Smiling and snarling: Contextual-responsivity in emotional expression as a predictor of adjustment to spousal loss

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ABSTRACT

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Why do some people experience more emotional distress than others after spousal-death? And can we predict who will struggle more than others? While many will exhibit resilience in the wake of a bereavement, a small but notable portion ranging from 7-10% (Maciejewski, Maercker, Boelen & Prigerson, 2016; Nielsen et al., 2017) experience a prolonged period of elevated symptoms and distress (Bonanno et al. 2007; Prigerson et al., 2009). Although there is marked individual variation in the grief course, little is yet known about the mechanisms underlying grief that endures, and why some people will struggle more than others after experiencing the death of a spouse. Compelling findings have linked deficits in emotion regulation with the development of psychopathology (Buss, Davidson, Kalin, & Goldsmith, 2004; Gehricke, & Shapiro, 2000), and the study of one particular form of emotion regulation, contextually responsive emotional responding, may be particularly promising in predicting divergent individual differences in the grief course following the death of a spouse (Bonanno & Burton, 2013).

Recent bereavement studies have provided preliminary evidence linking contextually responsive emotional expression to grief-related adjustment. However, these studies suffer from notable methodological limitations, such as the use of limited measures of emotional expression or cross-sectional design. The current study will use a longitudinal design to investigate whether individual differences in emotional expressions of happiness and contempt, across varied contexts, can predict long-term adjustment and psychopathology. In addition, we will employ a

standardized facial coding system to investigate contextually unresponsive facial behaviors, which we operationalize as the mismatch between facial expression of emotion and four systematically varying idiographic contexts.

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I – Introduction

In recent years a great deal of literature has emerged showing that emotion regulation processes inform adjustment, and predict health and pathology (Aldao & Dixon-Gordon 2014; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Kashdan & Rottenberg, 2010). This has led to a tendency in the literature to classify certain emotions and regulatory strategies as either inherently adaptive or maladaptive (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Expressions of *positive* emotion have been consistently linked with enhanced interpersonal functioning (Fredrickson & Levenson, 1998), greater cooperation with others (Forgas, 1998; Rand, Kraft-Todd, & Gruber, 2015), and a buffering effect against psychopathology and ill health following aversive events and stress (Bonanno, Pat-Horenczyk, & Noll, 2011; Brosschot & Thayer, 2003; Fredrickson, Cohn, Coffey, Pek & Finkel, 2008; Ong, Bonanno & Bergeman, 2014). Expression of negative emotion, on the other hand, has repeatedly fallen into the maladaptive category. Negative outcomes of negative emotions have been widely reported to include binge-eating (Nicholls, Devonport & Blake, 2016), depression (Joormann & Quinn, 2014; Rottenberg, Gross & Gotlib, 2005), psychophysiological reactivity resulting in aggression or violence (Lemerise & Dodge, 1993), and anxiety (Aldao, Nolen-Hoeksema & Schweizer, 2010; Mennin, Heimberg, Turk, Fresco, 2005).

Categorizing emotion responses as "good" or "bad" represents an over-simplified view of emotion regulation, and fails to capture both the fluctuating environmental demands that must be navigated and the important role of context in determining whether an emotional response will have adaptive or maladaptive outcomes (Kashdan, & Rottenberg, 2010). Emerging concepts of regulatory flexibility suggest that the ability to *flexibly* employ various strategies and emotions

depending on the demands of the context will determine the effectiveness of the strategy, rather than the strategy or emotion itself (Aldao, 2013; Bonanno & Burton, 2013; Bonanno et al., 2004). Within the regulatory flexibility frame, emotions are thought to foster adaptation to environmental demands, and as such, the ability to respond appropriately to context is a critical component. We refer to this ability to shift emotional responses in accordance with the demands or opportunities imposed by differing contextual changes as *contextual-responsivity*.

In practical terms, various forms of psychopathology can be considered disorders involving a mismatch between emotional response and contextual demands – quite the opposite of contextual-responsivity. A prolonged grief presentation and other disorders such as PTSD, for example, typically involve the expression of emotion in inappropriate contexts. Expressions of fear are generally normative and useful, however when expressed repeatedly by an individual with PTSD in a safe setting, or at an inappropriate time, they become pathological (Davidson, Jackson, & Kalin, 2000). Similarly, in those experiencing grief, feelings of sadness or guilt are natural and expected, but the prolonged and continuous expression of sadness or guilt regardless of what the context demands, becomes problematic.

As research has progressed, studies incorporating context into their designs have provided further evidence supporting the notion that contextually responsive emotional expressions produce adaptive benefits and ameliorate social consequences (Bonanno & Burton, 2013). Conversely, studies examining contextually *un*responsive emotional expressions, for example, emotions that are expressed indiscriminately, or without consideration of changing contextual demands, have been associated with psychopathology, including depression, mania, and prolonged grief (Bonanno et al., 2007; Gruber, Johnson, Oveis, & Keltner, 2008; Rottenberg & Gotlib, 2004; Rottenberg, Gross & Gotlib, 2005). These interesting findings suggest that the

investigation of contextually responsive emotional expressions following a loss may offer possibilities in differentiating those who are resilient from those who develop grief-related psychopathology (Coifman & Bonanno, 2010).

The Role of Facial Expressions in Adjustment and Psychopathology

Facial expressions serve a crucial communicatory function, rapidly transmitting information to others. They modulate interpersonal behavior by conveying especially salient cues for interpreting and reinforcing behaviors, informing subsequent responses (Blair, 2003), and have been shown to evoke contagious responses in others to a considerable degree (Dimberg, Thunberg & Grunedal, 2002; Hess & Bourgeois, 2010). In a series of studies Anderson, Keltner, and John (2003) identified a convergence of emotional responses between romantic partners, and roommates, when compared to strangers. This was found both in response to independent emotional expressions and over time, and is thought to benefit relationships by coordinating thoughts, feelings, and interpersonal connections (Hatfield, Cacioppo, & Rapson, 1994; Keltner & Kring, 1998).

Humans appear to have evolved to show increased detection of social cues, specifically facial expressions, in order to avoid exclusion and increase connectedness and belonging. Relevant research has found that those with a dispositionally high need to belong to groups identify facial expressions better than those with less need to belong (Pickett, Gardner, & Knowles, 2004). Furthermore, those who experience social exclusion engage in emotion expression mimicry to mitigate further social detachment (Lakin, Chartrand, & Arkin, 2008), and are more attuned to discerning genuine smiles from other emotions, which can indicate

cooperative intent and signal the opportunity of re-affiliation (Bernstein, Sacco, Brown, Young & Claypool, 2010; Bernstein, Young, Brown, Sacco, & Claypool, 2008)

Emotional expressions appear to be particularly useful during times of adversity, providing an effective way to resolve problems or eliminate sources of distress. Facial expressions can elicit complementary emotions in observers, such as compassion in response to distress (Kennedy-Moore & Watson, 2001). The expression of sadness during acute bereavement, can elicit empathy and other helping responses from others, fostering support and enhancing the welfare of the bereaved individual (Bonanno, 2009; Coifman & Bonanno, 2009; Diminich & Bonanno, 2014). Similarly useful, contempt is aimed at excluding or distancing from someone and could be considered contextually responsive by limiting the negative impact of a friend or family member who violates community and hierarchical obligations (Fischer & Roseman, 2007; Hutcherson & Gross, 2011). On the other hand, positive emotional expressions in the appropriate context encourage social affiliation and cooperation, thus increasing the likelihood of gaining much-needed resources or support (Fredrickson, 2001; Rand, Kraft-Todd, & Gruber, 2015). Intra-personally, the expression of positive emotions can also serve a regulatory function by 'undoing' or reversing the effects of negative emotion (Fredrickson & Levenson, 1998).

Given that facial expressions serve several vital social adaptive functions, it is not surprising that deficits in the regulation of emotional expressions incur significant costs and have been identified in several psychological disorders. For example, individuals with depression have been shown to exhibit inflexible emotional responses, primarily, blunted expressions regardless of the demands of the environment (Rottenberg, Kasch, Gross, & Gotlib, 2002). Deficits have also been indicated in samples with generalized anxiety where elevations in expressivity of

negative emotion in comparison to healthy controls have been identified (Mennin, Heimberg, Turk, & Fresco, 2005). It appears that despite their potential usefulness, emotional expressions may extract pervasive psychological, and social costs if employed in a prolonged, extreme, or contextually inappropriate manner.

The current study was particularly interested in expressions of contempt and happiness, which appear to serve starkly different purposes – rejecting others and drawing others closer, respectively – and thus presumably result in distinct consequences and outcomes. Duchenne smiles indicate genuine happiness and signal affiliation leading to cooperation and helping responses from others (Fredrickson, 2001; Rand, Kraft-Todd, & Gruber, 2015). Non-Duchenne smiles, or false smiles, are less understood but appear to serve other helpful functions such as the communication of social politeness, or appeasement (Bonanno et al., 2002; Keltner, 1995). In contrast to both Duchenne and non-Duchenne smiles which strengthen relationships, the social function of contempt is to exclude and reject someone who is deemed incompetent or who violates community norms or hierarchical expectations from one's social network through derogation and ostracism (Fischer & Giner-Sorolla, 2016; Fischer & Roseman, 2007; Matsumoto, Hwang, Frank, 2016; Rozin, Lowery, Imada, & Haidt, 1999). Indeed, contempt expressions and expressions of positive emotion have been found to be directly inversely correlated in a bereaved sample (Bonanno & Keltner, 1997). Given these practically opposing functions, expressions of contempt and smiling provide an optimal opportunity to explore context effects.

Grief and Bereavement

The concept of contextual-responsivity suggests an obvious application to the task of adjustment to loss, particularly due to the ever-changing and varied demands associated with mourning and the aftermath of a death, which require variation in the type and the magnitude of the emotion expressed, rather than persistent feelings of distress. There are marked variations in individual responses to loss – in the weeks and months following a loss individuals may experience a range of dysphoric emotions, intense yearning for the deceased, dissociative responses, difficulty concentrating, and intrusive thoughts (Shear & Shair, 2005). Fortunately, many will resume normal functioning within a year of the loss, and will not require clinical intervention (Bonanno, Westphal, & Mancini, 2011). These individuals will transition from acute to integrated grief whereby they assimilate the loss, thoughts of the loss no longer dominate, and the bereaved re-engages in fulfilling and satisfying relationships and activities (Zisook & Shear, 2009).

