

Three-Paper Dissertation Titled:

Hope and Positive Emotions in Bereavement Among Older Adults in the United States

Soyeon Kim

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ABSTRACT

Hope and Positive Emotions in Bereavement Among Older Adults in the United States

Soyeon Kim

This three-paper dissertation aims to enhance our understanding of the role of positive psychology constructs, hope, and positive emotions during bereavement among older adults. The study will be mainly guided by the Broaden-and-Build Theory of Positive Emotion, the Hope Theory, and the Revised Stress and Coping Theory. This dissertation is based on secondary data analysis using two different data - the Health and Retirement Study (HRS) for Paper 1 and the Complicated Grief Treatment in Older Adults Study (CGTOA) for Paper 2 and Paper 3. Paper 1 examines the level of positive and negative emotions before and after bereavement, and the impact of positive emotions on bereavement adjustment outcomes such as depression and purpose in life among a nationally representative sample of widowed older adults. Paper 1 finds that recently widowed older adults experience a significant decrease in positive emotions and an increase in negative emotions (compared to the married comparison group) after the loss of their spouse, but they still experience a considerable level of positive emotions during bereavement. The level of post-loss positive emotions was significantly associated with better adjustment outcomes, lower odds of having depression, and a higher level of purpose in life. A significantly greater impact of positive emotions on purpose in life was found among the widowed group compared to the married counterparts. However, the beneficial impact of positive emotions on depression did not differ between the widowed and married groups. Paper 2 and Paper 3 explore hope among the bereaved older adults with complicated grief using data from the CGTOA Study, a randomized clinical trial, which compared the treatment efficacy of complicated grief

treatment (CGT) with interpersonal psychotherapy (IPT). Paper 2 focuses on evaluation of the psychometric properties of the Trait Hope Scale (THS) among older adults with complicated grief before proceeding to address the role of hope in CGT in Paper 3. Paper 2 suggests that overall the THS is a valid and reliable tool to measure hope among older adults with complicated grief. The THS demonstrated its sensitivity to change with treatment, showing a significantly greater increase in hope score among treatment responders (in both CGT and IPT) compared to non-responders. However, unlike the theoretically supported two-factor structure of the THS (Pathways and Agency), a different two-factor structure was identified in the study, which suggests that further validation of the factor structure of the THS in older adults with complicated grief is necessary in future studies. Paper 3 investigates the role of hope in CGT, particularly examining hope as a potential moderator and/or mediator of treatment effects. Paper 3 found that both CGT and IPT groups increased their hope scores significantly during the treatment. However, there was no significant difference in increases in hope between CGT and IPT groups. Mediation analysis showed that hope is not a mediator of treatment effects of CGT over IPT. However, significant treatment effects of CGT (over IPT) were found for reduction in the level of grief-related avoidance among those with lower baseline hope, but not for those with higher baseline hope, which confirmed hope is a moderator of treatment effects for only the grief-related avoidance outcome. The findings of this dissertation suggest that 1) positive emotions during bereavement may play a beneficial role in adaption to bereavement, 2) the Trait Hope Scale is a valid and reliable tool to measure hope among older adults with complicated grief, and 3) hope can be improved in complicated grief interventions (both CGT and IPT), and regaining hope may be an important factor associated with the resolution of complicated grief symptoms.

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Introduction to the Dissertation

Losing a loved one to death is one of the most stressful events in life. According to the U.S. Census Bureau (2019), a death occurs every 11 seconds, which leaves more than thousands of people experiencing painful separation from their loved ones every day. Older adults experience bereavement more commonly due to the death of spouse than younger adults. More than 11 million older adults are widowed in the U.S. (U.S. Census Bureau, 2018). Counting loss of other family members and friends, which occur to older adults more frequently than spousal loss (Williams, Sawyer Baker, Allman, & Roseman, 2007), older adults are likely to experience multiple losses in their late life, which may place them at higher risks of having negative health consequences.

