Loneliness and Emotional Flexibility Deficits in Bereavement

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The current study investigates whether the ability to enhance and suppress emotional facial expressions display cross-sectional associations with feelings of loneliness among spousal bereaved individuals 1.5 to 3 years after a loss. We compare bereaved individuals to a demographically similar married control group to examine whether the relationship between loneliness and emotional expression regulation is moderated by grief after controlling for the effects of relationship satisfaction and symptoms of PTSD/depression. We evaluate three dimensions of loneliness: emotional loneliness, social loneliness, and collective loneliness.
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INTRODUCTION

Loneliness is the aversive experience of isolation that is exceedingly common. Some estimate that roughly one-fifth of the population suffers from pervasive loneliness (Peplau & Perlman, 1982), though this rate may be much higher among older adults (Perissinotto, Cenzer, & Covinsky, 2012). Not only is loneliness highly prevalent, but it also associated with a variety of serious health consequences including mental illness (Peplau, Russell, & Heim, 1979), physiological stress (Steptoe, Owen, Kunz-Ebrecht, & Brydon, 2004), and cardiovascular disease (Sorkan, Rook, & Lu, 2002). There is even considerable evidence indicating that loneliness is a serious risk factor for early mortality that is as influential as smoking, obesity or a sedentary lifestyle (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Although increasing research attention investigating the profoundly deleterious effects of loneliness has produced a considerable body of literature (see Sbarra, 2015), some fundamental questions regarding loneliness in bereavement remain unexplored.

For many, the death of a loved one represents the permanent loss of an important social connection. In addition to being intimately associated with the negative feelings experienced during the course of bereavement, loneliness is an essential feature of grief that has been characterized as a prognostic indicator for more severe or longer lasting grief reactions (Prigerson, 1995; Stroebe, Stroebe, Abakoumkin, & Schut, 1996). Both loneliness and maladaptive grief reactions are associated with various impairments in self-regulation. Among non-bereaved individuals, loneliness is associated with deficits such as diminished emotion-regulation ability (Hawkley, Thisted, & Cacioppo, 2009), decreased ability to control attention (Cacioppo et al., 2000), and greater reliance on maladaptive emotion-regulation strategies such
as binge-eating (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Increased vigilance may account for some of the self-regulation deficits associated with loneliness. For example, lonely individuals display a visual attentional bias towards social threats while viewing social film clips (Bangee, Harris, Bridges, Rotenberg, & Qualter, 2014). In grief, more severe reactions to loss have been associated with deficits in regulating emotional facial expressions in response to evocative images (Gupta & Bonanno, 2011). A critical question that remains unanswered is whether loneliness is also associated with the specific emotion-regulation deficits observed in individuals displaying maladaptive responses to grief. Empirical evidence to suggest that loneliness might also be associated with these same expressive regulation deficits would provide further insight into the importance of loneliness in grief. This may also inform treatment considerations for individuals who experience persistent isolation in bereavement. To this end, identifying the specific kinds of loneliness that display the most robust associations with emotion-regulation deficits in grief is crucial.

There are several distinguishable types of loneliness and each may be uniquely associated with negative consequences in bereavement. Among bereaved individuals, emotional loneliness is far more influential than social loneliness in the development of depressive symptoms (Stroebe, Abakoumkin, & Schut, 1996) and suicidal ideation (Stroebe, Stroebe, & Abakoumkin, 2005). Because emotional loneliness appears to be of greater clinical significance when compared to the effects of social loneliness in grief, it may also display stronger associations with self-regulation deficits among the recently bereaved. Also, recent research has uncovered a third loneliness dimension known as collective loneliness (Hawkley, Browne, & Cacioppo, 2005). When considering the influence of collective cultural constructs and rituals in shaping the experience and perceived meaning of grief (Neimeyer, Prigerson, & Davies, 2002), the lack of
existing literature on collective loneliness in grief is surprising. Among non-bereaved individuals, some important clinical implications have been associated with the ability to feel connected to collective groups. For example, collective identification has been found to prospectively buffer against the development of the depressive symptoms (Cruwys, Dingle, Haslam, Haslam, Jetten, & Morton, 2013). Further research is necessary to explore the self-regulation implications of collective loneliness in grief.

The current study investigates whether deficits in both enhancing and suppressing emotional facial expressions display cross-sectional associations with feelings of loneliness among bereaved individuals 1.5 to 3 years after the loss, a period when the majority of individuals have resumed normal functioning (Bonanno, 2004; Bonanno & Kaltman, 2001). While there has been some debate about whether it is appropriate to label grief reactions as pathological, there has been evidence to suggest that a subset of individuals (10-15%) experience marked impairment one year after a loss that is distinct from mood and anxiety disorders (see discussion in Bryant, 2013). We will explore the relationship between loneliness and self-regulation deficits during this period and test whether any associations persist after controlling for the influence of relationship satisfaction as well as PTSD and depression symptoms. We also compare bereaved individuals to a demographically similar married control group to examine whether the relationship between loneliness and emotional expression regulation is moderated by grief.

We will evaluate three loneliness dimensions: emotional loneliness, social loneliness, and collective loneliness (Hawkley, Browne, & Cacioppo, 2005). The influence of collective loneliness in grief is understudied and further exploration of this dimension may provide insight into how this distinct perception of social connection may be associated with important mental
health consequences. Although many forms of objective social support are ineffective in reducing depressive symptoms and suicidal ideation in bereavement (Stroebe, Stroebe, & Abakoumkin, 2005), identifying with a broader collective group may be a distinct way in which individuals are able to resist loneliness after a loss. A fuller exploration of this possibility would provide clinicians with a broader understanding of the types of social connections that may be relevant to adaptive responses in grief. While the current investigation is exploratory in nature and limited by a reliance on cross-sectional data, it may stimulate further efforts to explore the effects of collective social identification during grief.
CHAPTER 1:

Review of the Literature

Section 1.1: Defining Loneliness

While it could be argued that almost everyone is familiar with at least some degree of loneliness, various attempts to define and measure the construct have produced several different perspectives. Early formulations framed loneliness as the consequence of objective shortcomings in a social network and described it as “the unpleasant experience that occurs when a person’s network of social relations is deficient in some important way, either quantitatively or qualitatively” (Perlman & Peplau, 1981). More recent perspectives have shifted away from an understanding of loneliness as simply the direct reflection of objective deficits in social support, and have instead stressed its subjective nature as a perception of social isolation (Dystra & Fokkema, 2007). Although oftentimes highly correlated, loneliness is independent from objective isolation and is not necessarily accompanied by any actual deficits in the availability of social support (Cacioppo & Hawkley, 2009; Paplau & Perlman, 1982). Some individuals are capable of living in solitary circumstances without feeling lonely, while others who possess a great number of social connections may still experience severe dissatisfaction and loneliness (Tornstam, 1992; Cacioppo et al., 2000; Coyle & Dugan, 2012; Perissinotto & Covinsky, 2014). To further highlight this distinction, the subjective perception of loneliness is associated with negative health consequences independently of objective measures of social support. In a recent meta-analysis of prospective studies by Holt-Lunstad, Smith, Baker, Harris, & Stephenson (2015), subjective perceptions of loneliness increased the risk of premature mortality even when controlling for the effects of objective measures of social isolation. In addition to objective social support, loneliness is significantly influenced by genetic factors (Boomsa, Willemsen, Dolan,
Hawkley, & Cacioppo, 2005), childhood environment (Bartels, Cacioppo, Hudziak, & Boomsma, 2008), and individual relationship preferences that impact the discrepancy between desired and actual relationships (Dystra & Fokkema, 2007).

An emphasis on the underlying subjective nature of loneliness has helped to facilitate comparisons with physical pain (Hawkley & Cacioppo, 2010), another highly subjective phenomenon (Wiech, Ploner, & Tracey, 2008). Beyond conceptual similarities, the intimate connection between loneliness and pain is supported by neuroimaging studies that reveal shared neural pathways underlying both physical pain and experiences of social rejection (Eisenburger et al., 2003). Cacioppo et al. (2006) argue that the evolution of the human need for social connection was facilitated by co-opting the existing brain circuits for physical pain (Eisenburger et al., 2003) and reward (Rilling et al., 2002). Physical pain may play an influential role in psychological disorders and recent research has uncovered a connection between chronic pain and brain inflammation in mesolimbic reward circuitry associated with mood and anxiety disorders (Taylor et al., 2015). While pain serves as a signal to alert an organism to physical damage, loneliness may have evolved in order to alert the individual to social deficits and motivate efforts to address threats that impair social integration (Hawkley & Cacioppo, 2010). Loneliness has been compared to the aversive states of hunger and thirst that organize and motivate efforts to seek food and water (Cacioppo, Cacioppo, & Boomsma, 2014).

Section 1.2: Dimensions of Loneliness

Within the overarching concept of loneliness, several distinguishable factors have been identified. Early theoretical work by Weiss (1975) emphasized the fundamental distinction between emotional and social aspects of loneliness. Emotional loneliness is characterized as the negative feelings of isolation that occur when an individual is deprived of the security provided
by close intimate connections. Heavily influenced by attachment theory, Weiss (1975) believed that *emotional loneliness* could only be alleviated by reconnecting with an important attachment figure. When bereavement severs connections to a unique attachment, alternate forms of social support may be inadequate compensation for the loss. During grief, the experience of *emotional loneliness* is described as a sense of “utter aloneness” that persists even when an individual is with other people (Stroebe, Stroebe, Abakoumkin, & Schut, 1996). In contrast, *social loneliness* involves a lack of engagement with networks that offer more generalized social support than that provided by intimate attachments.

Research has explored some of the distinct consequences associated with emotional and social dimensions of loneliness. Relying on longitudinal data of bereaved individuals, Stroebe et al. (1996) found that *emotional loneliness* mediated future increases in depressive symptoms while *social loneliness* did not. Also, greater availability of objective social support did not effectively buffer against the occurrence of depressive symptoms associated with *emotional loneliness*. Furthermore, Stroebe et al. (2005) found that *emotional loneliness*, but not social support, was associated with increases in suicidal ideation among the recently bereaved. While this does not categorically invalidate the practice of extending social support to the recently bereaved, it is crucial to acknowledge its limitations as an intervention to address serious symptoms. Also, there are alternative ways of perceiving social connection that are distinct from direct social support and may be consequential in grief.