However, a small but notable subset of up to 10% will continue to experience considerable distress for a prolonged period (Maciejewski, Maercker, Boelen & Prigerson, 2016; Nielsen et al., 2017). There is emergent consensus that a prolonged grief response is characterized by strong and persistent yearnings for the deceased, difficulty accepting the loss, avoidance of the reality of the loss, experiencing mistrust of others, feeling bitterness about the loss, and difficulty moving on with life (Prigerson et al., 2009). On a day to day level this may manifest as a lack of engagement in activities and interest in others, and an over-involvement in activities relating to the deceased, for example arranging the deceased belongings, daydreaming, etc. The bereaved may engage in excessive avoidance of places, people, or events that serve as reminders that the deceased is gone, may experience frequent intense pangs of painful emotion,

and may feel disconnected from those around them. Ironically, during a time when social support is particularly important, those with prolonged grief symptoms tend to pull away from those around them by virtue of their pre-occupation with the deceased, and avoidance of loss reminders. Furthermore, emotion dysregulation in the form of intense and persistent distressing emotions regardless of context can further alienate the bereaved individual in social situations and relationships.

The experience of grieving typically involves proscribed social rituals and cultural rules related to expressive behavior, that when deviated from can have dire social consequences (Bonanno, 2009; Rosenblatt, 2008). In Taiwan, for example, grief is viewed as an internal reaction that should not be exposed, and widows are discouraged from expressing outward signs of sadness in front of the body of the deceased (Hsu, Kahn, & Hsu, 2002). In contrast, most Americans would likely view sadness and anger as normative in the wake of a loss. Inherent in the sociocultural contexts that shape expressions of grief are clear expectations of emotional displays. On the one hand this allows the bereaved individual to communicate their needs and elicit support, and the observer to understand the signal and respond appropriately. On the other hand, perturbations to expected emotion responses may damage social bonds or elicit negative responses from others (Butler et al., 2003; Gottman & Levenson, 2002).

In addition to difficulties in the social realm, prolonged and chronic grief reactions have been linked with negative long-term outcomes across physical and psychological domains including decreased energy, cancer, high blood-pressure, increased suicidal ideation, and sleep problems (Boelen, & Prigerson, 2007; Germain, Caroff, Buysse, & Shear, 2005; Hardison, Neimeyer, & Lichstein, 2005; Prigerson et al., 1997; Silverman et al., 2000; Szanto et al., 2007). From a public health perspective, chronic grief incurs significant economic costs and is

associated with increases in health service use, and health care costs (Prigerson, Maciejewski, & Rosenhack, 2000). Given the detrimental consequences of persistent grief symptoms, it is important to better understand the factors that might predict divergent individual differences in the grief course following the death of a spouse.

Contextual-responsivity in Bereavement

The death of a spouse is a particularly compelling social nexus from which to study the role of contextual-responsivity of emotional expressions. The death of a spouse is at its core the loss of a significant attachment figure (Shear & Shair, 2005) and thus confronts the conjugally bereaved with the prospect of a dramatic alteration in their social world (Fraley & Shaver, 1999). The presence of an attachment figure, such as a spouse, serves important regulatory functions, coordinating and stabilizing affective, cognitive, behavioral, and physiological functions particularly during times of stress and adversity (Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Wearden, Cook, & Vaughan-Jones, 2003). In the unfortunate situation where the adverse event *is* the loss of the attachment figure, there is a disturbance in regulation, resulting in a state of internal disorganization. Those with chronic grief have difficulty re-organizing their internal working models of attachment and consequently their attachment behaviors (Bakermans-Kranenburg & Van Ijzendoorn, 2009; George & West, 2012; Ravitz et al., 2010). Intense and sometimes compulsive proximity seeking to the deceased becomes a pre-occupying pursuit, by default leaving little attention to assess the situational demands that would otherwise inform our emotional responses, so vital to receiving support from others.

Grief that endures is an example of contextually unresponsive emotional responding due to the inability to cease grieving in contexts where other emotions better suit the demands of the

environment. Conversely, contextually responsive responding following a bereavement would constitute the ability to *not* express negative emotions associated with grief in certain contexts. For example, the expression of anger may facilitate the restoration of just relations in contexts of injustice, and would reflect a contextually responsive response when dealing with a financial institution regarding a debt of the deceased (Lerner, Goldberg, & Tetlock, 1998). Likewise, the expression of contempt serves to reject or exclude and may be deemed appropriate in diminishing contact with a family member who refuses to attend a funeral service (Hutcherson & Gross, 2011). Whereas positive emotion signaling affiliation and evoking positive responses in others would likely be appropriate at the celebration of a grandchild's birthday party, and thus, contextually responsive (Frijda & Mesquita, 1994; Haviland & Lelwica, 1987; Matsumoto & Kudoh, 1993). However, the expression of anger or contempt at a birthday party, or happiness when dealing with financial issues in a bank or interpersonal conflict with family would constitute a mismatch, leading to negative consequences.

Recent bereavement studies have provided preliminary evidence for the link between contextually responsive expression of emotion and adjustment, however they have demonstrated notable methodological limitations, including the use of cross-sectional designs, and the employment of unstandardized, and inaccurate facial measurement methods.

Coifman & Bonanno (2010) conducted a longitudinal study analyzing emotional responses across a range of loss and non-loss contexts. They reported that contextually responsive negative emotion in negative contexts were predictive of fewer depression symptoms at 18 months, and expressions of positive emotion in non-loss positive contexts predicted fewer depression symptoms. While these are promising results, they measured facial expressions of emotion using a basic and unreliable coding method involving untrained coders. This

unstandardized approach does not provide an objective, or fine-grained measure of facial behavior; relying on inferences that untrained observers draw from looking at photos or videos, constitutes a failure to really examine what is occurring in the face, and fails to capture the nuances of subtle facial movements (Ekman, & Rosenberg, 1997). Because this method is dependent on generating subjective interpretations of expressions, and categorizing them as reflecting a certain emotion such as fear, it can lead to subjective, biased, and inaccurate data (Wolf, 2015).

Diminich and Bonanno (2014), in contrast, employed a standardized measure of facial expressions, the Facial Action Coding System (Ekman & Friesen, 1978), to investigate whether emotional responding in a contextually responsive manner 1.5-3 years after a loss was associated with a protracted grief course. They assessed this across several contexts asking participants to discuss their relationship with the deceased spouse and another attachment figure, however, they used a cross sectional design. They identified a pattern of expressive unresponsiveness in those endorsing symptoms of prolonged grief, and greater negative subjective reports of emotion in certain contexts, but due to the cross-sectional nature of the design, these findings are open to alternative interpretations. While the concurrence of contextually unresponsive expressions with enduring grief symptoms may well reflect a causal relationship (i.e., contextually unresponsive expressions causing persistent grief symptoms), it is also plausible that intense grief symptoms caused context insensitive expressions, or indeed that outcomes were caused by some other third unexplored factor. Cross-sectional designs are common in bereavement studies –they assess at just one time-point, and as such are faster, less labor-intensive, and less expensive to conduct (Stroebe, Stroebe, & Schut, 2003). However, in order to discern whether contextually responsive

emotional responses play a causal role in predicting long-term grief, a longitudinal design is necessary.

II - The Current Study

In the current study, we addressed the deficits in the literature by investigating the role of contextually responsive expressions of contempt and happiness in explaining divergent outcomes to spousal loss, using a standardized facial coding method, and a longitudinal design. Our study examined displays of emotion across four contexts in an idiographic laboratory interview where participants were asked to recall and speak about four events, for three minutes each – 1) a moment of intimacy with their deceased spouse, 2) a moment of intimacy with someone other than their spouse, 3) a moment of conflict with their deceased spouse, 4) a moment of conflict with someone other than their spouse. Idiographic methods are commonly used in clinical samples (Dougherty et al., 2004; Zubieta et al., 2003) due to their high degree of ecological validity (Barlow & Nock, 2009). Prior studies have often used standardized film stimuli and images to assess emotional behavior, however this has been criticized for its failure to produce intense emotional reactions due to the contrived laboratory setting. Idiographic interviews, in contrast, provide an interpersonal setting and increase the likelihood of eliciting spontaneous and authentic emotional expressions (Keltner, Kring, & Bonanno, 1999).

A significant methodological constraint common in the bereavement literature that was addressed in this study is the use of unreliable methods of facial expression measurement. To remedy this issue, we used a standardized measurement system for the analysis of facial expressions: the Facial Action Coding System (FACS), developed by Ekman and Friesen (1978). FACS is an anatomically based coding system that identifies individual muscle movements of the face, with each one identified as a numbered Action Unit (AU). This method provides the first standardized approach to spontaneous expression analysis. Through substantial exploratory

work, certain combinations of action units have been found to consistently correspond to prototypical expressions of emotions. However, it requires a substantial amount of training, and is laborious and time-consuming work, therefore many studies opt to use faster, easier methods of coding.

Of note, the FACS method allows researchers to distinguish highly nuanced emotional expressions – for example, genuine 'Duchenne' smiles, from false 'non-Duchenne' smiles – the former being associated with genuine positive emotion (happiness) and identified through the activation of both the orbicularis occuli cheek raiser muscles (AU6) and the zygomaticus major lip corner muscle of the mouth (AU12), whereas the latter are considered to be non-genuine smiles and engage only the zygomaticus major mouth muscle (AU12), not the orbicularis occuli (Duchenne deBologne, 1862; Ekman & Friesen, 1982; Ekman, Friesen & O'Sullivan, 1988). Non-Duchenne smiles have not yet been explored in relation to context in bereaved samples and were investigated in this study along with Duchenne smiles, and contempt.

The vast majority of bereavement research has been conducted cross-sectionally, which while useful in identifying interesting associations and providing preliminary evidence to suggest further investigation might be warranted, cannot identify specific factors that might be implicated in predicting outcomes in the years following a loss. In contrast, our study incorporated a longitudinal design, conducted at three time points over the course of 25 months, which allowed us to investigate emotional expressions early in bereavement, track the development of psychopathology over time, and determine the predictive value of emotional expressions in long-term adjustment and psychopathology. Dependent variables included a measure of grief approximately one (Time 2; T2) and two years (Time 3; T3) after the loss.

We predicted that contextually responsive expressions of emotions soon after the loss at Time 1 (3 months after loss; T1), would predict positive long-term outcomes at T2 and T3, (e.g. reduced grief). Conversely, we predicted that contextually unresponsive expressions of emotions soon after the loss at T1 would predict negative outcomes at T2 and T3 (e.g. greater grief). Contextually unresponsive expressions are operationalized as the mismatch between facial expression of emotion and the context, for example, the expression of contempt in the *Other* or *Intimacy* contexts, or smiling expressions in the *Conflict* contexts. Contextually responsive expressions are considered facial expressions of emotion that match the context (e.g. smiling in the *Intimacy* contexts).