Bereavement is associated with increased risks of having physical and psychological health problems including higher risk of mortality during the early period of bereavement (for a review, see Stroebe, Schut, & Stroebe, 2007). However, most of the bereaved individuals adapt to bereavement over time as they come to terms with the death of loved ones and find new goals and plans in life (Bowlby, 1980). Many of them recover from post-loss functional disruptions in cognitive, emotional and interpersonal areas within one year (Bonanno & Kaltman, 2001).

Importantly, however, there is a proportion of bereaved individuals who experience much difficulty adjusting to bereavement, and exhibit maladaptive conditions such as depression, complicated grief (CG), and post-traumatic stress disorder (PTSD) (Kaltman & Bonanno, 2003; Schulz, Hebert, & Boerner, 2008; Shear, Ghesquiere, & Glickman, 2013). Approximately 16 to 30% of the bereaved show bereavement-related depression within the first year after loss (Carr & Utz, 2001; Schulz et al., 2008; Zisook & Shuchter, 1991, 1993) and approximately 9% of the bereaved older adults experience CG (Kersting, Brähler, Glaesmer, & Wagner, 2011). Factors

such as cause and timing of death (e.g. traumatic or sudden death), the relationship to the deceased, attachment styles (e.g. insecure attachment style), pre-loss mental health conditions, and social support have been found to be associated with bereavement outcomes (for a review, see Lobb et al., 2010; Stroebe, Folkman, Hansson, & Schut, 2006).

With the introduction of positive psychology (Seligman & Csikszentmihalyi, 2000), there has been more scholarly interest in the effects or roles of positive human strengths and capacities. Emerging evidence has pointed to the beneficial effects of positive psychology constructs such as positive emotions (e.g., interest, joy, and happiness) (Fredrickson, 1998) and hope (Snyder et al., 1991) in adjustment to stressful life situations including bereavement (e.g. Folkman & Moskowitz, 2000; Ong & Allaire, 2005; Ong, Bergeman, Bisconti, & Wallace, 2006; Ong, Edwards, & Bergeman, 2006; Tugade & Fredrickson, 2004). Studies found that presence of positive emotions and thinking among the bereaved were not uncommon, and the experience of positive emotions and thoughts may have a beneficial role in adaptation to bereavement (Bonanno & Kaltman, 2001).

However, the role of positive emotions and hope during bereavement has not been extensively studied to date. Importantly, to my knowledge, there has been no study that explored the relationship between a positive psychology construct and CG. Therefore, this three-paper dissertation will explore the role of positive emotions and hope during bereavement among older adults, focusing on the role of positive emotions in psychological adjustment to bereavement in Paper 1 and examining the role of hope in complicated grief treatment in Papers 2 and 3. The findings of this study will be used in the development of more effective clinical interventions and supportive programs, which may help the bereaved older adults adapt to bereavement.

Guided by the Broaden-and-Build Theory of Positive Emotion (Fredrickson, 2001), Hope Theory (Snyder et al., 1991), and Revised Stress and Coping Theory (Folkman, 1997), the study will examine the following aims and hypotheses:

Paper 1: The Impact of Positive Emotions on Psychological Adjustment After Loss of Spouse

Aim 1: To examine changes in the level of positive and negative emotions after loss among the widowed compared to the married.

H₁: There will be a significant decrease in positive emotions and an increase in negative emotions after loss in the widowed group compared to the married group.

Aim 2: To examine whether the loss of spouse and post-loss positive emotions are associated with post-loss outcome variables, depression, and purpose in life, while controlling for socio-demographic variables (e.g. age, gender, education), social support, and pre-loss status of outcome variables.

H₂₋₁: Loss of spouse will predict higher odds of having depression and a lower level of purpose in life.

H₂₋₂: The level of positive emotions will be significantly associated with depression status (negatively) and purpose in life (positively).

Aim 3: To examine whether the beneficial effects of positive emotions on depression and purpose in life are moderated by spousal loss status and duration of bereavement.