Recent research has suggested that there exists a third factor of loneliness beyond the dimensions of *emotional loneliness* and *social loneliness*. Relying upon confirmatory factor analysis, Hawkley, Browne, and Cacioppo (2005) examined responses to a widely used loneliness questionnaire (R-UCLA Loneliness Scale; Russell, Peplau, & Cutrona, 1980) to
uncover three subscales that they believed to reflect individual and social levels of analysis. The individual level of analysis is comprised of a single intimate isolation factor (*emotional loneliness*), while the social level of analysis consists of two factors: relational isolation (*social loneliness*) and the additional *collective loneliness* factor, which had not been previously described in the literature. Intimate isolation (*emotional loneliness*) reflects isolation from close relationships while relational isolation (*social loneliness*) reflects perceived social support from a broader network. Among married individuals, intimate isolation (*emotional loneliness*) is associated with marriage status, while relational isolation (*social loneliness*) is associated with the number of close friends and relatives (Hawkley et al., 2005). While intimate isolation and relational isolation respectively correspond to *emotional loneliness* and *social loneliness*, the *collective loneliness* dimension reflects perceived connection to collective groups (Hawkley et al., 2005). These collectives are broader than the aggregate of face-to-face social interactions with individuals such as friends and family. Instead, *collective loneliness* involves wider collective groups wherein individual members may not even know one another (Hawkley et al., 2005).

The three factors of loneliness (*emotional loneliness*, *social loneliness* and *collective isolation*) are found to be distinguishable domains among ethnically diverse samples of younger and older adults in the United States (Hawkley et al., 2005). Interestingly, this factor structure is also found among a sample of younger and older adults in China (Hawkley, Gu, Luo, & Cacioppo, 2012). While it is reasonable to expect that the structure of loneliness would deviate significantly in the more collectivist Chinese culture, it is remarkable that even when examining older adults who were raised during the Chinese Consolidation Era and the Chinese Cultural
Revolution, *emotional loneliness* and *social loneliness* remained distinguishable from *collective loneliness* (Hawkley et al., 2012).

Outside bereavement, some research has provided a preliminary exploration of how relationship status may be an important contextual factor that moderates the associations of each loneliness factor. While intimate isolation (*emotional loneliness*) appeared lower overall among the married than unmarried, Hawkley et al. (2005) found that for unmarried individuals, the number for friends and relatives negatively predicted intimate isolation (*emotional loneliness*) and appeared to serve as an alternative input to protect against this facet of loneliness. Relationship status also moderates age effects of loneliness and Hawkley et al. (2005) found that unmarried individuals display less intimate isolation (*emotional loneliness*) with increasing age, while married individuals’ levels of intimate isolation (*emotional loneliness*) were more stable across time. Also, unmarried individuals displayed greater relational isolation (*social loneliness*) with increasing age, while married individuals again appeared more stable in this dimension. Although marriage status did not predict higher relational isolation (*social loneliness*), marriage was found to buffer against age-related increases of *social loneliness* (Hawkley et al., 2005).

Further research is necessary to explore the different factors of loneliness and how the context of bereavement may moderate the various relationships associated with them. The present study will examine these three factors of loneliness (*emotional loneliness, social loneliness and collective loneliness*) in bereavement and compare them to a married control group.

**Section 1.3: Collective Identity and Loneliness**

Maintaining social relationships is cognitively taxing due to the requirement that some recollection of past interpersonal interactions be maintained, and Dunbar (2014) argues that human beings are constrained by an upper limit of approximately 150 bilateral social
relationships of obligation and reciprocity. Despite this cognitive constraint, human beings regularly cooperate in groups that are far larger, and this may be possible though the use of collective labels (Moffet, 2013). The social connections perceived to be deficient in collective loneliness refer to group relationships that extend beyond the limit of approximately 150 bilateral social relationships (Cacioppo et al., 2015). These collective groups are broader than the aggregate of partners who can provide instrumental support or even maintain face-to-face communication. Examples of these groups are villages and armies that promote identification and cooperation during times of adversity (Cacioppo et al., 2015). This is aligned with the assertion by sociologist Peter Berger (2011) that the fundamental function of collective group cohesion is to facilitate resistance to adversity: “Every human society is, in the last resort, men banded together in the face of death” (2011, p. 52).

Analogous to ant colonies that rely upon chemical signals for cooperation, human societies facilitate cooperation in large collectives by employing a variety of labels or symbols to confirm group membership without the requirement that members actually knowing one another (Moffet, 2013). Group identities may be formed on a variety of factors including, but not limited to: a nationality, e.g. “an American,” an ethnic group, e.g. “an African American,” a religion, e.g. “a Muslim,” a profession, e.g. “a police officer,” a political party, e.g. “a Republican,” a cause, e.g. “a Black Lives Matters activist,” or an interest, e.g. “a Mets fan.” Individuals also engage in a plurality of labels that vary in salience depending upon contextual factors. The use of symbols to reaffirm collective identity appears to be particularly relevant during periods of adversity. For example, the rise in collective solidarity in the aftermath of the attacks on September 11, 2001 (broad approval of leadership and symbolic displays of patriotism) share interesting similarities in time-course patterns (peaking after one month and declining after six to nine months before
re-emerging during anniversaries or perceived threats) when compared to historical accounts of public reactions to the Japanese attacks on Pearl Harbor and the Confederate attack on Ft. Sumter (Collins, 2004).

Feeling connected to broader collectives and the formation of social identity wherein a group identity is internalized and individuals perceive themselves to be exemplars of a social category is a concept expressed by social identity theory (Tajfel & Turner, 1979) and the related self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Relying upon similar experimental methods employed by Aron, Aaron, Tudor, and Nelson (1991) to demonstrate that individuals appear to incorporate close relationship partners into a part of their own self-identity, Smith and Henry (1996) demonstrated that individuals also internalize aspects of in-groups into their self-concept.

While alleviating social loneliness may not be as important as emotional loneliness in bereavement, the ability to feel of connected with broader collectives represents a unique aspect of socially derived support and may have important implications that have not been previously examined. The lack of research on that the psychological consequences of collective isolation in grief is particularly surprising when considering the diverse array of collective mourning rituals that have been observed across cultures. Durkheim (1912) describes the function of funerary rituals in enhancing cohesion through the use of collective symbols that elicit group emotions of “collective effervescence” to produce “a sensation of renewed strength, which counteracts the original enfeeblement” (p. 405). Beyond rituals with a specific focus on death, mass gatherings for a variety of purposes are also found to enhance collective identification. Paez, Rime, Basabe, Wlodarcyk, and Zumeta (2015) investigated the effects of perceived emotional synchronicity in
mass gatherings and found that both positively-valanced (traditional folk marches) and negatively-valanced (protest marches) gatherings increased feelings of collective identification.

The fact that language is unable to fully express the emotional experiences associated with social relationships (Dunbar & Shultz, 2007) may partially account for the lack of attention paid to collective connection in grief. For example, there is no concise term to articulate the opposite of loneliness, just as there is no concise term for the lack of hunger or thirst (Cacioppo & Patrick, 2008). Although the subjective perception of adequate social connection (independent from objective social support) may be influential in grief, linguistic shortcomings may have impeded its identification as a specific resilience factor. While this problem is true of loneliness in general, collective loneliness may be further obfuscated by the additional abstraction involved when individuals identify with collective groups. A comprehensive understanding of the experience of grief requires a broad interdisciplinary perspective to evaluate a multifaceted matrix of individual and cultural meanings (Neimeyer, Prigerson, & Davies, 2002). The investigation of the role of collective loneliness in bereavement is necessary and aligned with a recent resurgence of interest to explore the psychological influence of collective processes (Paez et al., 2015; von Scheve & Ismer, 2013; von Scheve & Salmela, 2014).

Research has explored some of the significant clinical consequences of collective identification among non-bereaved samples. Cruwys, Dingle, Haslam, Haslam, Jetten, and Morton (2013) examined longitudinal data and found that greater social identity formation negatively predicted the development of subsequent depressive symptoms as well as the reoccurrence of previously experienced depressive symptoms. Also, experimental manipulations that enhanced the salience of group membership was found to increase pain endurance during a cold-pressor task (Jones & Jetten, 2011) and provides further evidence that collective
identification exerts a psychological influence. Although support from intimate social networks was unable to buffer against the death of a close attachment (Stroebe, Stroebe, & Abakoumkin, 2005; Stroebe, Abakoumkin, & Schut, 1996), identifying with broader collective groups could potentially play an important role in bereavement.

Section 1.4: Consequences of Loneliness

Although there are different perspectives on the precise definition of loneliness, there is a general consensus that the phenomenon is accompanied by very serious physical and mental health consequences (Holt-Lunstad et al., 2015; Uchino, 2006). Lonely individuals display higher incidences of coronary conditions (Sorkan, Rook, & Lu, 2002), poorer recovery rates from cardiac surgery (Herlitz et al. 1998), and poorer overall cardiovascular health as measured by systolic blood pressure, cholesterol, and body mass index (Caspi et al., 2006). The physiological stress associated with loneliness has been recorded though the use of neuroendocrine, cardiovascular and inflammatory response measures (Steptoe et al., 2004). A number of prospective studies have even found loneliness to predict higher all-cause mortality rates (Patterson & Veenstra, 2010; Luo et al., 2012; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Loneliness is linked to mental health problems such as schizophrenia (Deniro, 1995), hypochondriasis (Brink, 1993) and depression (Cacioppo, Hawkley, & Thisted, 2010; Cacioppo, Hughes, Waite, Hawkley & Thisted, 2006; Peplau, Russell & Heim, 1979).

There are some questions about the nature of the relationship between loneliness and negative outcomes. While loneliness prospectively predicts later depressive symptoms after controlling for initial levels (Wei, Russell & Zakalik, 2005), there is some disagreement about whether the causal relationship is unidirectional. Cacioppo et al. (2006) found a reciprocal influence between depression and loneliness when employing latent growth models, while more
recent research that relied on a five-year cross-lagged analysis (Cacioppo, Hawkley, & Thisted, 2010) found that loneliness predicted later depression, but that depression was not predictive of later loneliness.