We formulated hypotheses based on an accumulated body of research investigating outcomes of expressions of positive and negative emotions in positive and negative contexts. Previous research has indicated that expressing positive emotion in negative contexts is predictive of poorer outcomes. For example, Bonanno et al. (2007) found that positive emotion in general predicted overall well-being in a sample of childhood sexual abuse survivors, however when they took the context into consideration they found positive expressions when discussing a negative topic, were predictive of poorer social adjustment. Negative consequences of positive expressions have also been found in other negative contexts such as when watching a sad movie or listening to a partner in distress (Dutra et al., 2014; Gruber, Johnson, Oveis, & Keltner, 2008). In light of this research we hypothesized that expressions of Duchenne smiles in the conflict contexts in our study would predict a poorer outcome. In addition, based on prior findings that have shown that those who glean comfort from positive memories of a deceased spouse evidenced resilience (Bonanno, Wortman, & Nesse, 2004), we hypothesized that expressions of happiness in the intimacy contexts would predict better outcomes.

There are few investigations of context effects on contempt expressions, and therefore our hypotheses relating to contempt are primarily exploratory and based on theoretical research. While previous research suggests that some negative emotions such as anger may be adaptive in interpersonal conflict contexts as a means of forcing change and developing mutual satisfaction, contempt displays in similar circumstances may be maladaptive given their focus on rejection and social exclusion, leading to relationship deterioration (Fischer & Giner-Sorolla, 2016). Along these lines contempt has been reported to be more socially functional in non-intimate relationships that are not comprised of mutual care and commitment than in close relationships (Fischer & Roseman, 2007). If this is the case then we would hypothesize that expressions of contempt in intimacy contexts with spouse and other shortly after the loss would predict poorer outcomes (greater grief) at T2 and T3.

Furthermore, some studies have found evidence that contempt expressed during conflict in married dyads was found to predict marital dissatisfaction and divorce (Gottman, Coan, Carrere, & Swanson, 1998). While these data indicate negative consequences of contempt when discussing conflict relating to close relationships, unfortunately, it is not possible to know if and how these effects might translate to recounting past conflicts with a *deceased* spouse. Because the task of grieving involves a process of mental detachment from the deceased (Shear & Shair, 2005) it is possible that expressing contempt (which serves to create distance between individuals) may actually be adaptive in this context - as such we proposed competing hypotheses to address these seemingly contradictory possibilities. We hypothesized that expressions of contempt in the context of spouse conflict would predict greater grief at T2 and T3, and conversely, that expressions of contempt in the context of spouse conflict would predict less grief at T2 and T3. Because social relationships are so important to recovery from grief

(Zisook & Shear, 2007) we hypothesized that expressions of contempt might be especially costly in the context of conflict with others and would predict greater grief at T2 and T3.

Previous studies of context responsiveness in bereavement (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014) found that contextually unresponsive expressions were uniquely impactful to those struggling with elevated grief very early on – those with less grief who expressed similarly contextually inappropriate displays did not have the same negative outcomes. This pattern of findings is explained by the fact that bereaved people with high levels of initial grief are more likely to vary across time, whereas those with initially lower levels of grief will change less. We likewise predict the same pattern of findings for the current investigation.

III - Methods

Participants and Procedure

Conjugally bereaved participants were recruited through direct letter mailings based on public death notices in the New York metropolitan area. Letters described the study and asked potential participants to contact the researchers in order to either learn more information, or to determine eligibility for participation. Eligibility criteria stipulated that participants be between the ages of 25-65, living in North America, and have experienced the death of a spouse within the previous 2 to 4 months.

Respondents meeting inclusion criteria were assessed at three time points. Initially at T1, 2-4 months post-loss, they completed informed consent and a questionnaire by mail, and then attended an experimental session in the laboratory. This involved an idiographic interview, which was video recorded. At T2, 13-15 months post-loss, participants completed another questionnaire by mail, and then attended another experimental session in the laboratory (again, including an idiographic interview). This was followed by a third and final session (T3), 23-25 months post-loss, which involved completing a questionnaire, and a debriefing over the phone. Participants were paid $100 for each time point, totaling a maximum of $300. The sample had an average age of 55 years (*SD*=7.1 years) and average length of marriage of 24 years (*SD*=9.8 years). The sample were primarily Caucasian (89% Caucasian, 3% Asian, 5% African American, .6% Pacific Islander, 2.1% Hispanic, 2% Native American, Hispanic 5%), Catholic (Catholic 48%, Protestant 14%, Other Christian 7%, Jewish 12%, Muslim .6%, Buddhist .6%, No Religion 16%, Other Religion 3%), and female (Female 63%, Male 37%). An a priori power analysis was conducted and indicated that a total sample size of 114 would be suitable for detecting a medium sized effect (power = 0.80, $\alpha = .05$).

Idiographic Interview and Contexts

In order to assess emotional expressions across a variety of contexts, we used a video-recorded idiographic interview to prompt a discussion of four different topics, or contexts. The interviewer read from a script informing the participant that they would be asked to talk about their thoughts and feelings regarding a few specific events (See Appendix B). They were told that the interviewer would keep track of time and inform them when the time was finished (3 minutes per topic/context), and that if they ran out of things to say they should take a moment and try to think about anything else related to the topic that might come to mind. They were told that the best way to approach the task was to "try to relate as openly as possible whatever comes to your mind," and that the interviewer would seldom speak other than to ask clarifying questions.

In a fixed order, participants were asked to recall four specific events:

1) A moment of conflict with the deceased spouse (Spouse Conflict)
2) A moment of intimacy with the deceased spouse (Spouse Intimacy)
3) A moment of conflict with a person other than their spouse (Other Conflict)
4) A moment of intimacy with a person other than their spouse (Other Intimacy)

Once they identified the event, they were instructed to describe the event, and their reaction to it.

Facial Coding

Facial expressions were recorded during interviews by an unobtrusive wall mounted and remotely controlled camera. Video footage of four context topics was coded using the Facial Action Coding System (FACS; Ekman, Friesen, & Hager, 2002). FACS is an anatomically based

coding system that identifies individual muscle movements of the face, each one identified as a numbered Action Unit (AU). Prototypical emotional displays of genuine happiness (Duchenne smiles), non-genuine happiness (non-Duchenne smiles), and contempt, were determined by the presence of particular combinations of AU's as per the FACS investigator's guide, and previous research (Diminich & Bonanno, 2016; Ekman & Friesen, 1978; Gruber, Dutra, Eidelman, Johnson, & Harvey, 2011; Gruber, Johnson, Oveis, & Keltner, 2008)— Duchenne smiles (happiness; AU6 [cheek raiser]+AU12 [lip corner puller]), non-Duchenne smiles (AU12 [lip corner puller], without AU6 [cheek raiser]), and contempt (AU2 [outer brow raiser], +AU10 [upper lip raiser], +AU 25 [lips part] or AU2 [outer brow raiser], +AU14 [dimpler] or AU2 [outer brow raiser], +AU17 [chin raiser]).

According to standard FACS coding, videos were coded for the presence or absence of each AU activation per second. Separate frequency, intensity, and duration scores for each emotion and for each participant were calculated (See Table 4). Total frequency scores were calculated and adjusted for time given that some participants spoke for longer than others. Intensity of expression was measured on a 5-point likert scale of (1 = *Trace* to 5 = *Marked*) and a mean intensity score was calculated by averaging the mean scores of each expression of emotion within a given context. Mean duration was measured in number of seconds and was computed by averaging the mean durations of each expression within a context. To establish a single index for analyses, the frequency, intensity, and duration scores were standardized and summed to compute a single magnitude score for each emotion, in each context, for each participant. Coders were master's level graduate students in clinical psychology who had undergone a minimum of 100 hours of FACS training. They were blind to the hypotheses and purposes of the study, and footage was coded without sound. To establish reliability, all coders independently coded the

same 4 contexts for 5 subjects (20 segments), and remaining participants were then coded individually.

Questionnaires

Prior to each T1, T2, and T3 session, participants completed a self-report questionnaire screening for grief symptoms.

Prolonged Grief-13 (PG-13). The PG-13 (Prigerson et al., 2009; See Appendix C) is a 13-item scale that assesses emotional, cognitive, and behavioral states associated with prolonged grief symptoms. Using a 5-point likert scale (1=*Not at all* to 5= *Several times a* day), participants were asked to rate the frequency with which they had experienced each symptom in the past month, for example, 'how often have you felt yourself longing or yearning for the person you lost,' and 'have you had trouble accepting the loss?' Total scores ranged from 11-55, with higher scores reflecting the endorsement of more prolonged grief symptoms.

Data Analysis

The primary purposes of this study were 1) to investigate whether contextually *responsive* Duchenne smiles, non-Duchenne smiles and contempt expressions early in bereavement would predict less grief at T2 and T3, and 2) whether contextually *unresponsive* Duchenne smiles, non-Duchenne smiles and contempt expressions after spousal loss would predict increased grief at T2 and T3. Per previous research, it was expected that those struggling with high levels of grief symptoms soon after the loss at T1 would have poorer outcomes at T2 and T3 than those with fewer grief symptoms, who would remain stable showing little variability in symptomatology over time. As such, it was anticipated that T1 grief symptoms would moderate the effect of emotion expressions on T2 and T3 grief. To test this, a series of hierarchical multiple regressions were systematically conducted using the same procedure each time (Tables 1, 2, and 3 outline each step in all analyses). Preliminary analyses were also conducted to ensure no violation of the assumptions of linearity, multicollinearity normality and homoscedasticity.

The first step in each regression model included T1 grief symptoms. In step two, emotion expression in each of the four contexts (e.g. Contempt Spouse Conflict, Contempt Other Conflict, Contempt Spouse Intimacy, Contempt Other Intimacy) was added. Then, in order to observe the interaction between contextually responsive responding (i.e., by context) and initial T1 symptoms when predicting T2 or T3 symptoms, we included the interaction terms for the same emotion expression in four contexts with T1 symptoms (e.g. Contempt Spouse ConflictXT1 Grief, Contempt Spouse IntimacyXT1 Grief, Contempt Other ConflictXT1 Grief, Contempt Other IntimacyXT1 Grief). To probe the effects of different emotion expressions we ran separate models for Duchenne smiles, Non-Duchenne smiles, and Contempt expressions. To

interpret interactions, post-hoc simple slopes analyses for significant interaction effects were conducted according to Aikens and West (1991) methodology, in addition to the Johnson-Neyman technique (Bauer & Curran, 2005; Hayes & Matthes, 2009; Johnson and Fey, 1950) using Hayes' (2012) Process modelling software.

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IV – Results

As anticipated, several context-specific effects were identified indicating the importance of contextually responsive emotional responding, and significant interactions evidenced the predicted moderating influence of T1 grief symptoms.