H₃₋₁: Spousal loss will moderate the relationship between positive emotions and outcome variables, depression and purpose in life. That is, the impact of positive emotions on depression and purpose in life will be greater among the bereaved group than the married group.

H₃₋₂: Duration of bereavement will moderate the relationship between positive emotions and outcome variables (i.e., depression and purpose in life). That is, the beneficial impact of positive emotions on depression and purpose in life will be greater among the recently widowed group compared to those who have been bereaved for more than one year.

Paper 2: Psychometric Evaluation of the Trait Hope Scale (THS) Among Bereaved Older Adults with Complicated Grief

Aim: To assess psychometric properties of the Trait Hope Scale (THS) among bereaved older adults with complicated grief by specifically examining its factor structure, internal consistency, and convergent and discriminant validity.

H₁: The THS will show good or acceptable psychometric properties in older adults with complicated grief (CG).

- a) Two-factor structure (Agency and Pathways) of the THS will be confirmed.
- b) The THS will show good or acceptable internal consistency, convergent validity, and discriminant validity in the study sample.

H₂: The THS will show sensitivity to change with treatment. That is, treatment responders will show a greater increase in hope during treatment compared to non-responders.

Paper 3: The Role of Hope in Complicated Grief Treatment Among Older Adults: Moderation and Mediation Analysis

Specific Aim 1: To examine changes in hope between pre- and post-treatment.

H₁₋₁: Both complicated grief treatment (CGT) and interpersonal psychotherapy (IPT) will significantly increase the level of hope among participants during the treatment.

H₁₋₂: CGT will increase the level of hope significantly more than IPT does during treatment.

Specific Aim 2: To test whether baseline hope moderates the relationship between treatment and treatment outcomes including treatment response, complicated grief symptoms (ICG), depressive symptoms (BDI), work and social adjustment (WSAS), and grief-related avoidance (GRAQ).

H₂: Baseline hope has moderating effects on the relationship between treatment and treatment outcomes. Specifically, the treatment effects of CGT over IPT will be greater among those with lower baseline hope than those with higher baseline hope.

Specific Aim 3: To test the mediating effects of hope between treatment and treatment outcomes including treatment response, complicated grief symptoms (ICG), depressive symptoms (BDI), work and social adjustment (WSAS), and grief-related avoidance (GRAQ).

H₃: Increase in hope mediates the treatment effects of CGT over IPT.

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Paper 1

The Impact of Positive Emotions on Psychological Adjustment After Loss of Spouse

Introduction

Loss of spouse is one of the most distressing and stressful life events that individuals can experience (Holmes & Rahe, 1967). Older adults experience spousal bereavement more often than younger adults. Approximately 34.2% of women and 11.6 % of men at the age of 65 and older are widowed, which comprises more than 11 million of the aging population in the US (U.S. Census Bureau, 2018). A number of studies have documented that bereavement is associated with increased risks of having negative physical and psychological health outcomes (for a review, see Stroebe, Schut, & Stroebe, 2007). Approximately 15-30% of the bereaved experience a clinically significant level of depression within first year of the loss of spouse (Carr & Utz, 2001). According to a population-based study, approximately 20% of the bereaved who lost their spouse experienced complicated grief (CG) (Kersting, Brähler, Glaesmer, & Wagner, 2011).

Bereavement studies have documented that the following factors may influence bereavement outcomes: loss-related factors (i.e., cause of death, expected or sudden death, time since loss, and the age of the deceased), quality of the marital relationship with the deceased, pre-loss health conditions, caregiving stress, social support, and income (e.g. Carr et al., 2000; Houwen et al., 2010; Schulz, Hebert, & Boerner, 2008; Stroebe, Folkman, Hansson, & Schut, 2006). With the finding that the bereaved individuals experience positive emotions as frequently as negative emotions during bereavement (Folkman, 1997), positive emotions have been examined as one of the factors that may explain individual differences in coping and adaptation to bereavement. According to current literature, positive emotions are associated with better bereavement outcomes such as reduced level of grief and depression, and positive emotions buffer the negative effects of stress and negative emotions on health outcomes (e.g. Bonanno &

