grief (See Table 9). For individuals high in T1 grief, the use of few ‘we’ words when discussing the relationship with the deceased predicted high levels of grief one year post-loss, while the use of few ‘we’ words predicted lower levels of T2 grief (See Figure 7). This effect was not observed in the Loss Narrative.

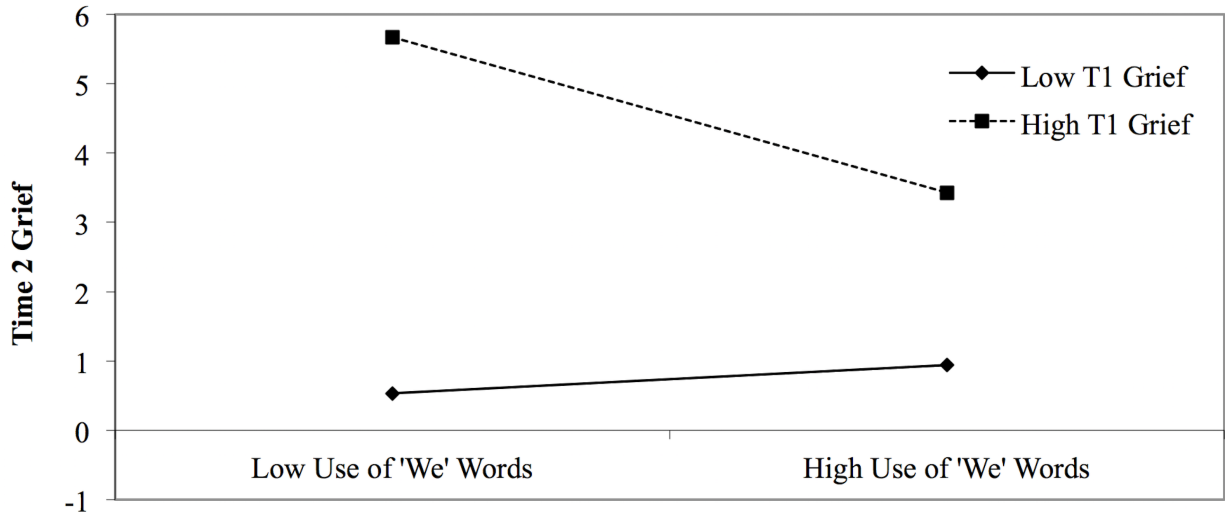
Table 9. Use of 'we' words in the Relationship and Loss Narratives predicting symptoms of grief at T2

	Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1					0.414	-
	T1 Grief	0.53***	0.05	0.64		
Step 2					0.421	0.007
	T1 Grief	0.52***	0.06	0.63		
	'We' words/Relationship	-0.12	0.10	-0.08		
	'We' words/Loss	-0.10	0.27	-0.02		
Step 3					0.463	0.042
	T1 Grief	0.91***	0.14	1.10		
	'We' words/Relationship	0.20	0.14	0.13		
	'We' words/Loss	-0.12	0.37	-0.03		
	'We' words/Relationship x T1 Grief	-0.10**	0.03	-0.54		
	'We' words/Loss x T1 Grief	0.00	0.08	0.001		

The overall model was significant $F(5,107)= 22.90, p<.001$

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

Figure 7. The relationship between 'we' word use in the Relationship Narrative and T2 grief among those with low and high T1 grief



Summed Linguistic Context Sensitivity and Grief, Depression, and PTSD

A *summed context sensitivity* variable was created by summing the word use frequencies for all word categories that were hypothesized and found to significantly predict reduced grief at T2 (i.e., positive emotion word use in the Positive Narrative, negative emotion word use in the Negative Narrative, anger word use in the Conflict Narrative, social word use in the Conflict Narrative and ‘we’ word use in the Relationship Narrative) and subtracting from that total the sum of word use frequencies for all word categories that were hypothesized and found to significantly predict increased grief at T2 (i.e., death-related words in the Relationship Narrative and present-tense words in the Relationship Narrative). When T2 grief was regressed on *summed context sensitivity*, the overall model was significant, $F(5,103)= 24.91, p<.001$. There was a main effect for *summed context sensitivity* such that high levels of context sensitivity predicted low levels of T2 grief in the sample overall (See Table 10). The interaction term between *summed context sensitivity* and T1 grief was highly significant, indicating that this effect is especially true for those individuals high in T1 grief (See Figure 8). As predicted, *summed context sensitivity* was not a significant predictor of T2 depression or T2 PTSD (See Tables 11 and 12). These findings indicate that *summed context sensitivity* in the conditions of this study is uniquely predictive of prolonged grief rather than general psychopathology.