Duchenne Smiles

We conducted a three-stage hierarchical regression to investigate the effects of Duchenne expressions on T2 grief (See Table 1). The model as a whole was significant, F (9, 103) = 12.57, $p < .001$, and explained 52% of the variance in T2 Grief. At stage one, T1 Grief contributed significantly to the model and explained 42% of the variance, F (1, 111) = 78.65, $p < .001$. Introducing the four Duchenne context variables in stage two explained an additional 3% of the variance, F (5, 107) = 16.99, $p < .001$, however, this change in R^2 was non-significant. In the third and final stage, adding the interaction variables explained a further 8% of the variance in the model, and significantly increased the variance explained by the model. We identified a main effect for Duchenne Smiles in the Spouse Conflict context in step 3, predicting less T2 Grief (β= -.734 p = .013), however, this effect was qualified by the following significant interaction between T1 symptoms and Duchenne expressions in Spouse Conflict, also in step 3.

The interaction between expressions of Duchenne Smiles and T1 Grief in the Spouse Conflict context, β= .939, $p < .002$, predicted increased T2 grief symptoms, and made a unique contribution of 5%. To probe the interaction, we calculated simple slopes and graphed significant interactions at 1 *SD* above and below the mean for T1 grief symptoms (See Figure 1). As Figure 1 indicated, among participants who had elevated grief symptoms at T1, greater magnitude of Duchenne smiles in the Spouse Conflict context predicted significantly increased grief at T2, b=

.61, $t(113)=2.28$, $p<.05$. By contrast, participants with Low T1 Grief showed a slightly decreasing but non-significant slope, $b=-.26$, $t(113)=-.88$, $p=.38$, indicating that for bereaved participants with relatively few initial grief symptoms, the magnitude of Duchenne smiles was not meaningfully related to T2 Grief. Duchenne smiles in the context of discussing conflict with the spouse is reasonably considered a contextually unresponsive expression. The interaction suggests however that the consequences of contextual-unresponsivity fall primarily among bereaved individuals with the highest T1 grief. To identify the point along the moderator where the relationship between Duchenne Smiles and the T2 Grief becomes significant, we employed the Johnson-Neyman procedure. This procedure indicated that when T1 grief scores are above 34, Duchenne Smiles and T2 Grief are significantly related, $t(113)=1.98$, $p=.05$, $b=.45$.

When we repeated this analysis using T3 Grief as the dependent variable, similar effects were observed (See Table 1). The model as a whole accounted for 43% of the variance, F (9, 119) = 10.07, $p < .001$, and the interaction variable demonstrated the greatest effect on the DV, $\beta = .794$, $p < .05$. The T1 Grief variable in step 1 accounted for 35% of the variance and indicated a positive relationship with the T3 Grief. Adding variables in step 2 and step 3 added an additional 4% and 4% of the variance respectively, though the overall increase in R^2 for step 2 was only marginally significant and for step 3 was not significant. A main effect for Duchenne smiles in the Other Conflict context emerged in Step 2 indicating a significant negative relationship with T3 Grief. However, this effect was not evident when the interaction variables were added in step 3. In step 3, a main effect for Duchenne Smiles in the Spouse Conflict context was observed and predicted less T3 Grief ($\beta= -.647$ $p = .03$), however, this effect was qualified by the significant interactions between T1 symptoms and Duchenne expressions in Spouse Conflict in step 3.

The interaction of Duchenne smiles in the Spouse Conflict context was significant, and made a unique contribution of 3%. The graphed interaction (see Figure 2) suggests that for those who had elevated T1 grief symptoms greater Duchenne smiles in the Spouse Conflict context again predicted greater grief at T3. By contrast, for those who had few initial grief symptoms an increase in Duchenne smiles did not appear to predict T3 Grief. However, post-hoc analyses of simple slopes only trended toward significance, Low T1 Grief, $t(129)=-1.06$, $p=.29$; High T1 Grief, $t(129)=.140$, $p=.16$.

Contempt

We repeated the same hierarchical regression procedure for Contempt expressions across contexts, again using T2 and T3 grief as the DV (See Table 3). When we regressed the contempt variables on T2 grief, only T1 Grief symptoms emerged as a predictor, $\beta= 644$, $p <.001$, $R^2=42\%$. When we regressed the contempt variables on *T3* Grief, in the first step T1 Grief was similarly significant and predicted 35% of the variance in the model. However, the addition of variables in step 2 explained a further 6% of variance. Interestingly, there was a significant positive effect on T3 grief for Contempt in Other Intimacy, $\beta= .276$, $p <.01$, and a negative effect on T3 grief for Contempt in Spouse Conflict, $\beta= -.193$, $p <.05$. These findings are again consistent with the construct of context-responsivity, as they indicate a negative impact on subsequent adjustment when emotional expression is not context-responsive (i.e., contempt in the context of intimacy) but a positive impact on subsequent adjustment when emotional expression is concordant with the context (i.e., contempt in the context of conflict).

In step 3 we entered the interaction variables, which increased R^2 by 4%, although the increase was only of marginal statistical significance. While the main effects for Contempt in Other Intimacy and Spouse Conflict from Step 2 were no longer evident when the interaction

variables were included in step 3, the interaction of expressions of contempt and T1 grief symptoms in the Other Conflict context was significant, β= .709, $p < .05$, part correlation=.15. We graphed the simple slopes of the interaction (See Figure 3) and found that when T1 grief symptoms were elevated there was a significant positive slope of Contempt on T3 Grief, b= .72, $t(129)=2.28$, $p<.05$, indicating that at higher levels of initial grief Contempt expressions predicted increased grief at T3. For those with relatively few T1 grief symptoms there was a non-significant negative relationship with T3 Grief, b=-.33, $t(129)=-.9361$, p=.35. The Johnson-Neyman procedure indicated that the point along the moderator where the relationship between Contempt and T3 Grief becomes significant, is when T1 grief scores are above 34, $t(129)=1.98$, p=.05, b=.53.

Non-Duchenne Smiles

Hierarchical regressions investigating the predictive value of Non-Duchenne Smiles revealed a significant effect for T1 grief on T2 Grief, β= .640, $p <.001$, R^2=42% , and T1 Grief on T3 Grief, β= .661, $p <.001$, R^2=35%.

Table 1

Predicting T2 and T3 Grief with magnitude of Duchenne smiles

Variable	*B*	*SE B*	*β*	sr^2	*r*	R^2	ΔR^2
Analysis of Duchenne expressions for T2 Grief							
Step 1						.42	-
T1 Grief	0.64***	0.07	0.64	.41	.64		
Step 2						.44	.03
T1 Grief	0.62***	0.07	0.63	.38	.64		
Duchenne (OtherConflict)	-0.48	0.26	-0.16	.02	-.11		
Duchenne (OtherIntimacy)	0.08	0.25	0.03	.00	-.01		
Duchenne (SpouseConflict)	0.46†	0.28	0.15	.01	.15		
Duchenne (SpouseIntimacy)	0.03	0.28	0.01	.00	.01		
Step 3						.52	.08**
T1 Grief	0.60***	0.07	0.61	.35	.64		
Duchenne (OtherConflict)	-0.14	0.95	-0.05	.00	-.11		
Duchenne (OtherIntimacy)	-0.76	0.6	-0.25	.00	-.01		
Duchenne (SpouseConflict)	-2.28*	0.90	-0.73	.03	.15		
Duchenne (SpouseIntimacy)	0.92	0.94	0.30	.01	.01		
Duchenne (OtherConflict)XT1 Grief	-0.01	0.03	-0.09	.00	-.10		
Duchenne (OtherIntimacy)XT1 Grief	0.03	0.03	0.28	.01	.04		
Duchenne (SpouseConflict) XT1 Grief	0.10**	0.03	0.94	.05	.23		
Duchenne (SpouseIntimacy)XT1 Grief	-0.04	0.03	-0.34	.01	.02		
$F(9, 103) = 12.57, p < .001$							
Analysis of Duchenne expressions for T3 Grief							
Step 1						.35	-
T1 Grief	0.66***	0.08	0.59	.35	.59		
Step 2						.40	.05†
T1 Grief	0.64***	0.08	0.57	.32	.59		
Duchenne (OtherConflict)	-0.81**	0.28	-0.24	.04	-.21		
Duchenne (OtherIntimacy)	-0.19	0.28	-0.06	.00	-.10		
Duchenne (SpouseConflict)	0.33	0.30	0.10	.00	.04		
Duchenne (SpouseIntimacy)	0.19	0.31	0.06	.00	-.05		
Step 3						.43	.04
T1 Grief	0.61***	0.08	0.55	.29	.59		

Duchenne (OtherConflict)	-0.34	1.08	-0.10	.00	-.21
Duchenne (OtherIntimacy)	0.31	0.98	0.09	.00	-.10
Duchenne (SpouseConflict)	-2.26*	1.03	-0.65	.03	.04
Duchenne (SpouseIntimacy)	0.64	1.07	0.19	.00	-.05
Duchenne (OtherConflict)XT1 Grief	-0.01	0.04	-0.12	.00	-.21
Duchenne (OtherIntimacy)XT1 Grief	-0.02	0.03	-0.15	.00	-.09
Duchenne (SpouseConflict) XT1 Grief	0.09**	0.04	0.80	.03	.11
Duchenne (SpouseIntimacy)XT1 Grief	-0.02	0.04	-0.17	.00	-.04
$F\ (9, 119) = 10.07, p < .001$					

Note. T2= 14 months post-loss; T3=25 months post-loss. †=$p \leq .06$, *=$p \leq .05$; **=$p < .01$; ***=$p < .001$