**Section 1.5: Loneliness and Self-Regulation**

Loneliness has been associated with disturbances in a variety of self-regulatory behaviors and several studies have focused on deficits in directing attention. The ability to redirect one’s attention is thought to be an early component in emotion regulation strategies that serves the function of distracting away from emotional aspects of a situation or changing internal focus (Gross, 1998). Self-reported loneliness has also been associated with hypervigilance for cues of social threats. Egidi, Shintel, Nusbaum, & Cacioppo (2006) found greater Stroop interference among lonely individuals for negative social words, when compared negative non-social words (as cited in Cacioppo, Cacioppo, Cole, Capitanio, Goossens, & Boomsma, 2014). Also, Yamada and Decety (2009) found that lonely individuals display greater sensitivity to painful facial expression in subliminal primes. In an eye-tracking study, Bangee, Harris, Bridges, Rotenberg, and Qualter (2014) found that lonely individuals display different gaze fixation patterns when compared to non-lonely control and spent more time focused on social threats while viewing film clips of interactions. Thus, lonely individuals may be unable to regulate their emotions by shifting attention away from perceived threats. This vigilance may also interfere with the ability to cooperate in social interactions by impairing the ability to regulate negative perceptions. Rotenberg (1994) found that lonely individuals, as measured by self-report scales, adopted a rigid perspective of mistrust and that they were less likely to adopt a tit-for-tat strategy to cooperate during trials of the Prisoner’s Dilemma game.
Cacioppo et al. (2000) found that lonely individuals, as measured by self-report scale, are less able than non-lonely controls to shift their attention during a dichotomous listening task that required them to identify vowel-consonant pairs. These deficits occurred only when subjects were asked to shift their attention to their non-dominant ear, and no differences were found when stimuli were presented to the subjects’ dominant ear. This suggests that loneliness disrupts the ability to intentionally deploy attention while automatic attention processes are unaffected. It is important to note that the type of attention deployment studied was not emotional in nature and instead measured patients’ ability to perform an emotionally neutral listening task.

Baumeister, DeWall, Ciarocco, and Twenge (2005) found similar attention control deficits among individuals who underwent an experimental induction of social rejection. Undergraduates were provided with bogus questionnaire feedback concerning the future trajectory of their social lives and were told that they “are the type who will end up alone later in life. You may have friends and relationships now, but by mid-20s most of these will have drifted away. You may even marry or have several marriages, but these are likely to be short-lived and not continue into your 30s…” (Baumeister et al., 2005). Participants who underwent this social rejection induction displayed performance deficits in the dichotomous listening task and persisted for less time when asked to work on unsolvable puzzles. This suggests that experimentally induced loneliness may influence the ability to direct and sustain attention. Again, the outcome measure of attention deployment was not directly focused on the control of emotion but on performance in the neutral dichotomous listening task and persistence on a puzzle task.

Beyond deficits in the control of attention, Baumeister et al. (2005) found that the experimental induction of social rejection also disrupted the self-regulation of hedonic
consumption behaviors. When offered compensation proportionate to the amount of foul-tasting vinegar that participants could bear to drink, individuals in the previously described social rejection condition consumed significantly less vinegar than controls. While it is unclear whether the decreased consumption may also have been due to other differences in motivation or trust, Baumeister et al. (2005) further examined junk food consumption in response to the stress of social rejection. They conducted another social rejection induction that involved falsely informing participants that none of the other subjects who they been previously introduced to were interested in working with them. Individuals who underwent this induction consumed almost twice as many cookies as controls and rated these cookies as better tasting (Baumeister et al., 2005). Binge-eating is thought to function as a maladaptive emotion regulation strategy that facilitates the avoidance of aversive psychological experiences through distraction and the narrowing of attention towards other stimuli (Heatherton & Baumeister, 1991; Macht, Haput, & Ellgring, 2005). Although the measurement of binge-eating may be more directly related to emotion regulation processes relative to neutral listening tasks, it is constrained to a very specific maladaptive coping strategy.

Loneliness has also been associated with impaired self-regulation of emotion as reflected by a self-report scale of hedonic emotion regulation that was designed to capture the extent that people are able to repair negative mood, maintain positive mood by expressing their feelings, and intensify their feelings through behaviors such as listening to music (Hawkley, Thisted, & Cacioppo, 2009). The emotion regulation deficits associated with loneliness also influenced physical health behaviors. Employing a longitudinal design, loneliness predicted later decreases in physical activity, and self-reported emotion regulation deficits mediated this relationship (Hawkley et al., 2009). In other words, lonely individuals appeared to be less adept at regulating
their emotions and these regulation deficits predicted physical sedentariness. Hawkley et al. (2009) also tested social network size, frequency of contact with close ties, group membership and marital status as other potential mediators and all of these pathways were unsupported. Although this study suggests an important connection between loneliness and emotion-regulation it is limited by its reliance on a self-report measure of emotion-regulation. It is uncertain whether individuals are able to accurately assess their own experience and distinguish the generation of emotion from the regulation of emotion (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Robinson & Clore, 2002). Also these findings are constrained to effects of emotion regulation on physical activity. While there is some evidence to suggest a relationship between loneliness and emotion-regulation deficits, further research employing experimental measures of emotion regulation is necessary to address a significant gap in the existing bereavement literature.

Section 1.6: Grief and Loneliness

While loneliness displays far-reaching general health consequences, it is particularly relevant to experience of grief. Loneliness has long been intimately associated with the dysphoria experienced by individuals in the wake of bereavement. This intuitive connection is reflected by research that has consistently found elevated levels of loneliness experienced by bereaved individuals (Shuchter & Zissok, 1993; Horowitz et al., 1997). Some have even characterized elevated loneliness after loss as a good prognostic indicator of more severe or longer lasting grief reactions (Prigerson, 1995). While there is still a great deal of controversy concerning a formal complex/complicated grief diagnosis, there appears to be a general consensus that marked feelings of loneliness is a core feature of severe reactions to loss (Prigerson, 1995; Stroebe, Stroebe, Abakoumkin, & Schut, 1996).
Similar to the self-regulation problems associated with loneliness, maladaptive reactions after bereavement have also been linked to deficits in emotion-regulation (Gupta & Bonanno, 2011). The experience of bereavement is characterized by intense emotional reactions, and the ability to effectively regulate these emotions flexibly in response to a variety of contextual demands has been thought to be a fundamental process that protect against maladaptive responses to loss (Bonanno, 2009; Boanno, Goorin, & Coifman, 2008). In contrast to the assumption that the suppression of emotion is always maladaptive, Gupta & Bonanno (2011) found that when compared to bereaved individuals displaying complicated grief symptoms, the asymptomatic bereaved were better able to both suppress and express their emotional facial expression in reaction to sets of positive and negative images. This suggests that the ability to both up-regulate and down-regulate the expression of emotion are important to adaptive coping in grief. Further research is necessary to identify other factors that may be associated with the emotion regulation deficits in bereavement. The present study is the first to rely upon experimental measures of participants’ ability to suppress and express emotional facial expressions to explore deficits associated with loneliness in grief. This ability to regulate emotional expression has been associated with increased grief symptoms among bereaved individuals 1.5-3 years after a loss, a period when the vast majority of bereaved individuals have been found to resume normal functioning (Gupta & Bonanno, 2011; Bonanno, 2004; Bonanno & Kaltman, 2001).

While the literature examining the subject is incomplete, there is evidence to suggest that specific loneliness factors may be more influential to negative reactions during bereavement. As previously discussed, emotional loneliness (feelings of utter aloneness regardless of whether companionship was actually available) mediates depressive symptoms (Stroebe, Stroebe,
Abakoumkin, & Schut, 1996) and predict suicidal ideation in bereaved individual (Stroebe, Stroebe, & Abakoumkin, 2005), while social loneliness does not. Based on these findings, there is reason to expect that the emotional loneliness may also be associated with impairments in the ability to suppress and express emotions during bereavement. Also, while social loneliness may be associated with negative consequences, we do not believe that it will be more influential for bereaved individuals than for married controls.

To our knowledge, there are no published studies examining the experience of loneliness in bereavement that employ the more comprehensive loneliness subtypes validated through confirmatory factor analysis by Hawkley, Browne, & Cacioppo (2005). While prior research has looked at emotional loneliness and social loneliness, there is no existing literature on collective loneliness during bereavement. This dimension is particularly interesting in relation to grief because unlike social loneliness, collective isolation explores the experience of group identification that goes beyond relational social support. Investigating the effects associated with identifying with and internalizing aspects of a collective during grief may provide new insights into the potentially important role of perceived social connection with these groups.

While emotional loneliness in grief may be related to a sense of “utter aloneness” when one is separated from an important attachment, collective cultural connection could potentially buffer the effects of this loss. Related to “transitional objects” that provide comfort during separation by representing important connections to caregivers in early developmental periods, Winnicott (1971) describes general cultural experiences as “transitional phenomenon” that symbolizes union with others. Just as a child may derive meaning and comfort from a subjectively created “transitional object,” feeling connected to the powerful symbols of group identification may also provide individuals with psychological benefits during separation.
Identifying with collectives may also enhance an individual’s ability to rely on self-serving judgments that produce positive emotions and are understood to be adaptive in some situations (see Rouse & Olsen, 2007). These judgments can manifest in the form of in-group biases where group members are perceived as superior to non-members (Locksley, Ortiz, & Hepburn, 1980; Mullen, Brown, & Smith, 1992; Islam & Hewstone, 1993; Pettigrew, 1979). At the individual level, self-enhancing tendencies have been associated with healthy adaptation in grief (Bonanno, Field, Kovacevic, & Kaltman, 2002; Yan & Bonanno, 2015). Furthermore, the negative association between self-enhancing tendencies and symptoms appeared to be mediated by loneliness in bootstrapping path analyses (Yan & Bonanno, 2015). This suggests that self-enhancing individuals may feel less alone (regardless of objective social support) and experience fewer symptoms as a result. Identifying with collectives could potentially provide another avenue for individuals to employ self-serving biases at the group level that may be adaptive in grief.