Table 10. Linguistic Context Sensitivity predicting symptoms of grief at T2

	Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2
Step 1					0.040	-
	Summed context sensitivity	-0.10*	0.04	-0.20		
Step 2					0.433	0.393
	Summed context sensitivity	-0.08*	0.03	-0.17		
	T1 Grief	0.51***	0.05	0.63		
Step 3					0.486	0.053
	Summed context sensitivity	0.08	0.05	0.16		
	T1 Grief	1.05***	0.15	1.28		
	Summed context sensitivity x T1 Grief	-0.03***	0.01	-0.76		

The overall model was significant $F(3,172)= 41.78, p<.001$

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

Figure 8. Summed context sensitivity predicts reduced T2 grief among those with high T1 grief

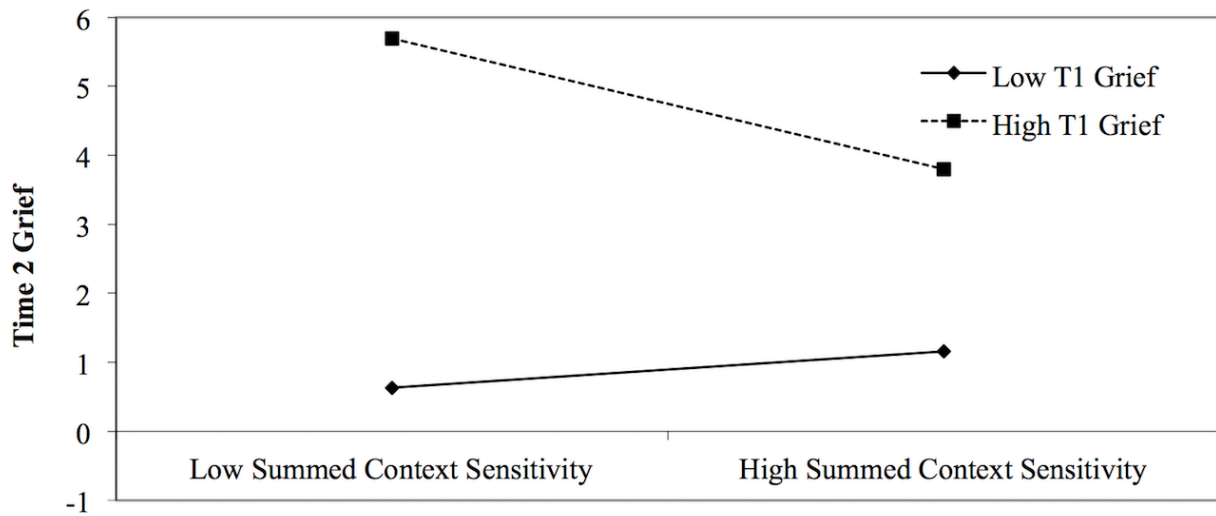


Table 11. Summed context sensitivity predicting symptoms of depression at T2

Variable	<i>B</i>	<i>SE B</i>	β	R^2	ΔR^2
Step 1				0.011	-
Summed context sensitivity	-0.04	0.03	-0.10		
Step 2				0.269	0.258
Summed context sensitivity	-0.01	0.03	-0.04		
T1 Depression	0.44***	0.07	0.51		
Step 3				0.275	0.006
Summed context sensitivity	0.02	0.04	0.06		
T1 Depression	0.63**	0.19	0.73		
Summed context sens. x T1 Depression	-0.01	0.01	-0.24		

The overall model was significant $F(3,44)= 16.30, p<.001$

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

Table 12. Summed context sensitivity predicting symptoms of PTSD at T2

Variable	<i>B</i>	<i>SE B</i>	β	R^2	ΔR^2
Step 1				0.015	-
Summed context sensitivity	-0.05	0.03	-0.12		
Step 2				0.544	0.528
Summed context sensitivity	-0.04	0.02	-0.12		
T1 PTSD	0.75***	0.06	0.73		
Step 3				0.545	0.001
Summed context sensitivity	-0.03	0.03	-0.09		
T1 PTSD	0.85***	0.16	0.82		
Summed context sensitivity x T1 PTSD	-0.01	0.01	-0.10		

The overall model was significant $F(3,103)= 52.29, p<.001$

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

Expressive Flexibility and Linguistic Context Sensitivity

There was a significant, positive correlation between *valence context sensitivity* and expressive flexibility ($r = 0.17, p < .05$) in the neutral condition, in which participants were not primed with their late spouses' names. There was no significant relationship between these variables in the condition in which they were primed. There was no significant correlation between the *linguistic context sensitivity* variable and expressive flexibility in either condition.

Summed Context Sensitivity and Subjective Likeability

There were significant, positive correlations between *valence context sensitivity* and subjective ratings of likeability on the parts of the interviewers and transcription reviewers, and the average of all three ratings of likeability. There were significant, positive correlations between *summed context sensitivity* and transcription reviewer ratings of likeability and the average rating of likeability (See Table 13).