Table 2

Predicting T2 and T3 Grief with magnitude of Non-Duchenne smiles

Variable	*B*	*SE B*	*β*	sr^2	*r*	R^2	ΔR^2
Analysis of Non-Duchenne expressions for T2 Grief							
Step 1						.42	-
T1 Grief	0.64***	0.07	0.65	.41	.64		
Step 2						.42	.01
T1 Grief	0.64***	.07	0.65	.42	.65		
Non-Duch (OtherConflict)	-0.17	0.30	-0.05	.00	-.02		
Non-Duch (OtherIntimacy)	0.19	0.28	0.06	.00	.01		
Non-Duch (SpouseConflict)	-0.05	0.28	-0.02	.00	.02		
Non-Duch (SpouseIntimacy)	0.14	0.29	0.04	.00	.03		
Step 3						.47	.05
T1 Grief	0.69***	0.08	0.70	.44	.64		
Non-Duch (OtherConflict)	0.63	0.97	0.19	.00	-.02		
Non-Duch (OtherIntimacy)	-0.64	1.01	-0.21	.00	.01		
Non-Duch (SpouseConflict)	-0.63	0.98	-0.20	.00	.02		
Non-Duch (SpouseIntimacy)	-1.86	1.13	-0.58	.01	.03		
Non-Duch (OtherConflict)XT1 Grief	-0.03	0.03	-0.28	.00	-.04		
Non-Duch (OtherIntimacy)XT1 Grief	0.03	0.04	0.27	.00	.02		
Non-Duch (SpouseConflict) XT1 Grief	0.02	0.03	0.19	.00	.03		
Non-Duch (SpouseIntimacy)XT1 Grief	0.07	0.04	0.66	.02	.03		
$F(9, 103) = 9.94, p < .001$							
Analysis of Non-Duchenne expressions for T3 Grief							
Step 1						.35	-
T1 Grief	0.66***	0.08	0.59	.35	.59		
Step 2						.37	.02
T1 Grief	0.67***	0.08	0.60	.36	.59		
Non-Duch (OtherConflict)	-0.33	0.32	-0.09	.01	-.07		
Non-Duch (OtherIntimacy)	0.48	0.31	0.14	.01	.02		
Non-Duch (SpouseConflict)	-0.19	0.31	-0.05	.00	-.04		
Non-Duch (SpouseIntimacy)	-0.15	0.31	-0.04	.00	-.05		
Step 3						.40	.03
T1 Grief	0.69***	0.08	0.61	.35	.59		
Non-Duch (OtherConflict)	0.97	1.08	0.27	.00	-.07		
Non-Duch (OtherIntimacy)	-0.32	1.12	-0.09	.00	.02		
Non-Duch (SpouseConflict)	-1.94	1.09	-0.55	.02	-.04		
Non-Duch (SpouseIntimacy)	-0.50	1.26	-0.14	.00	-.05		
Non-Duch (OtherConflict)XT1 Grief	-0.05	0.04	-0.39	.01	-.12		
Non-Duch (OtherIntimacy)XT1 Grief	0.03	0.04	0.23	.00	.01		

Non-Duch (SpouseConflict) XT1 Grief	0.06	0.04	0.53	.01	-.03
Non-Duch (SpouseIntimacy)XT1 Grief	0.01	0.04	0.12	.00	-.07
$F(9, 119) = 8.68, p < .001$					

Note. T2= 14 months post-loss; T3=25 months post-loss. †=$p \leq .06$, *=$p \leq .05$; **=$p < .01$; ***=$p < .001$

Table 3
Predicting T2 and T3 grief with Contempt expressions

Variable	*B*	*SE B*	*β*	sr^2	*r*	R^2	ΔR^2
Analysis of Contempt expressions for T2 Grief							
Step 1						.42	-
T1 Grief	0.6***	0.07	0.64	.41	.64		
Step 2							
T1 Grief	0.63***	0.07	0.63	.40	.64	.44	.02
Contempt (OtherConflict)	0.14	0.31	0.05	.00	.08		
Contempt (OtherIntimacy)	0.36	0.31	0.12	.01	.15		
Contempt (SpouseConflict)	-0.34	0.31	-0.11	.01	-.01		
Contempt (SpouseIntimacy)	0.16	0.29	0.05	.00	.12		
Step 3						.46	.03
T1 Grief	0.62***	0.07	0.62	.37	.64		
Contempt (OtherConflict)	0.43	1.04	0.14	.00	.08		
Contempt (OtherIntimacy)	-0.95	1.09	-0.32	.00	.15		
Contempt (SpouseConflict)	0.92	1.22	0.29	.00	-.01		
Contempt (SpouseIntimacy)	-1.25	0.97	-0.41	.01	.12		
Contempt (OtherConflict)XT1 Grief	-0.01	0.03	-0.10	.00	.09		
Contempt (OtherIntimacy)XT1 Grief	0.05	0.04	0.47	.01	.17		
Contempt (SpouseConflict) XT1 Grief	-0.05	0.04	-0.43	.01	-.02		
Contempt (SpouseIntimacy)XT1 Grief	0.05	0.03	0.46	.01	.16		
$F(9,103)=9.92$, $p<.001$							
Analysis of Contempt expressions for T3 Grief							
Step 1						.35	-
T1 Grief	0.66***	0.08	0.59	.35	.59		
Step 2						.41	.06*
T1 Grief	0.64***	0.08	0.58	.33	.59		
Contempt (OtherConflict)	0.20	0.33	0.06	.00	.11		
Contempt (OtherIntimacy)	0.93**	0.33	0.28	.04	.23		
Contempt (SpouseConflict)	-0.68*	0.33	-0.19	.02	-.03		
Contempt (SpouseIntimacy)	0.01	0.31	0.00	.00	.13		
Step 3						.46	.04†
T1 Grief	0.63***	0.08	0.56	.31	.59		
Contempt (OtherConflict)	-2.13*	1.09	-0.62	.03	.11		
Contempt (OtherIntimacy)	0.41	1.15	0.12	.00	.23		
Contempt (SpouseConflict)	1.33	1.28	0.38	.00	-.03		
Contempt (SpouseIntimacy)	-0.91	1.02	-0.26	.00	.13		
Contempt (OtherConflict)XT1 Grief	0.08*	0.04	0.71	.02	.16		
Contempt (OtherIntimacy)XT1 Grief	0.02	0.04	0.14	.00	.25		

Contempt (SpouseConflict) XT1 Grief	-0.07	0.05	-0.58	.01	-.02
Contempt (SpouseIntimacy)XT1 Grief	0.03	0.04	0.30	.01	.17
F (9, 119) = 11.08, p < .001					

Note. T2= 14 months post-loss; T3=25 months post-loss. †=$p \leq .06$, *=$p \leq .05$; **=$p < .01$; ***=$p < .001$

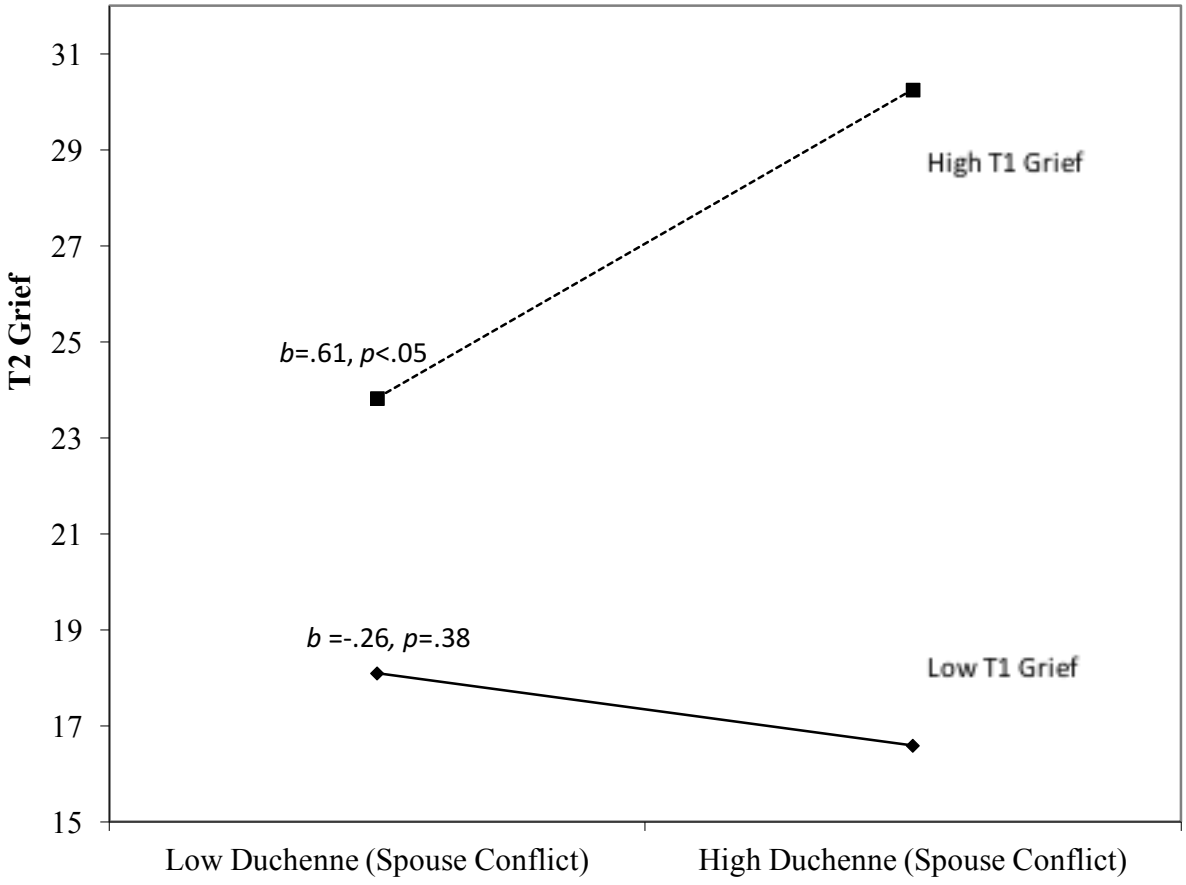

Figure 1. Duchenne smiles in the Spouse Conflict context predicts T2 grief symptoms in those with high T1 grief