Feeling connected to collective groups may also be beneficial by allowing individuals to employ cognitive reframing strategies. Cruwys, Dingle, Haslam, Haslam Jetten, and Morton (2013) found that the ability to avoid attributing negative events to internal, stable or global causes partially mediated the negative association found between social identification and depression. Social identity may provide a cognitive platform to control help control attention and shift away from individual depressive internal attributions towards broader collective frames (Cruwys et al., 2013; Cruwys, Haslam, Dingle, Haslam, & Jetten, 2014).

Although Stroebe, Stroebe, Abakoumkin, & Schut (1996) found that reductions in social loneliness did not appear to buffer against increases in depressive symptoms among individuals experiencing emotional loneliness during grief, they did not examine the experience of collective
loneliness. Feeling connected to a collective may provide a resource for bereaved individuals to regulate their emotions. We expect to find that bereavement may be an adverse experience that is specifically relevant to the potentially positive effects of collective identification. Unfortunately, an evaluation of the specific mechanisms that may account for this is beyond the scope of this study.
CHAPTER 2

The Current Investigation

Section 2.1: Overview

The role of loneliness during bereavement is of great interest because loneliness has been associated with self-regulation impairments while maladaptive responses to grief have also been associated with deficits in self-regulation of emotional expression. The current investigation will attempt to bridge these existing bodies of literature by examining a group of spousal bereaved individuals 1.5-3.0 years after a loss and comparing them to a demographically similar married control group. Previous studies have established that the majority of individuals will resume normal functioning one year after the loss (Bonanno, 2004; Bonanno & Kaltman, 2001), and we will examine individuals who continue to suffer the adverse experience of loneliness after this one-year period. Relying on cross-sectional data, we will investigate the relationship between loneliness, measured with a widely used self-report measure (UCLA-LON; Russell, Peplau, & Cutrona, 1980), and regulation of emotional expression. In contrast to previous research that relied on either self-report measures of emotion regulation or measures of specific coping strategies, we evaluate participants’ performance on an experimental emotional expression regulation task. This experimental task evaluates participants’ ability to both down-regulate (suppress) and up-regulate (enhance) facial expressions in response to positive and negative images, which has previously been found by Gupta & Bonanno (2011) to be associated with maladaptive responses to grief.

By comparing bereaved individuals with married controls, we intend to explore any moderating effects of the grief context on the relationship between loneliness and emotion regulation. Also, we will examine the three loneliness subtypes (emotional loneliness, social
loneliness and collective loneliness) in order to parse out the potentially different relationships each subtype may have with emotion regulation.

Section 2.2: Hypotheses

While we expect all three loneliness subtypes to be positively associated with bereavement status (see Table 1, $H_1$) and negatively associated with emotional expressive and suppressive ability (see Table 1, $H_2$), there may be some important differences among these dimensions. Based on prior research that found emotional loneliness to mediate future increases in depressive symptoms (Stroebe et al., 1996) and suicidal ideation (Stroebe et al., 2005) among bereaved individuals, there is some reason to believe that this aspect of loneliness may be particularly relevant to grief. Because of this, we expect to find the relationship between emotional loneliness and emotional expression regulation to be stronger in bereaved individuals than in married controls (see Table 1, $H_3$). Also, because social support was not found to mediate increases in depressive symptoms (Stroebe, Abakoumkin, & Schut, 1996) and suicidal ideation (Stroebe, Stroebe, Abakoumkin, 2005) among bereaved individuals, there is some evidence to suggest that social loneliness is not significantly more influential in the grief context. Thus, we expect to find that the relationship between social loneliness and emotional expression regulation performance to be no different in bereaved individuals when compared to married controls (see Table 1, $H_4$).

Collective identification may help serve the purpose of bringing individuals together in times of adversity (Cacioppo et al., 2015) and grief may represent a context of adversity that may be particularly relevant to collective group processes. Also, collective identity has been found to be negatively associated with depressive symptoms, and this may possibly be the result of collective frames providing a cognitive platform that enhances the regulatory ability of avoiding
depressive attributions (Cruwys et al., 2013). Based on these findings, we expect that the relationship between collective isolation and emotional expression regulation to be stronger in bereaved individuals than in married controls (see Table 1, $H_3$).

Furthermore, we control for other variables that may be relevant to loneliness. We assess relationship satisfaction through a self-reported dyadic adjustment measure and enter it into our analyses to control for the potential effects of perceived relationship quality on loneliness and emotion regulation. We also conduct structural clinical interviews in order to assess the number of depression and PTSD symptoms (quantified by the total number of symptoms). We enter the number of depression and PTSD symptoms as covariates in our analyses in order to account for the effects of these symptoms on loneliness and emotion regulation performance.

Section 2.3: Methods

Participants

The study included 80 conjugally bereaved individuals recruited through advertisements, referrals, and mailings and 62 married individuals from the New York metropolitan area recruited through mailings and Internet advertisements. Recently bereaved individuals were identified through obituary listings and were mailed information packets about the study. Also, advertisements were posted on the online classified advertisement website “Craigslist.” Inclusion criteria for the bereaved participants included recently experiencing the death of a spouse 1.5–3.0 years prior and an age below 65 years. Individuals with a yearly income of at least $15,000 were included in the study. Also, participants were asked over the phone if they had ever experienced chronic depression prior to the death event and those that endorsed this were excluded from the study. The sample (96 female, 46 male) ranged in age from 23 to 64 ($M = 49.35, SD = 9.11$) and was comprised of 34 African Americans, 5 Asian Americans, 12 Hispanics, 86 Caucasian and 5
individuals who endorsed an “other” ethnic category. Pearson Chi-square analysis revealed no significant differences between ethnicity between the bereaved and married groups. MANOVA’s revealed no significant differences between the bereaved and married groups in terms of age, years of education, length of marriage and family income. Participants signed consent forms approved by respective institutional review boards.

Section 2.4: Procedure

Participants were invited to the laboratory to undergo two interview sessions that were set approximately two weeks apart as a part of a broader bereavement study. Prior to arriving in the laboratory, participants were mailed questionnaire packets that they were asked to complete at home prior to the first interview session. In addition to a variety of measures administered as a part of the larger bereavement study, the questionnaire packets contained a self-reported loneliness measure (Revised UCLA Loneliness Scale, R-UCLA-LON; Russell, Peplau, & Cutrona, 1980) as well as a measure of relationship satisfaction (Dyadic Adjustment Scale, DAS-4; Sabourin, Valois, & Lussier, 2005). Participants were instructed to bring these completed questionnaires to the initial laboratory session.

During the first interview session participants were asked a series of questions regarding symptoms of Major Depressive Disorder and PTSD (DSM-IV-TR, American Psychological Association, 2000). This included information about frequency and duration of experiences in order to determine whether participants met criteria for each individual symptom. The total number of symptoms was used in our analyses as opposed to a binary variable indicating the presence or absence of Major Depression and PTSD diagnoses in order to capture greater variance in the experience of these symptoms.
At the conclusion of the first interview, participants were scheduled to return to the lab approximately two weeks later. During the second interview session, participants completed the expressive flexibility experimental task on a computer. Participants were asked to sit in front of a computer monitor where a video camera recorded their faces as they completed the task. Instructions that appeared on the computer monitor guided them through the task and a graduate level research assistant answered any questions during a practice phase. After research assistants assessed that the participants understood the task, participants completed experimental trials of the task. Patients were each compensated $200 for their participation in the larger study.

Section 2.5: Measures

Depression Symptoms. During the first interview session, all participants were questioned regarding symptoms of Major Depressive Disorder (MDD) by employing all items from the depression module of the Structured Clinical Interview for DSM-IV-TR (SCID-IV), while the module itself was not conducted. Symptom criteria specified frequency and intensity (e.g. “significant difficulties more days than not”). These structured interview questions assessed current symptoms over the past month. Individual raters, who were part of a team of clinical psychologists and advanced doctoral candidates in clinical psychology, conducted one-on-one interviews. Each rater integrated frequency and intensity criteria to determine if participants qualified for each individual symptom criteria. For example, if someone reported endorsed feeling “a lot less interested in most things or unable to enjoy the things [they] used to enjoy,” they would also need to feel this way “nearly every day for as long as two weeks” in order to reach criteria for this symptom. While items from the depression module of the Structured Clinical Interview for DSM-IV-TR (SCID-IV) were employed, the module itself was not administered to determine whether each participant met criteria for clinical depression. Instead,
each participant was questioned about every depression symptom to produce a total symptom count in order to capture greater variance as a continuous measure as opposed to a binary measure of presence or absence of clinical depression. Interrater reliability for the symptom items was very high (average $K = .91$). Symptom totals ranged from 0 to 8 ($M = 1.73$, $SD = 2.29$).

**PTSD Symptoms**: During the first interview session, all participants were questioned regarding symptoms of Post Traumatic Stress Disorder (PTSD) by employing items taken from the PTSD module of the Structured Clinical Interview for DSM-IV-TR (SCID-IV). Symptom criteria specified frequency (e.g. “was this for most of the time”) and intensity of current symptoms over the past month. Each rater integrated frequency and intensity criteria to determine if participants qualified for each individual symptom criteria. For example, if someone endorsed feeling “scared, angry or guilty” they would also need to feel this way “most of the time in the past month” in order to reach criteria for the symptom of pervasive negative emotional state. Individual raters, who were part of a team of clinical psychologists and advanced doctoral candidates in clinical psychology, conducted one-on-one interviews. Each rater determined if participants qualified for each individual symptom criteria. While items from the PTSD module of the Structured Clinical Interview for DSM-IV-TR (SCID-IV) were employed, the module itself was not administered to determine whether each participant met criteria for clinical depression. Instead, each participant was questioned about every PTSD symptom to produce a total symptom count in order to capture greater variance as a continuous measure as opposed to a binary measure of presence or absence of PTSD. Symptom totals ranged from 0 to 13 ($M = 2.68$, $SD = 3.15$).
Loneliness: Participants completed a series of questionnaire forms including the revised University of California Los Angeles Loneliness Scale (R-UCLA-LON; Russell, Peplau, & Cutrona, 1980), which was used to assess loneliness. Analyses by Russell et al. (1980) showed high reliability and supported discriminant validity against measures of personality, social desirability, and depression. The scale consists of 20 items (e.g. “I feel isolated from others,” and “there is no one I can turn to”), and participants were asked to rate how often they felt this way on a scale from 1 (“never”) to 4 (“often”). While there are no established cut off scores to define loneliness, the mean loneliness score of our sample ($M = 2.08, SD = 0.60$) was comparable to average levels found in undergraduates in North America ($M = 1.77$) and Puerto Rico ($M = 2.04$) (Jones, Carpenter, & Quintana, 1985). Reliability for the overall scale was excellent ($\alpha = .93$).