Table 13. Correlations between Summed Context Sensitivity and Ratings of Likeability

	Summed Context Sensitivity	Valence Context Sensitivity
	<i>r</i>	<i>r</i>
Interviewer	0.02	0.20**
Transcriber	0.09	0.12
Reviewer	0.30**	0.23*
Average Likeability	0.25*	0.29*

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

Early Grief as a Predictor of Later Context Sensitivity

In this cross-lag analysis, T2 *valence context sensitivity* was regressed on T1 *valence context sensitivity*, T1 grief, and an interaction term of those two variables. The overall model was significant, $F(3,21) = 3.49, p < .05$. Results indicated that T1 *valence context sensitivity* was a significant predictor of T2 *valence context sensitivity*, suggesting that this trait is stable over time. Time 1 grief was not a significant predictor, however, of T2 *valence context sensitivity*, thereby suggesting that the predictive relationship between grief and *valence context sensitivity* is unidirectional (See Table 14).

Table 14. T1 grief symptoms predicting T2 valence context sensitivity

Variable	<i>B</i>	<i>SE B</i>	β	R^2	ΔR^2
Step 1				0.085	-
Time 1 Valence Context Sensitivity	0.32**	0.10	0.29		
Step 2				0.086	0.001
Time 1 Valence Context Sensitivity	0.36*	0.17	0.33		
Time 1 Grief	0.09	0.24	0.12		
T1 Valence Context Sens. x T1 Grief	-0.01	0.03	-0.11		

The overall model was significant $F(3,21)= 3.49, p<.05$

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

Discussion

The present study sought to determine whether, among bereaved individuals with high levels of grief immediately following a loss, context-sensitive word use would predict a favorable course of adjustment over the first year post-loss. Overall, the findings supported our hypotheses; across a range of narrative conditions, the context-sensitive use of several word categories predicted a decrease in grief symptoms between T1 and T2. Furthermore, the context-*insensitive* use of several word categories predicted an increase in grief symptoms between T1 and T2. More specifically, the use of positive emotion words in the Positive Narrative, negative emotion words in the Negative Narrative, 'we' words in the Relationship Narrative, and anger and social words in the Conflict with Spouse Narrative predicted a decrease in symptoms of grief between T1 and T2. The use of present-tense words and death-related words in the Relationship Narrative predicted an increase in grief between the two time points. The use of positive and negative emotion words across non-loss topics was summed in order to create a *valence context sensitivity* variable, and high *valence context sensitivity* at T1 predicted a decrease in grief symptomology at T2. Furthermore, a *summed context sensitivity* variable was generated, and this variable also predicted decreased grief at T2. As anticipated, *summed context sensitivity* did not significantly predict levels of PTSD or depression at T2, indicating that the effects observed in the present study appear to be specific to symptoms of persistent complex bereavement disorder.

These findings are consistent with those of previous studies that have found relationships between low context sensitivity and symptoms of prolonged distress in bereavement (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014). Context sensitivity hinges on the ability to accurately perceive the opportunities and demands of a situation, and is essential to adaptive responding (Bonanno & Burton, 2013). In the case of the present study, the idiographic interview

questions constituted these demands. The text analyses measured whether or not participants accurately gauged the situational demands, with language as a proxy to context sensitivity. Consistent with previous studies, the results indicated that the ability to accurately read contextual cues related to greater psychological wellbeing (Cheng, et al, 2012; Troy, Shallcross & Mauss, 2013), while the inability to read these cues predicted greater symptomatology (Kring, 2008). To the best of our knowledge, this was the first longitudinal study to use text analysis to examine context sensitivity among the bereaved. The analysis of language offered a direct and concrete way to assess context sensitivity. By quantifying and categorizing word usage, we were able to analyze the specific ways in which participants interpreted the demands of the interview task. In several instances, the text analysis methodology also provided perspective on thought content. For the purposes of this study, text analysis served as a useful and multifaceted tool in the examination of context sensitivity.

Affective Word Use in a Non-loss Topic

The tendency to use of positive emotion words in the Positive Narrative and negative emotion words in the Negative Narrative predicted a decrease in grief symptomology at T2 among those high in T1 symptomology. Furthermore, a *valence context sensitivity* variable (constructed by adding the use of positive emotion words in the Positive Narrative to negative emotion words in the Negative Narrative) predicted a decrease in grief symptoms at T2. This finding held even when controlling for general use of positive emotion words and negative emotion words, thereby indicating that the effect was driven by context-specific word use. These findings are consistent with previous research that has found that dampened affective responding corresponds to high levels of psychopathology. This effect has been demonstrated for dampened positive emotion (Gruber, Oveis, Keltner & Johnson, 2011) and negative emotion (Rottenberg,

Gross, Wilhelm & Gotlib, 2003), as well as in studies that examined dampened positive and negative emotion concurrently (Bylsma, et al., 2007; Kaviani, et al., 2004; Tsai, Pole, Levenson & Munoz, 2003). Our findings are also consistent with previous research demonstrating that restricted affective responding to emotionally provocative stimuli predicts poor outcomes over time (Morris, Bylsma & Rottenberg, 2009; Rottenberg, et al., 2002). Beyond dampened emotional responding, our findings are also consistent with research that suggests that the failure to match response type to context is linked with negative consequences (Arsenio, et al., 2000; Bonanno, et al., 2007). Furthermore, the present study expands upon previous findings that, among bereaved individuals, context sensitivity for affective stimuli in particular corresponds to greater wellbeing (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014).