Keltner, 1997; Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Folkman, 1997; Folkman & Moskowitz, 2000; Ong & Allaire, 2005; Ong, Bergeman, Bisconti, & Wallace, 2006; Tugade & Fredrickson, 2004; Tweed & Tweed, 2011; Zautra, Johnson, & Davis, 2005). However, the beneficial effects of positive emotions within the context of bereavement have been understudied. Many previous studies also have methodological limitations such as use of cross-sectional data, small convenience sample, not controlling for pre-loss status of bereavement outcomes and/or duration of bereavement, and lack of a comparison group.

In consideration of the current research gaps and limitations, Paper 1 aims to examine the role of positive emotions on psychological outcomes such as depression and purpose in life (a subjective well-being measure) using a nationally representative sample of the conjugally bereaved older adults with married older adults as the comparison group.

Literature Review

The Broaden-and-Build Theory of Positive Emotions

The Broaden-and-Build Theory of Positive Emotions posits that “the experience of positive emotions (e.g. joy/happiness, interest, contentment and love) broadens people’s momentary thoughts-action repertoires which in turn serves to build enduring personal resources (e.g., social, physical and psychological resources)” (Fredrickson, 2001, p. 218). In other words, the experience of positive emotions helps individuals think and act with a wide range of options momentarily (e.g. joyful feelings can make people play/ feeling interested can make people explore), unlike negative emotions which limit the scopes of their momentary attention, thinking, and actions (Fredrickson, 1998; Fredrickson, 2004). The experience of positive emotions can help individuals build up more permanent resources such as friendship, increased knowledge, and psychological resilience. Importantly, this theory posits that these resources can be utilized

when individuals face stressful situations later (Fredrickson, 1998; Fredrickson, 2001; Fredrickson, 2003). Therefore, the experience of positive emotions and personal resources developed through the experience of positive emotions may also improve individuals' psychological and physical well-being outcomes (Fredrickson, 2001).

Similarly, the Revised Stress and Coping Theory by Folkman (1997) highlights the importance of positive emotions (broadly positive psychological state) in the stress-coping process. In a study among caregivers of a partner with AIDS, Folkman (1997) found that caregivers experienced positive emotions as frequently as negative emotions during bereavement, except for the immediate period around the death of their partners. Even during the time around bereavement, caregivers showed a considerable level of positive emotion. These unexpected findings led to the revision of the original stress and coping theory by incorporating positive emotions in the stress and coping process model.

According to the Revised Stress and Coping theory (Folkman, 1997), individuals can experience positive emotions through reappraising stressful situations more positively (e.g. finding meaning and benefits in stressful situations), and goal-focused problem-solving coping. Also, the experience of positive emotions in everyday events such as having a conversation with a friend and watching a sunset can provide a break from stressful situations (Folkman, 1997, 2001; Folkman, Moskowitz, Ozer, & Park, 1997). This may further help the individuals regain their coping resources and continue to put effort into the coping process under stress (Folkman, 1997).

In support of these theories, studies on positive emotions documented favorable effects of positive emotions on health outcomes (for a review, see Pressman, Jenkins, & Moskowitz, 2019). A small number of studies in the context of bereavement also showed promising effects of

positive emotions on psychological outcomes during the bereavement (e.g. Bonanno & Keltner, 1997; Lund, Utz, Caserta, & De Vries, 2009; Moskowitz, Folkman, & Acree, 2003; Tweed & Tweed, 2011).

The Impact of Positive Emotions During Bereavement

Bonanno and Keltner (1997) examined the facial expression of 38 conjugally bereaved adults while they talked about their deceased spouse. They considered genuine smiles (known as Ducheness¹ smiles), which they cannot intentionally show without experiencing true excitement, as an indicator of positive emotions. The study found that positive emotions (e.g., enjoyment and amusement) at 6 months after loss is significantly associated with a reduction in grief at 24 months after loss, whereas those who showed negative emotions (e.g., sadness, anger, and fear) at 6 months after loss showed a significant increase in grief at 14 months and 25 months after loss.