Hawkley, Browne and Cacioppo (2005) conducted a factor analysis of responses to the UCLA loneliness scale among a population based adult sample and uncovered three subscales of loneliness that were employed in the current study: Intimate Isolation, Relational Isolation, and Collective Isolation. Intimate Isolation was used to measure of emotional loneliness, Relational Isolation was used to measure social loneliness, and Collective Isolation was used to measure collective loneliness (Hawkley, Browne, & Cacioppo, 2005).

Emotional Loneliness: The Intimate Isolation subscale was used as to measure emotional loneliness and consisted of 11-items (e.g. “I feel alone,” “My social relationships are superficial”) on a scale from 1 (“never”) to 4 (“often”) and is thought to capture overall feelings of aloneness, rejection and withdrawal. This subscale is also thought to indicate social dissatisfaction at the individual level of analysis. Mean scores of Intimate Isolation (emotional loneliness)
loneliness) were calculated and employed in analyses (\(M = 2.16, SD = 0.67\)). Reliability for the subscale in the current study was good (\(\alpha = .90\)).

**Social Loneliness:** The Relational Isolation subscale was used to measure social loneliness and consisted of 5-items (e.g. “I can find companionship when I want it,” “There are people I can turn to”) on a scale from 1 (“never”) to 4 (“often”) and is thought to capture perceptions of intimacy, closeness and support from close friends and family. Mean scores of Relational Isolation were calculated and employed in analyses (\(M = 1.56, SD = 0.59\)). Reliability for the subscale in the current study was good (\(\alpha = .88\)).

**Collective Loneliness:** The Collective Isolation subscale was used to measure collective loneliness and consisted of 4-items (e.g. “I feel in tune with the people around me,” “I feel part of a group of friends”) on a scale from 1 (“never”) to 4 (“often”) and is thought to capture social dissatisfaction at a social-collective level of analysis (Hawkley, Browne, & Cacioppo, 2005). This subscale is thought to reflect group identification and cohesion. Mean scores of **Collective Isolation** were calculated and employed in analyses (\(M = 1.78, SD = 0.56\)). Reliability for the subscale in the current study was good (\(\alpha = .83\)).

**Dyadic Adjustment:** Participants completed an abbreviated 4-item version of the Dyadic Adjustment Scale (DAS-4; Sabourin, Valois, & Lussier, 2005) to assess dyadic adjustment (Spanier, 1976). The scale consists of 4-items (e.g. “How often did you discuss or consider divorce, separation, or terminating your relationship,” and “Please circle the number that best describes the degree of happiness you experienced in your relationship”), and participants were
asked to rate how often they felt this way on two scales from 1 (“All the time”) to 5 (“often”) and from 1 (“Very unhappy”) to 5 (“Very Happy”) that were selected from the “Dyadic Satisfaction” subscale of the DAS (Spanier, 1976). The DAS-4 is designed to be a measure of relationship satisfaction for married couples and similar dyads and has been demonstrated to have adequate convergent and divergent validity (Sabourin, Valois, & Lussier, 2005). It has also been found to predict future couple dissolution and structural equation modeling has demonstrated that the latent construct of relationship satisfaction remained stable over a two-year period (Sabourin, Valois, & Lussier, 2005). Mean DAS-4 scores were employed in analyses ($M = 3.9, SD = 0.85$). Reliability in the current study was good ($\alpha = .85$).

Expressive Flexibility Task: Participants were asked to complete the expressive flexibility task during their second interview session. Participants were asked to sit in front of a computer monitor where a video camera recorded their faces while they completed the task. Instructions that appeared on the computer monitor guided them through the task and a graduate level research assistant clarified questions during a practice phase. Participants were presented with sets of five images that were all selected from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 1995). Images were presented for seven seconds in duration with four-second intervals between images. During these initial practice trials, subjects were asked to view randomly presented blocks of positive or negative stimuli. After each block, subjects were asked to rate the extent to which they felt “negative emotion (e.g. anger, revulsion, sadness, distress)” by typing a number between 1 (“no negative emotion”) and 7 (“extreme negative emotion”). The subjects were also asked to rate the extent to which they felt “positive emotion
(e.g. happiness, joy amusement, interest,” by again typing a number between 1 (“no negative emotion”) and 7 (“extreme negative emotion”).

After practice trials, participants were told that there was another person in the adjacent room who would also take part in the experiment, although there was no other participant. The participant was told that they would not see this other person, but that that this person would sometimes be able to view the participant on a video monitor as they completed the task. Participants were also told that the computer would inform them as to whether the monitor was on and that the other person was able to see them or if the monitor was off and that the other person was unable to see them. The experimenter explained that the task of the person in the adjacent room would be to guess what the participant was feeling while viewing their image on a computer monitor. The participant was then told that computer would present one of three different instructions prior to each picture set. Sometimes, participants were instructed to enhance their expression of emotion in response to the images so that the observer in the adjacent room could easily guess what they are feeling. Participants were also sometimes instructed to suppress their expression of emotion in response in response to the images so that the observer in the adjacent room could not easily guess what they are feeling. Finally, the computer would sometimes inform the participant that the observer’s monitor was turned off and that the participant should continue to view the images and respond as they would normally. After a research assistant answered any questions and ensured that participants understood the task, the participants were presented with the three sets of instructions that would be presented to them prior to each image set. The three sets of instructions read as follows:

Expression Condition:

Shortly, you will be presented with a set of images. Please view each image carefully. While viewing the images, please do your best to EXPRESS AS FULLY AS POSSIBLE THE EMOTIONS you feel while viewing the images. Remember that the person viewing you on the
monitor can only see your head and neck, and cannot hear you. It is important for the sake of this study that you do your best to communicate what you are feeling. So please do the best you can to BEHAVE IN SUCH A WAY THAT THE PERSON VIEWING YOU ON A MONITOR WILL BE ABLE TO GUESS FROM YOUR FACIAL EXPRESSIONS what you are feeling while viewing the images. Before each image, focus your attention on the ‘X’ in the middle of the screen. After viewing each set of images, you will be asked to rate the emotional reactions you had to the images.

Suppression Condition:
Shortly, you will be presented with a set of images. Please view each image carefully. While viewing the images, please do your best to SUPPRESS AS FULLY AS POSSIBLE THE EMOTIONS you feel while viewing the images. Remember that the person viewing you on the monitor can only see your head and neck, and cannot hear you. It is important for the sake of this study that you do your best to conceal what you are feeling. So please do the best you can to BEHAVE IN SUCH A WAY THAT THE PERSON VIEWING YOU ON A MONITOR WILL NOT BE ABLE TO GUESS FROM YOUR FACIAL EXPRESSIONS what you are feeling while viewing the images. Before each image, focus your attention on the ‘X’ in the middle of the screen. After viewing each set of images, you will be asked to rate the emotional reactions you had to the images.

Monitor-off Condition:
Shortly, you will be presented with a set of images. Please view each image carefully. NO ONE WILL BE VIEWING YOU FOR THIS SET OF IMAGES. Simply view the images and behave as you would naturally do so. Before each image, focus your attention on the ‘X’ in the middle of the screen. After viewing each set of images, you will be asked to rate the emotional reaction you had to the images.

After all of the instructions were presented to the participant, a research assistant clarified any remaining questions. After the participant understood the task, they were presented with six blocks of experimental trials. Each of these trials began with one of the three sets of instructions (Suppress, Express, Monitor off) followed by a block of five images (positive or negative). Finally, after viewing the image block, participants were asked to rate to what extent they felt “negative emotion” and “positive emotion by selecting a number between 1 and 7.” The order in which instruction condition (Suppress, Express, Monitor off) and image set valence (positive, negative) were presented were both randomized. Sets of images were balanced based on previously established IAPS norms so that each of the sets was equally as negative or positive as the other sets of the same valence.
32 graduate psychology students, who were blind to the conditions, coded recordings of the participants. They employed the same 7-point scales to rate to what extent they felt that the participant was expressing positive or negative emotion. Each participant was independently rated by three graduate students who had no knowledge of any of the instructions presented to participants and viewed each video recording without accompanying sound. Observer agreement was high (ICC, two-way random, consistency type = .89) and did not differ significantly by expression condition or stimulus valence. Overall observer-rated expression scores were obtained by calculating the average across all three ratings.

Following previous studies (Bonanno et al. 2004; Westphal, Sivert, & Bonanno, 2010, Gupta & Bonanno, 2011), we calculated separate variables for expressive enhancement ability and expressive suppression ability. Enhancement ability was derived by calculating the difference between each participant’s baseline expression rating (average observer rating during the monitor off condition) and their enhancement expression (average observer rating during the expression condition). Likewise, we derived suppressive ability by calculating the difference between each participant’s baseline expression rating (average observer rating during the monitor off condition) and their suppression expression (average observer rating during the suppression condition). Furthermore, overall flexibility scores were calculated by taking the sum of expressive ability and suppressive ability and subtracting it from the absolute value of the difference between expressive ability and suppressive ability.