The capacity to respond to emotionally evocative stimuli and experience both negative and positive emotions is adaptive (Rottenberg, Kasch, Gross & Gotlib, 2002). Emotions serve distinct functions, including motivating goal-directed behavior and facilitating interpersonal relatedness (Keltner & Gross, 1999). In the case of bereavement, the inability to respond to emotional stimuli by using affective language may relate to an internal blunting of emotional experience. Perhaps this blunting serves to buffer against extreme emotion in attempts to maintain psychological equilibrium. The experience of emotional numbness is a core criterion of persistent complex bereavement disorder (Shear, 2015). As previous research has demonstrated, however, there are ultimately great costs to affective blunting as it has been linked to the development and maintenance of psychopathology (Morris, et al., 2009).

An additional explanation for the observed effect may be a fundamental inconsistency between the demands of a task and the ways in which especially context-*insensitive* individuals responded to those demands. Rather than a blunting of internal affective experience, perhaps

these individuals simply did not accurately perceive the task demands, and thus were unable to respond in ways that one would expect given the task objectives. This inability to accurately gauge context and respond appropriately has previously been linked to symptoms of psychopathology (Kring, 2008).

Context Sensitivity when Discussing Conflict and Intimacy with the Deceased

The use of social words and anger words in the Conflict Narrative predicted decreased levels of T2 grief among those high in T1 grief. This effect was not observed, however, for use of these word categories in the Intimacy Narrative. These results indicate that there is a particular benefit to using context-sensitive words when describing instances of conflict with a deceased partner.

When listening to the recounting of a conflict experience, one would expect to hear the use of many anger words as the speaker recalls how they felt in the moment, and perhaps experiences some of those same emotions in the recounting. The expression of anger in context-appropriate situations can be both adaptive and beneficial (Helmer, Baker, O'Kelly & Tobe, 2000; Kross, Ayduk & Mishcel, 2005). Whereas suppression of anger has been linked to a number of detrimental psychological and physical outcomes (Burns, et al., 2011; Cheung & Park, 2010), the ability to express context-appropriate anger suggests an awareness of one's emotions, which is key to expressing anger constructively (Wright, Day & Howells, 2009). The ability to express anger constructively is especially relevant in romantic relationships (Schneewind & Gerhard, 2002). Research has suggested that when an individual can experience conflict in an intimate partnership, it indicates that they can balance the positive and negative aspects of a partner without overly idealizing them (Young & Acitelli, 1998). In the current study, the lack of anger-related words while describing an instance of conflict predicted a poor outcome. It is possible

that those individuals who do not express anger while describing conflict are suppressing their anger, and habitual suppression of anger is common among those with high levels of psychopathology (Cheung & Park, 2010). Alternatively, perhaps they idealized their late spouses to a degree that inhibited their ability to recount conflictual interactions.

The use of social words in the Conflict Narrative also predicted a decrease in symptoms of grief at T2. One would expect to hear many social words in this type of narrative because, as an interpersonal exchange, conflict is inherently social. If an individual does not use social words in this narrative context, they are not carrying out the task demands. For example, they may have avoided describing a conflict experience and have spoken about a different subject instead. Previous research has suggested that the use of many social words relates to wellbeing, as it provides a sense of purpose, belongingness, and collective identity (Haslam, Jetten, Postmes & Haslam, 2009; Pressman & Cohen, 2007). Even when describing conflict, the use of social words indicates that an individual identifies with their social connections and ties (Kawachi & Berkman, 2001).

The finding that social word use in the Intimacy Narrative did not predict changes in grief symptomology was less expected, as social word use in this narrative is also context-sensitive. However, previous research has indicated that bereaved individuals often struggle to gain comfort from describing moments of intimacy with their late spouses (Diminich & Bonanno, 2014). Given this fact, it is possible that avoidance of social-word use in this context served as a buffer to the pain of recalling memories of closeness. In this respect, avoidance of social-word use may have been adaptive. Alternatively, it is possible that highly symptomatic individuals have difficulty recalling instances of intimacy with their late spouses. As a result, they do not use many social words when asked to describe a moment of closeness.