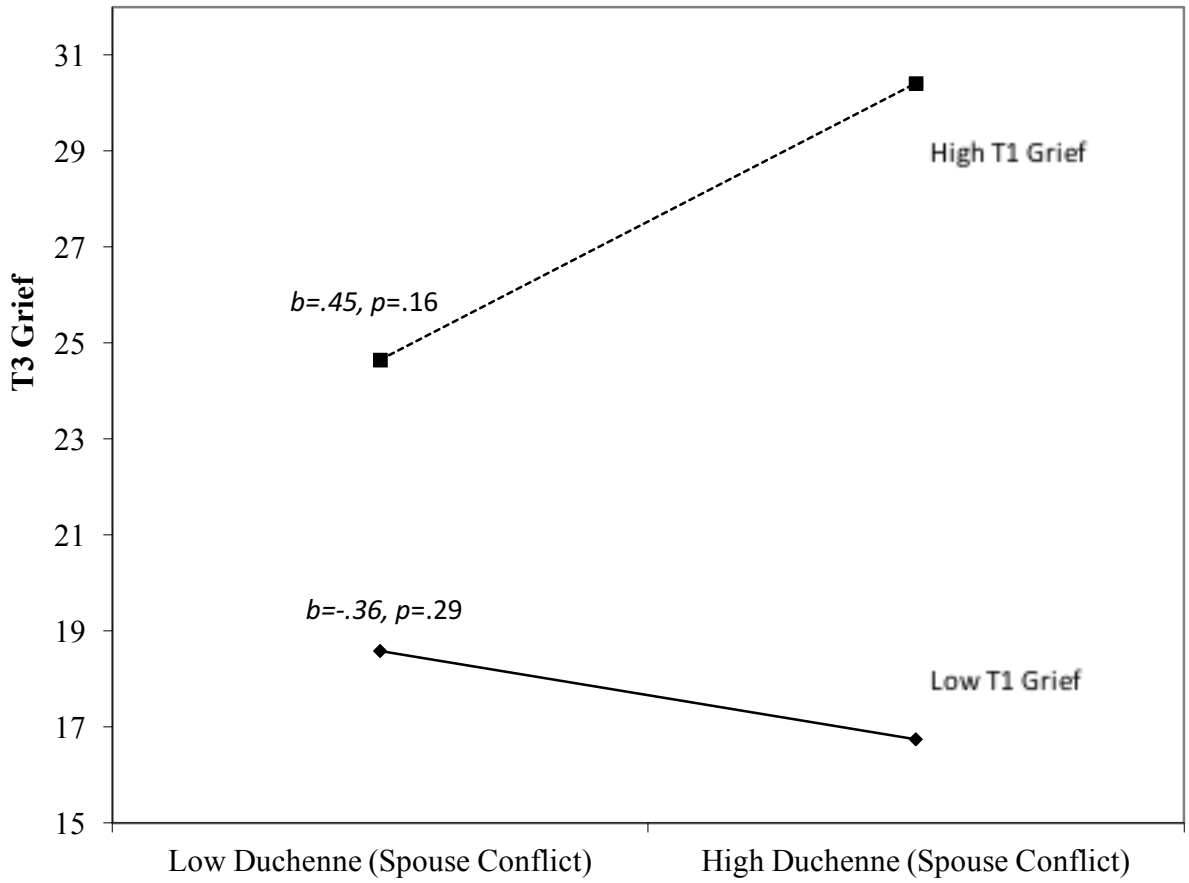

Figure 2. Duchenne smiles in the Spouse Conflict context predicts T3 grief symptoms in those with high T1 grief

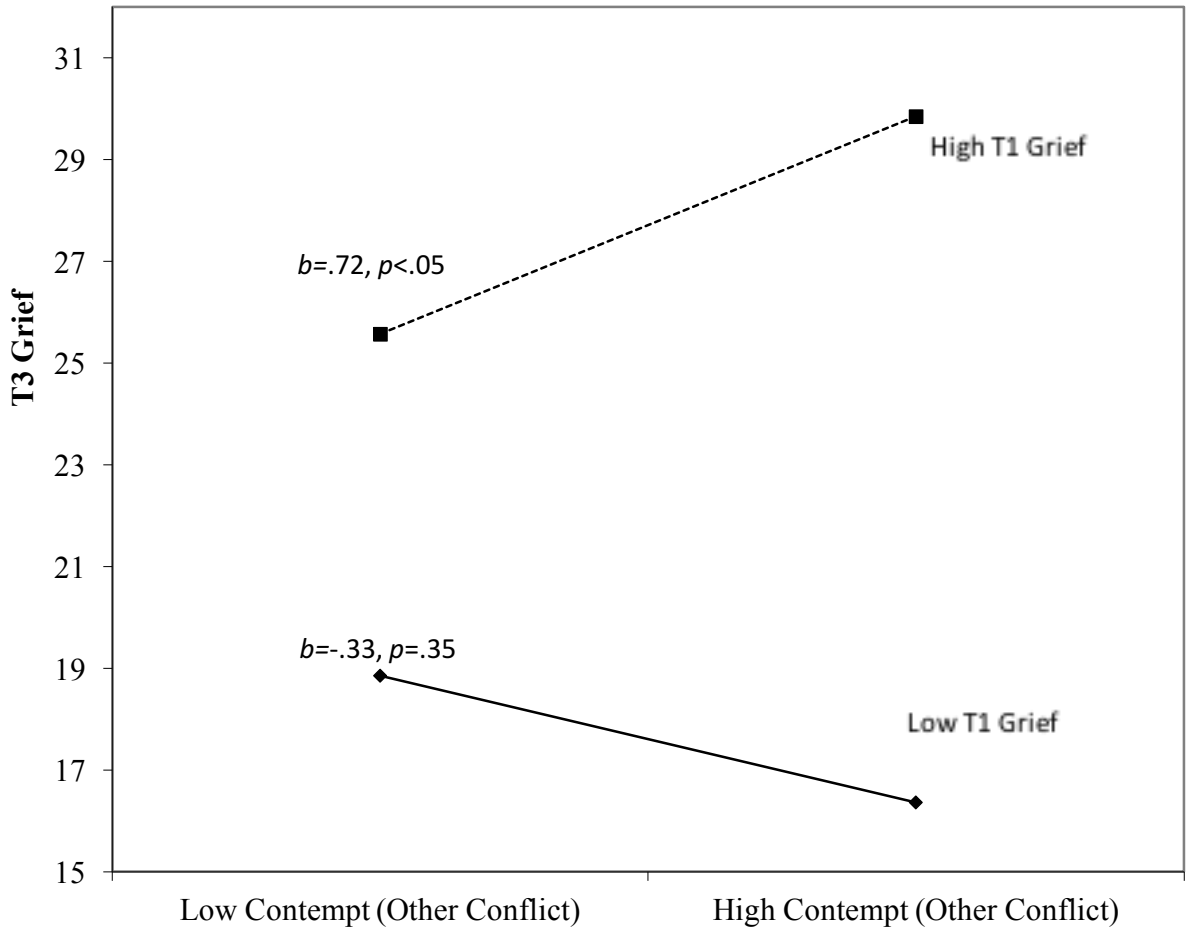

Figure 3. Contempt in the Other Conflict context predicts T3 grief symptoms in those with high T1 grief

V – Discussion

Little is yet known about why some people will continue to experience prolonged distress after experiencing the death of a loved one while others will resume normal functioning relatively quickly. To advance research on individual differences in the grief course, in the current investigation we tested predicted relations between contextually responsive and unresponsive expressions of happiness and contempt and differential longitudinal grief outcomes in a conjugally bereaved sample. Using a longitudinal design, we employed a standardized facial coding method to assess participant emotional displays across contexts from an idiographic interview focused on either conflict or intimacy in relation to either the deceased spouse or a currently living important other person. Contempt and happiness expressions provided an ideal backdrop from which to explore contextual-responsivity due to their seemingly opposing functions – to reject (Fischer & Roseman, 2007) and to enhance affiliation (Rand, Kraft-Todd, & Gruber, 2015), respectively. Our findings consistently pointed to the maladaptive role of contextually unresponsive expressions. That is, we found that contempt and genuine happiness expressed in an inappropriate context consistently predicted a worse grief course across time. Moreover, consistent with recent studies demonstrating the central role of contextually responsive facial displays in adjustment (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014), we found that these maladaptive effects were evidenced primarily for those with initially elevated grief symptoms.

In terms of more specific findings, expressions of genuine or "Duchenne" smiles in the context of discussing conflict with the deceased spouse significantly predicted greater grief both one and two years after the loss for those struggling with elevated T1 Grief. Displaying happiness when discussing a conflict runs contrary to social expectations, and can reasonably be

considered contextually unresponsive. Since facial expressions serve to communicate feelings and needs, and signal intention (Bernstein, Sacco, Brown, Young & Claypool, 2010; Blair, 2003; Lakin, Chartrand, & Arkin, 2008), a plausible explanation as to why mismatched expressions predict poorer grief outcomes may be that the message is ambiguous, making it difficult for the observer to infer their intentions. As a result, the bereaved individual may be characterized as unpredictable causing the observer to withdraw. This account is consistent with theories of psychological engagement (Kurzban & Leary, 2001), which posit that individuals possess a finite amount of capital to invest in their social network – in other words individuals can only provide so much support and resources (Tooby & Cosmides, 1996). As such, observers of contextually unresponsive expressions may consider it too risky to invest their limited capital in someone they have difficulty decoding and understanding, and ultimately decline to provide support to the bereaved.

Another related finding was that contempt expressions in the context of discussing conflict with an important living other predicted poorer outcomes with greater grief two years after the loss for those with higher levels of grief at T1. Similar to the expression of happiness when discussing Spouse Conflict, displays of contempt in Other Conflict constitute contextually unresponsive responding – expressing an emotion that serves to diminish contact and reject others at a time when social interaction and integration would serve them well, would be deemed a mismatch between the emotion and the demands of the context. We reasonably speculate that displaying contempt in relation to an other likely has the intended effect of rejecting and excluding the person from the expressor's social network, thus pushing away potential supports. Likewise, there is a risk that people observing expressions of contempt may attribute negative character traits to the expressor (Jost, Banaji, & Nosek, 2004), perceiving them to be lacking in

warmth and projecting a cold negative image, causing the observer to retreat from the bereaved individual (Fischer & Giner, 2016). Interestingly this effect was identified two years after the loss, but not at one, suggesting that perhaps the pushing away or withdrawal of others develops relatively slowly over time. It is possible that observers are already embedded in the bereaved individual's social network when the death occurs and are willing to provide some leeway to the bereaved individual by excusing or justifying excessive contempt responses, at least initially. In both of the above contexts, the bereaved individual is ultimately receiving less support, perhaps experiencing more social isolation, and having less opportunity to re-integrate socially and strengthen other attachments – all contrary to the task of the grieving process, which is to assimilate the loss, detach from the mental representations of the deceased spouse, develop new attachments, and re-engage in living a fulfilling and meaningful life.

As predicted, and in previous studies (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014), we found that contextually unresponsive expressions were uniquely impactful to those struggling with elevated grief very early on. This pattern is observed because bereaved people with high levels of initial grief are more likely to vary across time, whereas those with initially lower levels of grief will change less. This simple explanation aside, it is nonetheless compelling that context-responsive emotion did not appear to be a mere correlate of initial adjustment and rather consistently predicted long-term adjustment. If only relatively healthy people were able to express emotion in a contextually responsive manner, then we might conclude that this ability was simply a correlate of normal adjustment. However, since context-responsive expressions predicted long-term adjustment among those with higher initial grief, in this study and previous studies, we can conclude that this ability is still available to bereaved people who were struggling.

This pattern of findings suggests several potentially important clinical implications. First, our results highlight the potential utility of including questionnaire measures of context responsive and unresponsive behavior (e.g., Bonanno, Maccallum, Malgaroli, & Hou, 2018; Bonanno, Pat-Horencyzk, & Noll, 2011; Burton & Bonanno, 2016) in clinical assessments done early in the bereavement process. For many years treatment has been encouraged indiscriminately for bereaved people, even early in the grieving process (Shear & Shair, 2005). However, research on preventative interventions has found this approach to be ineffective (Jordan & Neimeyer, 2003; Wittouk, Autreve, De Jaegere, Portzky, & van Heeringen, 2011), and possibly even interfering of natural recovery from grief (Schut & Stroebe, 2005). Simply put, treatment was over-prescribed because it was unknown who would prove to be resilient and who would be at risk for developing prolonged grief symptoms. Acknowledging that individuals who show resilience following loss rarely if ever require intervention, our findings indicate that it is possible to parse apart bereaved individuals from those struggling with acute reactions who might nonetheless benefit from some form of early-intervention. At present, diagnosis and treatment of prolonged grief reactions is not possible until at least 6 months of bereavement using the ICD-11 diagnostic criteria for Prolonged Grief Disorder (Khoury, Kogan & Daouk, 2017) and not until one year using the DSM-V criteria for PCBD (American Psychiatric Association, 2013). However, bereaved individuals who are struggling earlier in the grieving process often seek clinical consultation. When this happens, identification of risk factors for possible prolonged grief reactions becomes imperative. Thus, the assessment of context unresponsiveness among those struggling with acute grief would help inform any clinical recommendations about ongoing assessment or the provision of other clinical supports.