Section 2.6: Results

Correlation and multiple regression analyses were conducted to examine the relationships between loneliness and various predictors. Predictor variables in the regression analyses were mean centered in attempt to attenuate issues of multicollinearity. Table 1 summarizes the
descriptive statistics of the variables explored as well as the zero-order correlations between these variables. *Social Loneliness* was negatively and significantly correlated with expressive ability, \( r(140) = -0.17, n = 142, p < 0.05 \). While not significant, the remaining loneliness factors were negatively correlated with expressive and suppressive ability. All three loneliness subscales were significantly and positively correlated with depression symptoms: *Emotional Loneliness*, \( r(140) = 0.42, n = 142, p < 0.01 \); *Social Loneliness*, \( r(140) = 0.33, n = 142, p < 0.01 \); *Collective Loneliness*, \( r(140) = 0.39, n = 142, p < 0.01 \). Dyadic adjustment was negatively and significantly correlated with *Emotional Loneliness*, \( r(140) = -0.22, n = 142, p < 0.01 \). Finally, expressive ability was negatively and significantly correlated with suppressive ability, \( r(140) = -0.38, n = 142, p < 0.01 \).

**Regression Analyses**

**Emotional Loneliness**

We first regressed *Emotional Loneliness* on bereavement status, and the model was significant and produced, \( R^2 = 0.091, F(1, 140) = 14.07, p < .001 \). Bereavement status was significantly and positively associated with *Emotional Loneliness*, \( \beta = 0.30, p < .001 \). We then entered expressive and suppressive ability to the model, which was significant and produced, \( R^2 = 0.10, F(3, 138) = 4.91, p < .01 \). Both expressive ability and suppressive ability were not significantly associated with *Emotional Loneliness*, while bereavement status continued to be significantly and positively associated with *Emotional Loneliness* (see Table 3, *Model 1*). We then included two interaction terms into the model: Suppressive Ability X Bereavement Status and Expressive Ability X Bereavement Status. This model was significant and produced, \( R^2 = 0.12, F(5, 136) = 3.71, p < .01 \). Bereavement status continued to be significantly and positively associated with *Emotional Loneliness*, \( \beta = 0.30, p < .001 \). The Expressive Ability X
Bereavement Status interaction was marginally significant at predicting Emotional Loneliness ($p = .063$) (see Table 2, Model 2). The Suppressive Ability X Bereavement Status interaction did not significantly predict Emotional Loneliness.

**Social Loneliness**

We then regressed Social Loneliness on bereavement status, which was significant and produced, $R^2 = .033$, $F(1, 140) = 5.80$, $p < .05$. Bereavement status significantly and positively predicted Social Loneliness, $\beta = 0.20$, $p < .005$. We then entered expression and suppression ability to the model, which was significant and produced, $R^2 = .090$, $F(3, 138) = 4.57$, $p < .01$. After including expressive and suppressive ability, bereavement status continued to be significantly associated with Social Loneliness (see Table 3, Model 1). Expressive ability was significantly and negatively associated with Social Loneliness, $\beta = -.23$, $p < .01$, while suppressive ability displayed a significant trend in association with Social Loneliness, $\beta = -.16$, $p = .079$ (see Table 3, Model 1). We then entered the two interaction terms: Suppressive Ability X Bereavement Status and Expressive Ability X Bereavement Status, which produced, $R^2 = .11$, $F(5, 136) = 3.38$, $p < .01$, but neither interaction term was found to be significantly associated with Social Loneliness (see Table 3, Model 2).

**Collective Loneliness**

We then regressed Collective Loneliness on bereavement status, which was significant and produced, $R^2 = .06$, $F(1, 140) = 8.97$, $p < .01$. Bereavement status significantly and positively associated with Collective Loneliness, $\beta = 0.25$, $p < .01$. We then entered expressive ability and suppressive ability to the model, which was significant and produced, $R^2 = .064$, $F(3, 138) = 3.16$, $p < .05$. In this model, bereavement status was significantly and positively associated with Collective Loneliness, while expressive and suppressive ability were both not
significantly associated (see Table 4, Model 1). We then included two interaction terms to the model: Expressive Ability X Bereavement Status and Suppressive Ability X Bereavement. The overall model was significant and produced $R^2 = .12, F(5, 136) = 3.54, p < .01$. Bereavement status continued to display a significant and positive relationship with Collective Loneliness, while expressive and suppressive ability variables did not display any significant main effects (see Table 4, Model 2). Most interestingly, both interaction terms (Expressive Ability X Bereavement Status, $\beta = -0.32, p < .05$; and Suppressive Ability X Bereavement, $\beta = -0.29, p < .05$) were significantly associated with Collective Loneliness (see Table 4, Model 2).

**Regression Analyses with Covariates**

We then repeated these analyses after controlling for depression symptoms, PTSD symptoms and dyadic adjustment in order account for the effects of symptomology and relationship quality. We sought to explore whether the relationship between emotional regulation and loneliness subscales persisted when controlling for these factors.

**Emotional Loneliness**

We regressed Emotional Loneliness on bereavement status, dyadic adjustment, depression and PTSD, which was significant and produced, $R^2 = .29, F(4, 137) = 14.01, p < .001$. Both bereavement status, $\beta = 0.18, p < .05$, and depression, $\beta = 0.26, p < .01$, were significantly and positively associated with Emotional Loneliness, while dyadic adjustment was significantly and negatively associated, $\beta = -.28, p < .001$. PTSD as not significantly associated with Emotional Loneliness (see Table 3, Model 3).

We then entered expressive and suppressive ability to the model, which produced, $R^2 = .26, F(6, 135) = 9.43, p < .001$. While bereavement status, dyadic adjustment and depression all maintained their significant relationships with Emotional Loneliness, both expressive ability and
suppressive ability were not significantly associated with Emotional Loneliness (see Table 3, Model 3). We then included two interaction terms into the model: Suppressive Ability X Bereavement Status and Expressive Ability X Bereavement Status. This model was significant and produced, $R^2 = .27, F(8, 133) = 7.50, p < .001$. Again, the Suppressive Ability X Bereavement Status interaction term was not significantly association with Emotional Loneliness (see Table 3, Model 4). In contrast to the prior analysis that had not controlled for dyadic adjustment, depression and PTSD symptoms, the Expressive Ability X Bereavement status interaction term did not display a significant trend in association with Emotional Loneliness (see Table 3, Model 4).

**Social Loneliness**

We then regressed Social Loneliness on bereavement status, dyadic adjustment, depression and PTSD symptoms which was significant and produced, $R^2 = .14, F(4, 137) = 5.68, p < .001$. Depression was significantly and positively associated with Social Loneliness, $\beta = .27, p < .01$, while dyadic adjustment was significantly and negatively associated, $\beta = -.16, p < .05$). PTSD did not display a significant association with Social Loneliness. In contrast to the prior model, bereavement was no longer significantly predictive of Social Loneliness after the inclusion of covariates, $\beta = .12, p = .16$.

We then included both expressive ability and suppressive ability into the model, which was significant and produced, $R^2 = .18, F(6, 135) = 5.04, p < .001$. Even after controlling for depression, PTSD and dyadic adjustment, expressive ability significantly and negatively predicted Social Loneliness, $\beta = -.21, p > .05$) while suppressive ability displayed a marginal main effect ($\beta = -.16, p = .069$) that was negatively associated with Social Loneliness. Both depression and dyadic adjustment maintained their significant relationship with Social
Loneliness, while bereavement was not found to be significantly associated (see Table 3, Model 3). We then included into the model the two interaction terms: Suppressive Ability X Bereavement Status and Expressive Ability X Bereavement Status, which produced, $R^2 = .20$, $F(8, 133) = 4.12, p < .001$, but found no significant interaction effects.

Collective Loneliness

We then regressed Collective Loneliness on bereavement status, dyadic adjustment, and depression, which was significant and produced, $R^2 = .20, F(4, 137) = 8.59, p < .001$. Depression displayed a significant association with Collective Loneliness, $\beta = .26, p < .01$, while dyadic adjustment displayed a positive trend, $\beta = -.15, p = .063$. PTSD did not display a significant relationship with Collective Loneliness. In contrast to the prior model that did not include covariates, bereavement was no longer significantly predictive of Collective Loneliness, $\beta = .13, p = .13$.

We then entered expressive ability and suppressive ability to the model, which was significant and produced, $R^2 = .20, F(6, 135) = 5.71, p < .001$. Depression maintained a significant positive relationship with Collective Loneliness while bereavement status, expressive ability, and suppressive ability were not significantly associated (see Table 4, Model 3). We then entered the two interaction terms into the model (Expressive Ability X Bereavement Status and Suppressive Ability X Bereavement Status), which was significant and produced $R^2 = .24, F(8, 133) = 5.33, p < .001$. Most interestingly, both interaction terms (Expressive Ability X Bereavement Status, $\beta = -.27, p < .05$, and Suppressive Ability X Bereavement, $\beta = -.29, p < .05$) were significantly negatively associated with Collective Loneliness even after controlling for bereavement status, dyadic adjustment and depression (see Table 4, Model 4). This suggest that the bereavement context moderates the relationships between suppressive ability and Collective
Loneliness (see Graph 1), as well as the relationship between expressive ability and Collective Loneliness (see Graph 2). Depression continued to display a significant and positive relationship with Collective Loneliness, while dyadic adjustment displayed a significant and negative relationship (see Table 4, Model 4).

Expressive Flexibility and Collective Loneliness

Because both expressive and suppressive ability displayed significant interaction effects with bereavement status, we repeated our analysis after replacing expressive and suppressive ability with an overall flexibility score, which was calculated by taking the sum of expressive ability and suppressive ability and subtracting it from the absolute value of the difference between expressive ability and suppressive ability.

We removed expressive and suppressive ability from the model and replaced it with this overall flexibility score. Collective Loneliness was regressed on bereavement status, dyadic adjustment, depression, flexibility and the interaction term Flexibility x Bereavement, which was significant and produced, $R^2 = .23, F(6, 135) = 6.55, p < .01$. Depression continued to display a significant and positive relationship with Collective Loneliness, while dyadic adjustment and flexibility did not (see Table 4, Model 5). Flexibility x Bereavement significantly predicted Collective Loneliness, $\beta = -.21, p < .05$ (see Table 4, Model 5). The experience of bereavement appeared to moderate the relationship between expressive flexibility and Collective Loneliness (see Graph 3).
CHAPTER 3

Discussion

Our study sought to explore the experience of loneliness after bereavement. We relied on cross-sectional data to examine three subscales of loneliness among bereaved participants and married controls. Compared to married controls, bereaved individuals displayed higher levels of all three dimensions of loneliness: emotional loneliness, social loneliness and collective loneliness. While the three subscales were highly correlated with one another, we found some important differences in each dimension. For example, social loneliness was no longer significantly associated with bereavement when accounting for the influence of relationship satisfaction, PTSD and depression symptoms. This suggests that emotional loneliness and collective loneliness are more intimately associated with grief. Also, we found that grief moderated the association between collective loneliness and the ability to regulate emotional expressions. These moderation effects persisted even when accounting for the influence of relationship satisfaction, PTSD and depression symptoms.