Context Sensitivity when Discussing the Relationship and Loss

In the Relationship Narrative, use of ‘we’ words predicted decreased grief at T2 among those high in grief at T1. Conversely, the use of present-tense words and death-related words predicted an increase in T2 grief among those high in T1 grief. The use of these words in the Loss Narrative was also examined, however, none of the words categories in this context were predictive of T2 grief. This may be because the Loss Narrative directive was quite open ended (“please speak about the loss and your life since the loss”) and responses were so heterogeneous that no specific word categories would necessarily be context-appropriate. Nonetheless, including these variables from the Loss Narrative in the analyses allowed us to control for overall use of ‘we’ words, death-related words and present-tense words, and to ascertain that the effects we observed were confined specifically to the Relationship Narrative condition.

The use of ‘we’ words is fundamental to the demands of the Relationship Narrative task. A lack of ‘we’ words in this narrative represents an insensitivity to the context, and perhaps an avoidance of the task objectives. Individuals with prolonged grief may be particularly motivated to avoid speaking about the relationship, as avoidance of reminders of the deceased and the loss is a hallmark symptom of PCBD (Shear, 2015). Previous research has found that reminders of the lost relationship can be overwhelmingly painful for these individuals (Diminch & Bonanno, 2014), and there may be particular motivation for them to avoid this pain. Researchers have hypothesized that avoidance results in a failure to process difficult information and that, as a result, acute grief is prolonged (Shear, 2010; Shear & Shair, 2005). It is also possible that it’s fundamentally difficult for individuals with prolonged grief to conceptualize themselves as part of the former dyad, and that this difficulty is expressed in the way they reflect on the relationship.

Conversely, if a bereaved individual uses many ‘we’ words, it indicates that he or she is able to reflect on the relationship and conceptualize him or herself as part of a dyad. Consistent with the use of social words in the Conflict Narrative, this means that individual is capable of viewing him or herself as part of a unit, and may find constructive meaning and identity in the relationship (Haslam, et al., 2009; Pressman & Cohen, 2007).

The greater use of present-tense verbs in the Relationship Narrative predicted an increase in grief symptoms between T1 and T2. Since the relationship had a definitive end-point and has ceased to exist, the use of present-tense verbs to describe it is not expected. Previous research has linked this type of temporal confusion to poor psychological outcomes (Holman & Silver, 1998). The use of present-tense verbs to describe past events is especially characteristic of trauma narratives, and prevalent among those with PTSD (Hellowell & Brewin, 2004; Jelinek, et al., 2010). We found no relationship between our measures of linguistic context sensitivity and symptoms of PTSD, as will be discussed in a following section. Nonetheless, for those individuals in the present study who used many present-tense words to describe their relationships, recalling the relationship may have the same type of psychological effects that trauma survivors experience while recalling traumatic incidents. It may also indicate that these individuals are struggling to accept the death and so they speak as if the relationship were still in existence. Difficulty accepting the death is a core criterion of PCBD (Shear, 2015). This finding is consistent with previous studies that found that, in the aftermath of a stressful event, the use of many present-tense words in describing the event is predictive of poor outcomes over time (Pennebaker, Mayne & Frances, 1997).

The use of death-related words in the Relationship Narrative also predicted an increase in grief symptoms between T1 and T2. While the use of death-related words may be expected in the

Loss Narrative, it would not necessarily be expected when describing the relationship that predated the loss. The frequent use of these words suggests a preoccupation with death, which has been linked to poor psychological wellbeing (Abdel-Khalek, 1998; Vollmer, Wittmann, Schweiger & Hiddemann, 2011). It is also significant, however, that these individuals have used many death-related words in the context of the Relationship Narrative. It is possible that a preoccupation with death has eclipsed the memory of the relationship itself, as two core criteria of PCBD are a preoccupation with the circumstances of the death, and an inability to have positive memories of the deceased (Bui, et al., 2015). This finding potentially relates to the present-tense verb finding; it's possible that these individuals aren't capable of reflecting on the relationship and, instead, are preoccupied with the death and their present circumstances of bereavement. This finding is consistent with previous studies that found that individuals who used many death-related words when writing about trauma reported greater psychological distress at later follow-up (Pennebaker, et al., 1997).

Alternatively, it's possible that the individuals who used many death-related words in the Relationship Narrative are unable to gain comfort from memories of their late spouses. Previous research has suggested that the ability to reflect positively about a deceased spouse (i.e., to gain comfort and to feel happy / at peace when discussing him or her) is linked to low levels of psychopathology following a loss (Bonanno, Wortman & Nesse, 2004). It is possible that the use of many death-related words among those with high levels of prolonged grief symptoms represents the inability to gain comfort from reflecting on the deceased.