Second, and in this same vein, our findings suggest the possibility that those with obvious

deficits in context responsivity could learn to improve this skill. This deficit could be addressed early on in bereavement as a preventative measure, or later in bereavement as a formal component of grief-focused therapy. Numerous treatments include components that target certain forms of emotion regulation, or indirectly target emotion regulation, such as Dialectical Behavior Therapy, Acceptance and Commitment Therapy, Emotion Regulation Therapy, Emotion Focused Therapy, and mindfulness-based interventions (Greenburg, 2002; Hayes, Strosahi & Wilson, 1999; Kabat-Zinn, 2003; Linehan, 2014; Mennin & Fresco, 2009). These treatments have been used effectively to treat a myriad of disorders— anxiety, depression, borderline personality disorder, however, they do not specifically target contextual-responsivity nor have they been systematically applied to a prolonged grief population. Likewise, treatments that have been geared towards grief have had some success by focusing on revisiting and accepting the loss, enhancing interpersonal relationships, and exploring aspirational goals (Shear, Frank, Houck, & Reynolds, 2005; Shear et al., 2014), however they fail to include modules or skills relating to emotion regulation. This provides an exciting opportunity for future research to investigate the effectiveness of emotion-regulation components of treatment and skills-based learning on contextual-responsivity of emotions in those who are identified as high-risk for developing prolonged grief, further informing what types of treatments could be developed with a view to facilitating recovery and preventing the prolonged grief.

This study had several important strengths. First, this study is one of the few bereavement studies that has employed a longitudinal design. We assessed participants three times over the course of approximately two years, which allowed us to investigate emotional displays early in the grief course and follow the development and maintenance of grief symptoms over time in order to determine the predictive value of emotional expressions in adjustment and

psychopathology. Traditionally, cross-sectional designs have been the design of choice in bereavement studies as they are faster to complete, less expensive, and less labor-intensive (Stroebe, Stroebe, & Schut, 2003). However, collecting data at just one time-point means that predictors cannot be identified, and leaves the findings open to alternative explanations. Because we used a longitudinal design, our findings have clear predictive value and significantly contribute to the literature in differentiating those bereaved individuals who may develop prolonged grief symptoms, from those who are resilient.

Second, this study used a standardized facial coding method – the Facial Action Coding System (FACS; Ekman & Friesen, 1978). Many other studies measuring facial expressions opt to use more subjective coding methods, which at best often miss nuanced expressions and at worst produce biased results (Ekman, & Rosenberg, 1997). In contrast, the FACS method we employed is a well-validated and standardized method of coding for emotional expressions. It requires approximately 100 hours of intensive training for coders and codes for movement of distinct muscles, not emotions, creating more objective data.

Despite these strengths a number of limitations should be noted. First and foremost, our sample was self-selecting and relatively homogenous. Unfortunately, the sample was not representative and lacked racial and religious diversity. Given that the grieving process is associated with prescribed social and cultural rituals and expectations, which differ between cultures, our findings may not be generalizable to other cultures.

Although inducing emotional states through idiographic methods has been found to elicit more authentic and ecologically valid responses (Barlow & Knock, 2009), this method affords less experimental control over the content of an individual's response. Because participants are prompted to discuss a particular context topic rather than being presented with an identical

stimulus such as a video, there is room for much variability in the content of responses. For example, when asked to discuss a moment of conflict with their deceased spouse a participant could have chosen to discuss a relatively insignificant conflict in comparison to others who may have discussed a very distressing conflict, and consequently expressed less negative emotion and more positive emotion than others. While the idiographic method is widely used (Coifman & Bonanno, 2010; Diminich & Bonanno, 2014; Dougherty et al., 2004; Keltner, Kring, & Bonanno, 1999; Zubieta et al., 2003) and has yielded consistent findings in relation to contextual-responsivity, future studies may benefit from the development and use of standardized techniques that also elicit authentic facial responses.

A further limitation of this study is that the data provide little information about how T3 grief may be mediated at T2. Our analyses fail to capture what exactly is occurring at T2 that may be driving effects at T3. Although this was beyond the remit of the current study, it would have been informative to have the data for facial expressions at T2 to determine whether effects on T3 Grief were still informed by contextual-responsivity of expressions at T2, or some other mediating factor, and warrants further study.

VI - Conclusion

We investigated contextual-responsivity of contempt and happiness expressions after spousal loss as predictors of longitudinal adjustment, and identified that contextually unresponsive expressions of contempt in the context of discussing conflict with others and genuine happiness in the context of discussing conflict with a spouse, predicted greater grief two years after the loss for those initially struggling with elevated grief symptoms. The findings of this longitudinal investigation add to the growing body of evidence suggesting that contextual-responsivity of

emotional expression is a possible mechanism in the development of prolonged grief and is predictive of adjustment after a loss. These findings have implications for both identifying those in need of treatment and developing targeted treatments for individuals who may be at risk for developing prolonged grief symptoms. The study of contextual-responsivity in bereaved individuals is relatively nascent and is ripe for future research to further refine and examine the ways in which mismatched emotional expression impact the development of psychopathology, and how context responsivity can be cultivated effectively through treatment.

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Appendices

Appendix A: Consent to be a Research Participant

Study title: Project to Understand Reactions to Loss

Funding source: National Institute of Mental Health, Washington, D.C.

We invite you to participate in a research study about bereavement, conducted at Teachers College, Columbia University, and funded by the National Institute of Mental Health. Our goals in this study are to better understand the course of experiences and difficulties people have during the first several years of bereavement as well as some of the factors that might inform these experiences. Some bereaved people have a more difficult time with grief than others. Some people struggle but recover quickly while other bereaved people suffer for longer periods of time. We are hoping to gain a better understanding of these differences and why they occur, for this reason we are interested in types bereavement reactions, from mild to severe.

It is important that you understand that nature of the study, and what you will be asked to do if you agree to participate, before you sign this form. Your signature indicates that you understand and agree to several general points: (a) your participation is entirely voluntary; (b) personal benefit to you mayor may not result from taking part in the study, but knowledge may gained from your participation that will be of benefit to others; (c) this is not a treatment study and you will not be offered any form of treatment by the investigators; and (d) you may withdraw from the study at any time without penalty or loss of any benefits to which you are otherwise entitled. The nature of the study and its purpose, procedures, duration, and potential benefits and risks, are discussed in detail below. You are urged to discuss any concerns or questions you may have about this study with a member of the research team. You may decide to delay signing this form until after you have had the chance to discuss your concerns or questions.

Time involvement and frequency of participation.

I understand that if I agree to participate in this study, I will be asked to engage in various tasks at 3 points in time: approximately 2 to 4 months after the occurrence of my loss, 14 months after my loss, and 25 months after my loss.

1. 2-4 months. For the initial component of the study, I will complete a number of self-administered questionnaires (60 minutes of my time) and visit the study's research office at Teachers College, Columbia University on two separate occasions to participate in face-to- face interviews and computerized tasks (2 hours per interview). Some of these tasks will be videotaped and will involve physiological measurements.

2. 14 months. For the second component, I will again visit the study's research office this time for a single occasion to complete additional tasks and additional face-to-face interviews (2 hours). Again, some of these tasks will be videotaped and involve physiological measurements.

3. 25 months. For the third component, I will either visit the study's offices or speak with someone from the research team over the phone, whichever I prefer, for an additional interview and a wrap-up session in which I will have additional opportunity to discuss any thoughts I may have had about participating in the study (30-60 minutes).

I understand that if additional funds become available, the researchers may contact at a future date to participate in a related study. I understand also that my providing consent for the procedures below does not any way obligate me to agree to any further study.

Content of the questions and interviews. I understand that I will be asked different types of questions, some requiring specific answers, such as rating how often I might have a particular experience on a 1 to 5 scale, and some requiring open-ended responses, such as describing my feelings and thoughts in response to a specific event. The content of the questions will pertain to my personal life and private thoughts and feelings, relationships with family and other people in my life, difficulties and symptoms I may have experienced in the past or in recent weeks, and how I cope with such difficulties or symptoms. Some questions will also pertain to my memories of, and current thoughts and emotions about, the person I had recently lost.

Computer tasks and interview sessions. I understand that I will participate in several sessions taking place at the project's offices at Teachers College, Columbia University. These sessions will include both interviews and computer tasks. At each of the times I visit the project offices, I will be asked a series of questions about my current state of mental health. In the other interview segments, I will be asked to speak about my experience of bereavement and about positive and negative experiences I may have had with my deceased spouse and with other important people in my life. I understand that there are no right-or-wrong answers to the interview questions. Rather the researchers are interested in virtually anything I have to say; the interview segments can be thought of as an opportunity for me to tell the researchers about my particular personal experiences both before and after my recent loss.

The sessions will also include my participation in a number of different computerized tasks. These tasks usually take about 20 minutes to complete, but the actual duration varies from person to person. These tasks are relatively simple. They do not require experience or skill in computer use and should be relatively easy for any person, regardless of previous experience with computers, to complete. As in the interview tasks, there are no right-or-wrong responses to the computer tasks. I understand that I may ask questions about what I am expected to do prior to these tasks and that the researchers will explain the purpose of the tasks in full detail once they are completed and also that I will be given a chance to ask more detailed questions about the tasks at that time.

The tasks will be explained in detail during the sessions. A brief description of each task is provided here so that I will have some idea of what I am consenting to do. As with all aspects of this study, however, I understand that I may decline to participate in or complete any of the tasks at any time. One of the tasks will involve my watching short videos on a computer monitor and ratings my reactions to the videos. Another task will involve my watching emotional pictures as they appear on the computer monitor. I understand that some of the pictures will depict positive events (e.g., people enjoying leisurely activities together) and some negative events (e.g., pictures depicting a violent crime). I will be asked to express my own personal reactions to the videos and to the pictures. For some of the pictures, I will be asked to either heighten or suppress the emotion I experience or show. For some of the pictures, I will not do anything except simply watch them as they appear. Another computer task will measure the speed at which I react to different words or objects on the computer monitor. This will involve the presentation of various words or objects on a computer screen. Another task will involve my being shown various shapes on the computer monitor and rating the quality of the shapes (i.e., rating the shapes I like best or like least). Finally, one of the tasks will involve my attempting to focus my attention to a cross that will appear on the center of the computer monitor and then detecting whether a small dot appears to the right or to the left of the screen.