Section 3.1: Limitations

Before discussing our findings further, it is necessary to acknowledge that due to our reliance on cross-sectional data, we are unable to speculate about the causal relationships between bereavement, loneliness and emotion regulation. For example, we are unable to capture any change in loneliness scores over time that may have occurred in response to a grief event and we are unable to distinguish these effects from those that could potentially have been caused by pre-existing levels of loneliness. Nevertheless, we can begin to qualify the kinds of loneliness that are not only associated with bereavement, but that also continue to display this association.
when controlling for the effects of relationship quality as well as the number of depression and PTSD symptoms. By employing structured clinical interviews administered by trained interviewers, we were able to assess the number of symptoms experienced by participants in a manner that is far more stringent than measures that simply rely on self-report scales. While it is impossible for us to infer any causality in our results, we have still been able to capture important differences in the relationship between loneliness and emotion regulation that appear to be moderated by bereavement.

We also explored the relationship between the three loneliness dimensions and emotion regulation by relying upon a novel experimental task, which provided another methodological strength to our study. While prior research have assessed the emotion regulation through self-reported emotion regulation (Hawkley, et al., 2009), hedonic consumption behaviors (Baumeister et al., 2005) and the ability focus attention on neutral stimuli (Cacioppo et al., 2000), we were able to employ an experimental task that measured the ability to regulate emotional expressions. This allowed us to use a within-subjects design to assess participants’ ability to express and suppress their emotions in comparison to their own baseline and provided a more precise measure of a specific emotional regulation task than previous studies. Furthermore, performance on this task has also been negatively associated with maladaptive coping in bereavement (Gupta & Bonanno, 2011), which adds further clinical relevance to our findings. While the use of this task has provided us with a greater level of control in assessing the ability to suppress and enhance emotional expression in response to computer images, it is worth acknowledging that this came at some expense to naturalism. We were unable to capture emotion regulation strategies in response to real life situations outside of laboratory settings.
Also, a number different regulatory strategies or abilities could influence performance on our experimental task it is unclear which specific processes were employed to regulate emotional expression in our study. For example, one individual may effectively focus attention away from negative features of an emotional image, while another individual may make up a story to reframe an image to regulate the emotional impact. While prior research examined specific deficits in visual attention bias with an eye-tracker (Bangee et al., 2014), we examined performance on a task that could be influenced by a wider variety of regulatory abilities. Further investigation is necessary to understand these specific components and how they may be influential to experiences of loneliness in grief.

**Section 3.2: Review of the Observed Results**

After controlling for the number of depression symptoms, PTSD symptoms and self-reported relationship satisfaction, only *emotional loneliness* continued to display a significant relationship with bereavement status while both *social loneliness* and *collective loneliness* did not. This extends findings by Stroebe et al. (1996) that bereaved individuals display heightened *emotional loneliness* while experiencing similar levels of *social loneliness* in comparison to married controls. While *collective loneliness* did not show a significant relationship with bereavement when including symptom level and relationship satisfaction as covariates, there may be a more complicated underlying relationship suggested by the significant interaction effects between emotional expressive/suppressive ability and bereavement.

Contrary to our expectations, *emotional loneliness* was not negatively associated with expressive ability/suppressive ability (See Table 1, $H_2$). We did find a significant trend in the interaction term Expressive Ability X Bereavement ability associated with *emotional loneliness*, but this did not persist when controlling for depression and dyadic adjustment. Thus we failed to
find evidence that the relationship between *emotional loneliness* and emotional expression regulation was significantly moderated by bereavement status (See Table 1, *H*₃). While previous studies have found *emotional loneliness* to mediate grief related increases in depression and suicidal ideation, we were unable to find evidence that it was associated with emotional expression regulation in bereavement. Further research is necessary before any conclusions can be made about the relationship between *emotional loneliness* and emotion regulation. As previously discussed, our study was unable to capture any change in loneliness scores across time, the assessment of which could potentially help eliminate error that may have been introduced by our use of cross-sectional loneliness measures.

We found significant main effects of expressive ability that were negatively associated with *social loneliness*. This relationship persisted even after controlling for the effects of depression symptoms, PTSD symptoms and relationship quality. We also found a significant trend (*p* = .079) of suppressive ability negatively associated with *social loneliness*, which persisted (*p* = .069) after controlling for symptoms and relationship quality. Additionally, in line with our expectations (see Table 1, *H*₄) we did not find any significant interaction effects between expressive or suppressive ability and bereavement in predicting *social loneliness*. This suggests that the emotional expression regulation deficits associated with *social loneliness* are not significantly moderated by whether individuals have experienced a recent loss. The ability to suppress and express emotional facial expression may have implications for social interactions regardless of whether an individual is recently bereaved. Further research is necessary to uncover more information about this relationship.

While social loneliness appears to display a relationship with expressive and suppressive ability, it is again important to acknowledge the impossibility of inferring any causal
relationships because of the limitations of our cross-sectional design. It may be possible that individuals who are poor at enhancing their emotional expressions may have poorer social relations that influence feelings of isolation or that perhaps impoverished social connections influence the ability to enhance emotional expression that further feeds into actual and perceived isolation. Keltner & Kring (1998) review some of the social functions of emotion and how they may influence the social and emotional problems associated with several psychiatric disorders in a cyclically reciprocal manner. Likewise, the relationship between social loneliness and expressive enhancement ability may have reciprocal consequences with social interactions and further research is needed to explore this possibility. Regardless, our findings may provide some preliminary evidence that the context of grief does not moderate the relationship between emotion regulation and social loneliness.

Finally, our analyses uncovered some very interesting findings regarding collective loneliness in grief. While we did not find any significant main effects of expressive or suppressive ability on collective loneliness, we found significant interaction effects of both expressive and suppressive ability with bereavement status. Specifically, bereaved individuals experiencing collective loneliness displayed significantly stronger negative relationships with expressive and suppressive ability when compared to married controls experiencing collective loneliness (See Graph 1 and Graph 2). This suggests that the context of grief moderates the relationship between collective loneliness and emotion regulation. Previous research has found that bereaved individuals who demonstrated these same deficits in emotional expression regulation experienced a greater number of symptoms associated with complicated grief (Gupta & Bonanno, 2011).
What our findings suggest is that bereavement is a context that appears to hold specific relevance to emotion regulation ability and its association with collective loneliness (see Table 1, H3). Losing a spouse may be an adverse context where the ability to feel connected to collective groups has stronger associations with to the ability to regulate emotional expression. Future research is necessary to elaborate on this relationship by assessing prospective data that assesses baselines levels of collective loneliness prior to a loss in order to capture changes in this factor that may occur after a loss and how it may influence emotion regulation ability.

Our findings regarding collective loneliness provide some further insight onto prior research that revealed shortcomings in the influence of social support to buffer against aversive outcomes after bereavement. While support from face-to-face social interactions may not impact emotion regulation functioning in bereavement, perceived connection to collective groups could potentially be more important and provides a new avenue for evaluating clinically relevant social support. Our findings suggest that the collective social support may be a significant aspect of social connection that must be more fully explored with longitudinal data.

Also, while there is a paucity of empirical research on this dimension, the idea that social collective perspectives are highly relevant to grief is not a new. Neimeyer et al. (2002) discuss the importance of viewing the experience of loss through a multifaceted matrix of meaning that must include social constructions and ritualized mourning at a group level.

Section 3.3: Future Directions

While it is interesting to imagine that feeling a connection to collective groups may actually buffer against impairments of emotion regulation, this is beyond the scope of the present cross-sectional study. It may very well be possible that causality flows in the opposite direction and that emotion regulation deficits cause an individual to isolate away from group affiliations.
and produce greater feelings of collective loneliness. While our findings suggest some sort or significant relationship, prospective studies are necessary to answer questions regarding the nature of this association.

Also, while we accounted for depression and PTSD, there may still be distinct grief symptoms that influence both collective loneliness and emotional facial expression regulation. Given the fact that loneliness is an essential feature of grief, collective loneliness and severe grief reactions may be a tautology as opposed to two distinct elements. Further investigation is necessary to understand the role of loneliness and maladaptive responses to grief.

Also, little is known about the actual mechanisms that could account for the relationship between collective loneliness and emotion regulation. Our findings concerning collective loneliness among bereaved individuals may have been influenced by that extent that these individuals have felt connected to social mourning practices and other meaning-making structures for collectively understanding a loss. Based on our data, it is unknown whether the feelings of connection experienced by our participants was towards collective groups that were directly related to grief, i.e. a religious affiliation or grief support network that may provide some meaning structure to understand loss. It is also possible that these individuals may have felt connected to groups that offered no direct connection to grief. Future studies are necessary to answer this question.

Several potential mechanisms could account for adaptive benefits associated with identifying with collective groups. Among non-bereaved individuals, collective social identity has been found to buffer against depression symptoms by providing a cognitive platform to reduce the tendency to attribute negative events to internal, stable or global causes (Cruwys et al., 2013, Cruwys et al., 2014). An interesting question for future research to explore may be
whether feeling connected to collective groups in grief also provides some adaptive cognitive frame that accounts for positive outcomes.