Lund et al. (2009) examined the role of experience of positive emotions in adaptation to bereavement among relatively recent widow/ers at the age of 50 and over. The experience of positive emotions was measured using a 5-item scale, which asks respondents how strongly they agree with statements such as *I enjoyed humor of others, I had a good laugh, and I was happy about something* during the past week. About 75-90% of the bereaved endorsed each item positively, which indicates that the bereaved experience a high level of positive emotions. Experience of positive emotions was significantly associated with a lower level of grief and depression. Similarly, Tweed and Tweed (2011) found positive emotions (e.g. feeling excited and interested) measured at 6 months after spousal loss predicted lower depression and a higher

¹ Ducheness smile involves a muscle movement around the eye (*orbicularis oculi*), which cannot be made on purpose unless the individual experiences the true feeling of enjoyment (see Ekman, 1993). In the study by Bonanno and Keltner (1997), expression of the Ducheness smile alone indicates enjoyment, while the expression of Ducheness smile as the individual laughs with their mouth open is considered to indicate amusement.

level of social support (both giving and receiving) at 6, 18 and 48 months post-loss. The significant effects of positive emotions remained after controlling for pre-loss depression and level of grief (at 6 months). They also tested whether the effects of positive emotions on depression and social support are moderated by the level of grief (higher vs. lower). Significant interaction effects between positive emotions and grief were found only for depression at 6-months post-loss but not for 18- and 48-months post-loss depression (and all post-loss social support outcomes). That is, the positive impact of positive emotions on depression was larger for the group with a higher level of grief than the group with a lower level of grief at 6-months post-loss but not at later time points.

Through a series of longitudinal diary studies, Ong and his colleagues (e.g. Ong, Bergeman, & Bisconti, 2004; Ong et al., 2006; Ong, Fuller-Rowell, & Bonanno, 2010) advanced our understanding of the role of positive emotions during bereavement. One of the studies by Ong et al. (2004) asked 34 recently bereaved older adults (about 1 month after spousal loss) to record their daily positive emotions (e.g., cheerful/lighthearted, calm, peaceful, happy), daily depressive and anxiety symptoms, and rate their stress level for the most stressful event each day for 98 days. The study found that positive emotions reduce the impact of daily stress on depressive symptoms. Similar to the finding of Tweed and Tweed (2011), the buffering effects of positive emotions were significant when the bereaved experience high stress compared to low stress. However, positive emotions did not have any significant impact on anxiety when depressive symptoms were controlled. Another study by Ong et al. (2006) consistently confirmed the effects of positive emotions in reducing the negative impact of daily stress on negative emotions. In addition, they found that dispositional or coping factors (such as the resilience trait and humor coping trait) influence the relationship between positive emotions and negative

emotions including depressive symptoms (Ong et al., 2004; Ong et al., 2006). Their findings suggested that those who have a low level of the resilience trait or coping trait may be more vulnerable to stress or negative emotions when the level of positive emotions is low. At the same time, they may benefit more from the positive emotions under stress compared to those who have a high level of those traits.

In summary, existing empirical evidence suggests that the experience of positive emotions may have beneficial effects on adjustment to bereavement. However, many of the previous studies used very small convenience samples (e.g. Bonanno & Keltner, 1997; Ong et al., 2004; Ong et al., 2006), cross-sectional data (e.g. Lund et al., 2009), or did not use a comparison group (e.g. Bonanno & Keltner, 1997; Lund et al., 2009; Ong et al., 2004; Ong et al., 2006; Tweed & Tweed, 2011). In some of the longitudinal studies, pre-bereavement data regarding positive and negative emotions and psychological status, which may be confounded by outcome variables, were not measured or taken into account (e.g. Bonanno & Keltner, 1997; Ong et al., 2004; Ong et al., 2006). Also, most outcome variables in the previous studies were limited to depression, grief, or negative emotions. Thus, this paper aims to investigate the impact of positive emotions on purpose in life (i.e., one dimension of the psychological well-being measure by Ryff and Keyes (1995)), in addition to depression among a nationally representative group of conjugally bereaved adults compared to married older adults.