Summed Context Sensitivity and Grief, Depression, and PTSD

A *summed context sensitivity* variable was created by adding the context-sensitive word use frequencies and subtracting from this total the sum of context-*insensitive* word use

frequencies. Results showed that this *summed context sensitivity* variable predicted decreased T2 grief in the sample overall, not only among those with high T1 grief. There was no relationship, however, between *summed context sensitivity* and symptoms of depression or PTSD at T2. This finding suggests that the *summed context sensitivity* variable we constructed is uniquely predictive of prolonged grief. Given this fact, our findings contribute to a growing body of literature that suggests that PCBD is phenomenologically different from depression and PTSD (Bonnano, et al., 2007; Denckla, et al., 2011; Lotterman, et al., 2014; Shear, 2015; Zisook & Shear, 2009). With the exceptions of the Positive Narrative and the Negative Narrative, the narrative conditions in this study aimed to access experiences that are specific to bereavement. The word categories we chose to analyze intended to tap sensitivity to these particular bereavement-related contexts. The fact that the *summed context sensitivity* variable uniquely predicted symptoms of prolonged grief suggests that the study conditions adequately captured cognitive processes related to prolonged grief. Our findings in several of the individual word categories and narratives align with many of the core criteria of PCBD, including avoidance of reminders of the deceased / the loss, difficulty having positive memories about the deceased, preoccupation with the death, and feeling emotionally numb (Bui, et al., 2015; Shear, 2015).

In order to determine whether early grief might impact later context sensitivity, we conducted a cross-lag analysis to further examine the relationship between context sensitivity and grief, and to determine whether early grief might impact later capacity for context sensitivity. Our results showed that early symptoms of grief did not predict later context sensitivity, and thus demonstrated that the relationship between context sensitivity is unidirectional. This analysis did suggest, however, that context sensitivity at T1 significantly

relates to context sensitivity at T2 which may indicate that, as a trait, it is relatively stable over time.

Expressive Flexibility and Linguistic Context Sensitivity

There was a significant, positive correlation between *valence context sensitivity* (i.e., use of positive emotion words in the Positive Narrative and negative emotion words in the Negative Narrative) and expressive flexibility in the neutral condition, in which participants were not primed with their spouses' names. There was no relationship between the overall *summed context sensitivity* variable and expressive flexibility in either condition. Both the expressive flexibility task and the Positive and Negative Narratives involved positive and negative affective themes. Thus, the relationship between *valence context sensitivity* and expressive flexibility may have hinged on an individual's capacity to process and respond to affective stimuli. In the spouse condition, in which participants were primed with their late spouse's name during the expressive flexibility trials, it is possible that the prime challenged participants by imposing a cognitive load that affected their performance on the task. Perhaps the lack of a significant relationship between *valence context sensitivity* and expressive flexibility in the spouse condition is due to the challenge presented by this prime.

The constructs of expressive flexibility and context sensitivity both hinge on emotion regulation capacity (Bonanno & Burton, 2013). While expressive flexibility specifically describes the modulation of outward displays of emotion, context sensitivity more broadly describes the ability to read contextual cues in order to tailor emotional responses to a given situation (Bonanno, et al., 2004; Coifman & Bonanno, 2009). Both expressive flexibility and context sensitivity are markers of adaptive emotion regulation capacity (Bonanno & Burton 2013). As such, it stands to reason that an individual who is flexible would also be context-

sensitive. Like context sensitivity, expressive flexibility is a marker of adaptive functioning and a correlate of symptomatology (Rodin, 2017). Expressive flexibility also relates to adjustment following adverse life events, and flexibility in the wake of stressful life events has predicted positive long-term outcomes (Westphal, et al., 2010). Furthermore, research has shown that performance on the expressive flexibility task may differentiate individuals with and without prolonged grief (Gupta & Bonanno, 2010). This was the first study to empirically explore the relationship between expressive flexibility and context sensitivity.

Context Sensitivity and Subjective Likeability

Ratings of participant likeability were provided by the interviewers, transcribers, and the individuals who reviewed the transcriptions for accuracy. The relationships between these ratings (as well as an average rating of likeability) and *valence context sensitivity* and *summed context sensitivity* were examined. There were significant, positive correlations between *valence context sensitivity* and ratings of likeability on the parts of the interviewer, transcription reviewer, and the average rating of likeability. There were also significant, positive correlations between *summed context sensitivity* and the transcription reviewer ratings of likeability and average rating of likeability. Transcriber ratings of likeability did not correlate with either measure of context sensitivity.