Self-enhancing beliefs are also associated with fewer symptoms among bereaved individuals that appear to be mediated by decreases in self-reported loneliness (Yan & Bonanno, 2015). Perhaps self-serving judgments that manifest in the group level as in-group biases (Locksley et al., 1980; Mullen et al., 1992; Islam & Hewstone, 1993; Pettigrew, 1979) might also produce positive emotions relevant to adaptive coping in grief. While these questions are beyond the scope of the present study, our findings warrant further investigation into the potentially important role of collective group identification to adaptive coping in response to loss.
CONCLUSION

Our study examined dimensions of perceived isolation in relation to regulatory deficits in bereavement. While previous attention has focused on the “utter aloneness” of emotional loneliness (Stroebe, et al., 1996), our findings are the first to suggest that collective loneliness displays a unique relationship with emotion regulation in the context of grief. While we were unable to determine the nature of this relationship, we have been able to expand the literature regarding loneliness and self-regulatory deficits to the specific emotional expression deficits associated with maladaptive responses to grief. Our findings also provide some insight into the potentially important role of collective identity in grief. The inclination to view ourselves as not only autonomous individuals, but also as elements of a larger collective may be particularly influential during bereavement. While further research must uncover many of the questions that remain, our research strongly suggests that an entire category of perceived social connection has been overlooked in the bereavement literature.
References


Bryant, R. A. (2013). Is pathological grief lasting more than 12 months grief or depression? Current opinion in psychiatry, 26(1), 41-46.


Cacioppo, J.T., Ernst, J.M., Burleson, M.H., McClintock, M.K., Malarkey, W.B., Hawkley, L.C., Kowalewski, R.B. et al. (2000). Lonely traits and concomitant physiological processes:


reduce depression symptoms in community and clinical settings. *Journal of Affective Disorders*, 159, 139–146. doi: 10.1016/j.jad.2014.02.019


Herlitz, J., Wiklund, I., Caidahl, K., Hartford, M., Haglid, M., Karlsson, B. W., et al. (1998). The feeling of loneliness prior to coronary artery bypass grafting might be a predictor of


Table 1
Hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_1$</td>
<td>Bereavement will be positively associated with <em>Emotional Loneliness</em>, <em>Social Loneliness</em>, and <em>Collective Loneliness</em>.</td>
</tr>
<tr>
<td>$H_2$</td>
<td>Expressive Ability/Suppressive Ability will be negatively associated with <em>Emotional Loneliness</em>, <em>Social Loneliness</em>, and <em>Collective Loneliness</em>.</td>
</tr>
<tr>
<td>$H_3$</td>
<td>The <em>Emotional Loneliness</em>-Expressive Ability/Suppressive Ability association will be stronger in bereaved individuals than in married controls.</td>
</tr>
<tr>
<td>$H_4$</td>
<td>The <em>Social Loneliness</em>-Expressive Ability/Suppressive Ability association will not be different in bereaved individuals than in married controls.</td>
</tr>
<tr>
<td>$H_5$</td>
<td>The <em>Collective Loneliness</em>-Expressive Ability/Suppressive Ability association will be stronger in bereaved individuals than in married controls.</td>
</tr>
</tbody>
</table>
Table 2
Zero-order correlations \((N = 142)\)

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
<th>Emotional Loneliness</th>
<th>Social Loneliness</th>
<th>Collective Loneliness</th>
<th>Expressive Ability</th>
<th>Suppressive Ability</th>
<th>Flexibility</th>
<th>Dyadic Adjustment</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Loneliness</td>
<td>2.16 (0.67)</td>
<td>.57 (^{a,b})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Loneliness</td>
<td>1.56 (0.59)</td>
<td>.69 (^{a,b})</td>
<td>.68 (^{a,b})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collective Loneliness</td>
<td>1.78 (0.56)</td>
<td>.69 (^{a,b})</td>
<td>.68 (^{a,b})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expressive Ability</td>
<td>1.07 (1.03)</td>
<td>-.02</td>
<td>-.17 (^{b})</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppressive Ability</td>
<td>1.24 (1.04)</td>
<td>-.10</td>
<td>-.10</td>
<td>-.07</td>
<td>-.38 (^{a,b})</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>0.90 (1.58)</td>
<td>-.05</td>
<td>-.18 (^{b})</td>
<td>-.01</td>
<td>.50 (^{a,b})</td>
<td>.29 (^{a,b})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyadic Adjustment</td>
<td>3.87 (0.85)</td>
<td>-.22 (^{a,b})</td>
<td>-.14</td>
<td>-.10</td>
<td>.01</td>
<td>-.10</td>
<td>-.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>1.73 (2.29)</td>
<td>.42 (^{a,b})</td>
<td>.33 (^{a,b})</td>
<td>.39 (^{a,b})</td>
<td>-.10</td>
<td>-.07</td>
<td>-.06</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>PTSD</td>
<td>2.68 (3.16)</td>
<td>.36 (^{a,b})</td>
<td>.23 (^{a,b})</td>
<td>.34 (^{a,b})</td>
<td>-.05</td>
<td>-.07</td>
<td>.01</td>
<td>.17 (^{a})</td>
<td>.66 (^{a,b})</td>
</tr>
</tbody>
</table>

*\(^p \leq .05\)  **\(^p \leq .01\)  \(^{a}\)Mean Emotional Loneliness  \(^{b}\)Mean Social Loneliness  \(^{c}\)Mean Collective Loneliness  \(^{d}\)Mean Dyadic Adjustment
Table 3
Summary of Regression Analysis for Variables Predicting Emotional Loneliness (N = 142)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
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<tr>
<td></td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>β</td>
</tr>
<tr>
<td>Bereavement Status</td>
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<td>.30**</td>
<td>.18*</td>
<td>.19*</td>
</tr>
<tr>
<td>Dyadic Adjustment</td>
<td></td>
<td>- .28**</td>
<td>- .28**</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>.26**</td>
<td>.25*</td>
<td></td>
</tr>
<tr>
<td>PTSD</td>
<td></td>
<td>.17</td>
<td>.17</td>
<td></td>
</tr>
<tr>
<td>Expressive Ability</td>
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<td>.13</td>
<td>- .02</td>
<td>.12</td>
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<tr>
<td>Suppressive Ability</td>
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<td>.07</td>
<td>- .08</td>
<td>.07</td>
</tr>
<tr>
<td>ExpressiveAbility_X_Bereavement</td>
<td></td>
<td>- .23 †</td>
<td></td>
<td>- .17</td>
</tr>
<tr>
<td>SuppressiveAbility_X_Bereavement</td>
<td></td>
<td>- .15</td>
<td></td>
<td>- .16</td>
</tr>
</tbody>
</table>

| Adjusted R Square            | .08      | .09      | .26      | .27      |
| R Square Change              | .005     | .02      | .005     | .014     |
| F                            | 4.91**   | 3.74**   | 9.43**   | 7.46**   |
| F Change                     | .40      | 1.81     | .49**    | 1.38     |
| Total df (residual df)       | 141 (138)| 141 (136)| 141 (135)| 141 (133)|

* p ≤ .05 ** p ≤ .01 † p = .063
Table 4
Summary of Regression Analysis for Variables Predicting Social Loneliness (N = 142)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$\beta$</td>
<td>$\beta$</td>
<td>$\beta$</td>
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<tr>
<td>Bereavement Status</td>
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<td>.19*</td>
<td>.11</td>
<td>.12</td>
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<tr>
<td>Dyadic Adjustment</td>
<td></td>
<td>-.17*</td>
<td>-.17*</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>.24**</td>
<td>.24*</td>
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<td>.04</td>
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<td>-.21*</td>
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</tr>
<tr>
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<td>.01</td>
<td>-.16†</td>
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<td>-.16</td>
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<td></td>
<td>-.18</td>
<td></td>
<td>-.19</td>
</tr>
</tbody>
</table>

| Adjusted R Square | .07 | .08 | .15 | .15 |
| R Square Change   | .05 | .02 | .04 | .02 |
| $F$               | 4.57** | 3.38** | 5.04** | 4.12** |
| $F$ Change        | 3.84** | 1.56 | 3.37 | 1.28 |
| Total df (residual df) | 141 (138) | 141 (136) | 141 (135) | 141 (133) |

* $p \leq .05$  ** $p \leq .01$  $\gamma p = .079$  $\dagger p = .069$
Table 5
Summary of Regression Analysis for Variables Predicting Collective Loneliness (N = 142)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
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</thead>
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<tr>
<td>Bereavement Status</td>
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<td>.25*</td>
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<td>.14</td>
<td>.12</td>
</tr>
<tr>
<td>Dyadic Adjustment</td>
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<td>- .15¥</td>
<td>- .18</td>
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<td></td>
</tr>
<tr>
<td>Depression</td>
<td>.26*</td>
<td>.24*</td>
<td>.24*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSD</td>
<td>.15</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expressive Ability</td>
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<td>- .02</td>
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<td>Suppressive Ability</td>
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<td>.21</td>
<td>- .05</td>
<td>.21</td>
<td></td>
</tr>
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<td>Flexibility</td>
<td>.16</td>
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<td>- .27*</td>
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<td>- .29*</td>
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</tr>
<tr>
<td>Flexibility_X_Bereavement</td>
<td></td>
<td></td>
<td></td>
<td>- .21*</td>
<td></td>
</tr>
<tr>
<td>Adjusted R Square</td>
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<td>.083</td>
<td>.17</td>
<td>.20</td>
<td>.19</td>
</tr>
<tr>
<td>R Square Change</td>
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<td>.05</td>
<td>.002</td>
<td>.04</td>
<td>.03</td>
</tr>
<tr>
<td>$F$</td>
<td>3.16*</td>
<td>3.54**</td>
<td>5.71**</td>
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<td>6.55**</td>
</tr>
<tr>
<td>$F$ Change</td>
<td>0.29</td>
<td>3.91*</td>
<td>0.16</td>
<td>3.54*</td>
<td>4.28*</td>
</tr>
<tr>
<td>Total df (residual df)</td>
<td>141(138)</td>
<td>141(136)</td>
<td>141(135)</td>
<td>141(133)</td>
<td>141(135)</td>
</tr>
</tbody>
</table>

* $p \leq .05$ ** $p \leq .01$ † $p = .058$ ¥ $p = .057$
Graph 1
Interaction Effects between Suppressive Ability and Bereavement Status in association with Collective Loneliness
Graph 2
Interaction Effects between Expressive Ability and Bereavement Status in association with Collective Loneliness
Graph 3
Interaction Effects between Flexibility and Bereavement Status in association with Collective Loneliness