Studies found that having purpose or meaning in life is significantly associated with better mental health outcomes, and older adults are at higher risks of having a lower level of purpose in life as they experience many types of losses in life including bereavement (for review see Pinguart, 2002). King, Hicks, Krull, and Del Gaiso (2006) showed a significant positive relationship between positive emotions and purpose in life. However, there has not been a

previous study that examined the relationship between positive emotions and purpose in life in the context of bereavement. Therefore, this study selected purpose in life as one of the psychological outcome variables, which will extend our current knowledge of the role of positive emotions on psychological outcomes during bereavement.

Guided by the Broaden-and-Build Theory of Positive Emotions (Fredrickson, 1998) and the Revised Stress and Coping Theory by Folkman (1997) with supporting empirical evidence presented, this study (Paper 1) will examine the impact of positive emotions on psychological outcomes among those who experience loss of spouse as well as the level of positive and negative emotions before and after bereavement. This study has a specific interest in determining whether the impact of positive emotions on psychological outcomes is greater among the bereaved, who are likely to experience higher level of stress due to bereavement, compared to married counterparts. Similarly, this study will examine whether the impact of positive emotions on psychological outcomes is moderated by duration of bereavement.

The specific aims of Paper 1 with their corresponding hypotheses are:

Aim 1: To examine changes in the level of positive and negative emotions after loss among the widowed compared to the married.

H₁: There will be a significant decrease in positive emotions and an increase in negative emotions after loss in the widowed group compared to the married group.

Specific Aim 2: To examine whether loss of spouse and post-loss positive emotions are associated with post-loss outcome variables, depression and purpose in life, while controlling for socio-demographic variables (e.g. age, gender, education), social support, and pre-loss status of outcome variables.

H₂₋₁: Loss of spouse will predict higher odds of having depression and lower level of purpose in life.

H₂₋₂: Positive emotions will be significantly associated with depression status (negatively) and purpose in life (positively).

Specific Aim 3: To examine whether the beneficial effects of positive emotions on depression and purpose in life are moderated by spousal loss status and duration of bereavement.

H₃₋₁: Spousal loss will moderate the relationship between positive emotions and outcome variables, depression, and purpose in life. That is, the impact of positive emotions on depression and purpose in life will be greater among the bereaved group than the married group.

H₃₋₂: Duration of bereavement will moderate the relationship between positive emotions and outcome variables (i.e., depression and purpose in life). That is, the beneficial impact of positive emotions on depression and purpose in life will be greater among the recently widowed group (including two groups: 1) bereaved for 6 months or less, and 2) bereaved for 6 – 12 months) compared to those who have been bereaved for more than one year.

Methods

Data

The current analyses utilized data from the Health and Retirement Study (HRS). The HRS is a large-scale panel study that has collected data on health, disability, income, work, and retirement among a nationally representative sample of individuals who are over the age of 50 and their spouses/partners (spouses can be equal to or less than 50 years old) in the US (HRS, 2011)². HRS has followed study participants every two years since 1992, adding a new cohort

² For more information, go to <http://hrsonline.isr.umich.edu>

every 6 years. As of 2014, HRS has collected data for more than 28,000 individuals. Starting in 2006, the HRS core survey incorporated a psychosocial questionnaire, which collects information on personality, emotions, psychological wellbeing, and family and social relationships (Smith et al., 2013). However, for the psychosocial data collection, HRS divided its sample into two groups, Group A and Group B, by random selection, and collected psychosocial data for each group every other year in alternating sequences such as following Group A in 2006, 2010 and 2014 and Group B in 2008, 2012 and 2016 (See Table 1).