The findings suggest that, in general, listeners liked when speakers expressed the type of emotion one would expect given the circumstances of a task. That is, they liked participants who were able to use many positive emotion words when asked to describe a positive event, and negative emotion words when asked to describe a negative event. This finding is consistent with previous research that has found that listeners expect speakers to express emotion in certain contexts; for example, crime victims who express much emotion in their impact statements are

perceived as more deserving of sympathy (Nadler & Rose, 2002), and the crimes against them are perceived as more egregious (Rose, Nadler & Clark, 2006). Furthermore, our results also suggest that listeners find speakers who generally use context-sensitive words more likeable than those who don't use those word types. It is possible that the use of context-sensitive language is key to the construction of a shared experience. A listener may feel put-off by or a disconnected from a speaker who is not attuned to the context that they are sharing. Previous research has indicated that individuals look at congruence of behavior and expression of emotion when deciding whether or not they trust someone (Campellone & Kring, 2013). It's possible that, in our study, listeners perceived context-*insensitive* individuals as disingenuous or untrustworthy.

The relationships between context sensitivity and ratings of likeability were not identical among the different types of raters. For the interviewers, there was only a correlation between ratings of likeability and *valence context sensitivity*. The interviewers heard the narratives once and in real-time, without reviewing videotapes or working with transcriptions. Perhaps they were most impacted by participants' affective displays during the session, and their perceptions of likeability were driven by this factor. For the transcribers, there was no significant relationship between their ratings of likeability and either measure of context sensitivity. The experience of transcribing, which can be slow and laborious, differs greatly from the experience of listening to a narrative in real-time. As a result, it is possible that the transcribers did not pick up on context sensitivity in the same way that the other two types of raters did. For the transcription reviewers, who read the transcriptions while watching videos of the narratives, ratings of likeability correlated with both measures of context sensitivity. Since these individuals had the experience of listening to the narratives in real-time while also reading the text transcription of the interview, it is possible that they were particularly attuned to context sensitivity since they both

read and listened to the narratives. Perhaps the experience of reading enhances awareness of word use choices and linguistic context sensitivity.

Limitations

There are a number of limitations to the current study. First, the use of idiographic interview questions allowed for open-ended and heterogeneous responses. In this respect, there is a lack of experimental control that may have been present had we used a more structured format and/or a forced-choice response method. Though it was not commonly the case, it is possible that some individuals evaded the interview questions and spoke about unrelated topics. We posit, however, that these seemingly off-topic responses still provide useful information because the failure to accurately respond to questions represents a type of context-*insensitivity*. Furthermore, the use of idiographic narratives provided a much higher level of ecological validity than we could have achieved using structured interviews or self-report measures.

Second, the LIWC dictionary also imposed certain limitations. Though the dictionary includes around 6,400 words that comprise 90 word categories, there remain some less-common words that were not included. It is possible that our participants used some context-sensitive and -insensitive words that were not detected by the LIWC software. Furthermore, there are some word categories that would have been ideal for our analyses, but do not exist in the LIWC software. For example, it would have been relevant to have access to an “intimacy words” category to examine within the Intimacy Narrative, but no such category exists. In addition, the LIWC software is comprehensive, but it cannot interpret all categories of word use. For example, it is not sensitive to instances in which a speaker is quoting someone or paraphrasing. For this reason, it is possible that there were some instances in which the software may have over-tallied word counts.

Third, in the cross-lag analysis that examined the relationship between grief symptoms at T1 and context sensitivity at T2, we were not able to construct the same *summed context sensitivity* variable for T2 that we constructed for T1. During the T2 idiographic interviews, the Conflict Narrative and Intimacy Narrative questions were not asked, so we did not have this data to help us construct the variable. Instead, we constructed a *valence context sensitivity* variable, and found that T1 grief did not predict T2 *valence context sensitivity*. It is possible, however, that had we been able to construct a T2 *summed context sensitivity* variable, that T1 grief may have predicted T2 *summed context sensitivity*.

Fourth, the Loss Narrative data is rich and full of intriguing themes. However, the interview question (“please talk about the loss and your life since the loss”) is especially open-ended and resulted in extremely varied responses. Due to the heterogeneity of responses, it was not possible to hypothesize which word categories would represent context-sensitive word use, and so it was impossible to study this narrative in a systematic way. For example, some individuals expressed negative emotion such as sadness and yearning while others, such as those whose partners suffered long and protracted illnesses, often expressed a sense of relief and peace.

Clinical Implications

The findings of the present study hold several relevant clinical implications. We observed that individuals who use context-*insensitive* language in the wake of a loss had a poorer outcome and more symptoms of prolonged grief in the first year of adjustment. It is possible that context-*insensitivity* serves a distinct function in the context of bereavement. Perhaps context-*insensitive* individuals are attempting protect themselves from negative emotion states by avoiding subjects that may be emotionally activating. A core criterion of PCBD is a sense of emotional numbness (Bui, et al., 2015), which may be the result of this extreme avoidance. Recent research suggests

that, in the context of psychopathology, prolonged negative emotional states may provide a sense of constancy and protection against jarring “contrast experiences,” or sudden, unexpected shifts in affect (Newman & Llera, 2011). In the context of PCBD, perhaps avoidance and the blunting of emotional experiences serves as a buffer against the waves of pain and grief that are characteristic of bereavement. Previous research has suggested, however, that attempts at suppression and avoidance often backfire and result in reinforcement of the negative affect that one was trying to evade in the first place (Shear, 2010). Perhaps this is the mechanism linking context-insensitive behavior to the development and maintenance of prolonged grief symptoms.