Videotaping and physiological monitoring. I understand that I will be videotaped during some of these tasks and for some tasks I will also wear physiological electrodes. I understand also that I may refuse to be videotaped or to wear the physiological electrodes at any point. For the physiological measurements, my head size will be measured and I will have a net placed on my head that contains sensors within small sponges. These sit directly upon the scalp. The sponges are first soaked in a weak salt solution (potassium chloride) which helps pick up small electrical signals. The minute signals generated by brain activity are recorded through the sensors. Your brain activity will be recorded during some of the computer tasks described above in which you will view pictures or words on a computer screen.

Hair sample I understand that when I attend my 14-month appointment the researcher will request permission to collect a small hair sample from the crown of my head. I will be shown the size of the sample of hair requested (less than one half centimeter in diameter). I understand that my involvement in this aspect of the study is entirely voluntary and it is completely within my rights not to agree to provide a hair sample. I further understand that refusing to participate in this part of the study will not impact my participation in other parts of the study in any way. If I agree to provide a sample, an amount of this size shown or less will be taken as close to the scalp as possible. The sampled area should be easily covered up by styling. The sample will be analyzed to assess for cortisol levels, a hormone indicative of your body's chronic stress levels.

Location of the study. I understand that, during the initial assessment, I will be asked to complete the questionnaires at home or in another convenient location. I understand that the questionnaires need not be completed in a single sitting but may be worked on over a period of days as my schedule allows. I understand that the two interview and computer task sessions will be conducted at Teachers College, Columbia University, and that each should require about two hours of my time. I understand that portions of the interviews will be video and audio taped. I understand that the computer tasks will be relatively simple tasks that almost any person should be able to perform regardless of their level of experience or skill using computers.

Protection of Confidentiality and storage of materials

I understand that, to protect my confidentiality, I will be assigned a code number. The association of this code number with my name will be keep in a locked cabinet in a different location from the other materials in the study. This number will be used to identify all paper and videotaped records of my responses. I understand that my name will never be recorded directly on any of the questionnaire or taped material. The questionnaires and videotapes will be stored in a locked cabinet. Videotapes will be transcribed and all identifying material will be masked so that they will not include information that might identify me. For example, mention of a specific restaurant will be replaced with the generic term "restaurant." Finally, my actual written, videotaped, or transcribed materials will be viewed only by the principle investigator and members of the research team who have signed a statement promising to uphold confidentiality.

Monetary compensation

I understand that I will be paid a total of $300 for completing the entire study. Specifically, I will be paid $75 for completing the interviews and questionnaires at 2-4 months of bereavement, another $75 for completing the interview and questionnaires at 14 months of bereavement, and another $75 for completing the interview and questionnaires at 25 months of bereavement. I will also be paid an extra $25 at each time point as compensation for my assumed travel costs. The total compensation including the travel allotment is $300.00.

Additional benefits in participation

I understand that the researchers from this study cannot guarantee that there will be any direct benefit to me from participating in the study. I understand, however, that the knowledge gained from the study may foster a better understanding of the experiences and consequences of grieving the loss of a loved one and may contribute to the development of new societal and clinical interventions for bereavement. In that way, my participation may help alleviate the suffering of others.

Potential risks in participation

I understand that some of the questions I will be asked to respond to or to discuss will pertain to topics that I may find painful or difficult. I also understand that I will not be offered treatment by the investigators. However, I will be given an opportunity to discuss my reactions to the materials at the end of each interview/computer session. Additionally, at my request, the investigators will provide me with a list of treatment providers and support groups in the area specializing in bereavement.

As with all physiological recording, I understand that there is a minimal risk of electrical shock. This is minimized by using a special isolated amplifier, and ensuring that you are never connected to ground. There is a risk of skin irritation, minimized by careful choice of electrolyte, which is a simple salt solution. There is also a small risk of skin infection, minimized by careful and complete disinfection of electrodes. The sensor net will be wet when applied, and at first this man be slightly uncomfortable. However, I understand that towels will be provided so as to minimize discomfort and to protect your clothing. I also understand that should I feel uncomfortable or concerned with the next application or the procedures used, I may always feel free to discuss these with the experimenter. I also understand that I may stop the experiment at any time and that I may cease participating at any point with no penalty Whatsoever.

Means of addressing questions, complaints, or problems

I understand that, should any problems or questions arise with regard to the study or with regards to my rights as a participant in the research, I should contact the principal investigator:

George A. Bonanno, Ph.D. Department of Counseling and Clinical Psychology, Box 218, 525 West 120 St. Teachers College, Columbia University New York, NY 10027 (212) 678-3468

If I have any complaints or comments about my participation in this research project, I may also contact the Institutional Review Board at Teachers College, Columbia University:

Institutional Review Board Box 151 , 525 West 120 st. Teachers College, Columbia University New York, NY 10027 (212) 678-4105

Agreement and signatures

I understand that I may not necessarily know in advance how I will respond to any of the questions I am asked, or how long I may be willing to participate in the study. I also understand that I have the guaranteed right to

refuse to answer any or all of the written or interview questions at any point during the course of the study, that I may refuse to be videotaped at any time, and that I may withdraw from the study at any point. I understand that I may exercise these rights without penalty or loss of benefits to which I am entitled.

I understand that any information about my obtained as a result of my participation in this research will be kept as confidential as legally possible, as described above. I understand that my records of participation in this research are similar to hospital records in that they may be subpoenaed by court order or may be inspected by federal regulatory authorities.

I have read the explanation of this study carefully and have been given an opportunity to ask questions about participation in the study. My questions have been answered to my satisfaction. I hereby consent to take part in the study under the terms outlined above. (Note: the second copy of this form is for your records)

Participant's name (please print)	Participant's signature	Date
Investigator's name (please print)	Investigator's signature	Date

Appendix B: Idiographic Interview - Interviewer script

This portion of the interview will be open-ended. I am going to ask you to tell me more about your thoughts and feelings regarding a few specific events. There will be a specified period of time to respond to each question. However, you do not need to concern yourself with the time. I will keep track of the time and notify you when you can stop responding to the question.

You may respond in any way you wish, but please try to relate as openly as possible whatever comes to mind in response to the question.

We want to learn as much as possible about how you see things from your perspective. I will be listening carefully while you are talking but I will only speak to ask clarifying questions from time to time.

If at any time you go blank, or run out of things to say, just relax and give yourself time to think about anything else related to the topic question that might come to mind.

We are interested in anything you have to say in response to our questions. There are no correct answers. What we want here is your honest response to each question. As much as possible, we'd like to know what your particular experience might be like.

QUESTION 1 (3 MIN EACH): A CONFLICT EXPERIENCE - Spouse
The first question will take just a couple minutes. I would like you to think for a minute about an event in which you and (deceased spouse) were involved in an emotional conflict. This should be a specific event that you can remember. Does a conflict experience come to mind? [Any conflict experience will do -- Can you pinpoint a specific moment in time? A specific event?]
I'd like you to tell me for a few minutes about this event and how you reacted to it. Is that clear? [*PAUSE*] Please begin when you are ready [*START CLOCK*]

QUESTION 2 (3 MIN EACH): AN INTIMACY EXPERIENCE - Spouse
Thank you for your response. For the next question, I would like you to think for a minute about an event in which you felt very close to (deceased spouse). This should be a discrete event that you can remember. Does a moment like that come to mind? [Any experience of intimacy will do -- Can you pinpoint a specific moment in time? A specific event?]
I'd like you to tell me for a few minutes about this event and how you reacted to it. Is that clear? *[PAUSE*] Please begin when you are ready [*START CLOCK*]

QUESTION 3 (3 MIN EACH): A CONFLICT EXPERIENCE - Other
The next question will also take just a couple minutes. I would like you to think for a minute about an event in which you and someone else that you are close to were involved in an emotional conflict. This should be a discrete event that you can remember. Does a conflict experience come to mind? [Any conflict experience will do -- Can you pinpoint a specific moment in time? A specific event?]
I'd like you to tell me for a few minutes about this event and how you reacted to it. Is that clear? [*PAUSE*] Please begin when you are ready [*START CLOCK]*

QUESTION 4 (3 MIN EACH): AN INTIMACY EXPERIENCE - Other

Thank you for your response. For the next question, I would like you to think for a minute about an event in which you and a person other than your spouse experienced a moment where you felt very close to each other. This should be a discrete event that you can remember. Does a moment of closeness come to mind? [Any experience of intimacy will do -- Can you pinpoint a specific moment in time? A specific event?]

I'd like you to tell me for a few minutes about this event and how you reacted to it. Is that clear? [*PAUSE]* Please begin when you are ready [*START CLOCK*]

Appendix C: Prolonged Grief – 13

Part 1. For each item, please circle a number to indicate your answer.

	Not at all	At least once	At least once a week	At least once a day	Several times a day
1. In the past month, how often have you felt yourself longing or yearning for the person you lost?	1	2	3	4	5
2. In the past month, how often have you had intense feelings of emotional pain, sorrow, or pangs of grief related to the lost relationship?	1	2	3	4	5

3. For questions 1 or 2 above, have you experienced either of these symptoms at least daily since the loss?

_____ No
_____ Yes

4. In the past month, how often have you tried to avoid reminders that the person you lost is gone?	1	2	3	4	5
5. In the past month, how often have you felt stunned, shocked, or dazed by your loss?	1	2	3	4	5

Part 2. For each item, please indicate how you currently feel. Circle the number to the right to indicate your answer.

	Not at all	At least once	At least once a week	At least once a day	Several times a day
6. Do you feel confused about your role in life or feel like you don't know who you are (i.e., feeling that a part of yourself has died)?	1	2	3	4	5
7. Have you had trouble accepting the loss?	1	2	3	4	5
8. Has it been hard for you to trust others since your loss?	1	2	3	4	5
9. Do you feel bitter over your loss?	1	2	3	4	5
10. Do you feel that moving on (e.g., making new friends, pursuing new interests) would be difficult for you now?	1	2	3	4	5
11. Do you feel emotionally numb since your loss?	1	2	3	4	5
12. Do you feel that life is unfulfilling, empty, or meaningless since your loss?	1	2	3	4	5

Part 3. Place a checkmark to indicate your answer.

13. Have you experienced a significant reduction in social, occupational, or other important areas of functioning (e.g., domestic responsibilities)?

_____ No
_____ Yes