Alternatively, individuals suffering from prolonged grief may struggle with tasks such as the ones presented in this study because they are so enveloped in their internal experience that they have difficulty connecting with the external world. The core criteria of PCBD include negative affective states along with withdrawal from social interaction and pursuit of regular activities (American Psychiatric Association, 2013). It is possible that the lack of linguistic context sensitivity observed among highly symptomatic individuals relates to their preoccupation with their internal experience. Perhaps this preoccupation results in difficulty disengaging from the internal state in order to process and carry out task demands.

Our findings are clinically relevant because we measured linguistic context sensitivity at three-months post-loss, during a period so early in bereavement that the diagnosis of persistent complex bereavement disorder was not yet possible. In terms of intervention, linguistic context sensitivity may be used to enhance early diagnostic capabilities and provide a sense of prognosis. If a psychotherapy patient displays context-*insensitive* uses of language, such as failing to verbally express negative emotion when describing their grief, or speaking in the present tense to describe a deceased spouse, this may indicate to a clinician that the patient is at risk of

developing PCBD. The intervention may then focus on the enhancement of context-sensitive language for narrative memories. In a manner akin to exposure therapy, therapists may help these individuals to work through avoidance to focus specifically on their memories of the deceased, their experience of loss, and their views of their lives at present. Patients' patterns of context-*insensitive* word use could be brought to their attention, and they could be helped to understand how and why they may be using such language. This process may enhance their ability to attend to their emotional experience without avoiding it, and could enhance their ability to effectively regulate their emotions. In turn, this may curb the development of persistent complex bereavement disorder and may steer individuals toward a favorable course of adjustment in the first year of bereavement.

The current investigation was the first longitudinal study to examine context sensitivity as it relates to prolonged grief symptoms. Overall, our results indicated that context-sensitive word use predicts a favorable course of adjustment in the first year of bereavement. The findings demonstrated the potential of linguistic context sensitivity in the prediction of development and maintenance of persistent complex bereavement disorder. Future studies will seek to replicate and expand upon these findings, as this initial inquiry has promising diagnostic and clinical implications.

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Appendix: Structured Clinical Interview for Grief Symptoms

- 1) During the past month, have you experienced distressingly strong yearnings, wishing that *[your spouse]* were there?
- 2) In the past month, did you think a lot about why or how *[your spouse]* died?
- 3) In the past month, have you had regrets about your behavior toward *[your spouse]*? Have you blamed yourself or felt angry with yourself for not acting differently when *[your spouse]* was alive? Have you had regrets for not having done something or said something prior to his/her death?
- 4) In the past month, have you had regrets or anger toward other people such as doctors, friends, or relatives, for their behavior toward *[your spouse]*?
- 5) Do you find it difficult to accept the physical reality of *[your spouse's]* death?
- 6) In the past month, have you felt alone or empty?
- 7) Have you felt during the past month that you could develop new close personal relationships at this time?
- 8) Have you felt during the past month that your life is empty, or that there is no meaning without *[your spouse]*? Did you worry a lot about not being able to manage without him/her?
- 9) In the past month did you think about *[your spouse]* or about his/her death when you did not want to?
- 10) In the past month, did you feel a lot worse when you were in situations that reminded you of *[your spouse]* or of his/her death?
- 11) During the past month, did you have a physical response to situations that reminded you of *[your spouse]* or of his/her death?
- 12) In the past month, did you make a special effort to avoid thinking or talking about the event(s)? Did you try to avoid feelings associated with the event(s)? Did you try to avoid doing things, or avoid people or places that reminded you of the event(s)?
- 13) In the past month, did you feel distant or cut-off from other people?
- 14) In the past month, did you have intense feelings of sorrow or emotional pain because of the death, like pangs of grief?
- 15) In the past month, did you often get lost or absorbed in thoughts or daydreams about *[your spouse]*?

16) In the past month, have you felt shocked or stunned about the death? What about feeling emotionally numb, like you couldn't feel anything even if you wanted to?

17) In the past month, did you have difficulty having positive memories or thoughts about *[your spouse]*?

18) In the past month, did you feel bitter or angry about the death, or about something related to the death?

19) Have you had a wish to die in order to find or join *[your spouse]*?

20) Do you have difficulty trusting other people since *[your spouse]* died?

21) Do you feel confused or uncertain about your role in the world or your identity since *[your spouse]* died?

22) Do you find it difficult to pursue interests or plan for the future?