The current study used publicly available waves (total of four) of HRS data from 2008 to 2014, which covers two waves of psychosocial data for both Group A (2010 & 2014) and Group B (2008 & 2012).³ By pooling Group A and B, two waves, pre- and post-loss waves, were created for analysis. A group dummy variable, which indicates subgroups A and B, was controlled for in all data analysis.

Sample

The sample of this study is limited to those who are over the age of 50 and responded to both waves of the psychosocial questionnaire, and married at baseline (pre-loss). Since observations from each person in a couple are correlated (couples are likely to share similar characteristics), only one person from each couple household was randomly selected. The group of selected individuals (n=2,807) is similar to non-selected group (n= 2,807) across most of baseline socio-demographic characteristics and depression status, except race, positive emotions, and negative emotions. The group of selected individuals include more Asian American and American Indians and less Hispanics [$F(2.53, 141.86) = 3.414, p = 0.026$]. They have a slightly higher level of positive emotions [M: 48.21 vs. 47.69, difference = 0.516, $t=2.03, p = 0.047$] and

³ Since there were moderate changes in the questions and response categories for the key psychosocial variables after 2006, this study used HRS data from 2008 to 2014.

a slightly lower level of negative emotion [M: 20.28 vs. 20.65, difference = -0.368, $t = -2.11$, $p = 0.039$] compared to those who were not selected.

The sample of the current study is limited to individuals whose data on spousal loss status, duration of bereavement (only for the widowed group), and post-loss positive emotions are available ($N=3,565$). This sample includes 1) those who experienced spousal loss between pre- and post-loss wave ($n=439$) as a target group and 2) those who have been continuously married to the same spouse at both waves ($n=3,126$) as a comparison group (See Table 1).

Table 1. Description of Data and Study Sample

	Type of Data	Pre-loss (baseline)	Post-loss
HRS Survey Year	HRS Core data (e.g. socio-demographic and depression variables)	2008 and 2010	2012 and 2014
	Psychosocial data (e.g. positive and negative emotions, purpose in life, and social support variables)	2008 for Group B 2010 for Group A	2012 for Group B 2014 for Group A
Current Study Sample	Spousal Loss	Pre-loss (baseline)	Post-loss
	Yes (Widowed)	0	439
	No (Married)	3,565	3,126

Measures

Dependent variables

Depression was measured using a short version of the Center for Epidemiologic Studies Depression scale (CES-D) (CES-D; Radloff, 1997). The short version of CES-D includes 8 yes/no items, which asks whether respondents had depression-related symptoms for most of time in the past week (e.g. felt depressed, felt sad, felt alone, could not get going, everything is an effort, sleep was restless, felt happy and enjoyed life). Since the depression variable was very skewed with many cases equaling zero, it was dichotomized using a cutoff point of 4, which

indicates clinically significant depressive symptoms (Steffick, 2000). The 8-item CES-D short form showed good reliability and internal consistency (Steffick, 2000).

Purpose in life was measured using the 7-item subscale from the Psychological Well-Being Measure (Ryff & Keyes, 1995) which measures 6 dimensions of psychological wellbeing: purpose in life, self-acceptance, personal growth, positive relations with others, environmental mastery, and autonomy (see Smith et al., 2013). The subscale of purpose in life measures the extent to which respondents think their life has purpose and meaning on a 6-likert scale (1=Strongly disagree, 2= Somewhat disagree, 3=Slightly disagree, 4=Slightly agree, 5=Somewhat agree, and 6=strongly agree). The items include “*I enjoy making plans for the future and working to make them a reality*”, “*My daily activities often seem trivial and unimportant to me*”, “*I have a sense of direction and purpose in my life*” and “*I sometimes feel as if I have done all there is to do in life*”. Negative statements were reverse-coded before summing scores. A higher score means a higher level of purpose in life.

Independent variables

Positive Emotion in the HRS were measured by 13 items of positive emotions selected from the Positive and Negative Affect Schedule – Expanded Form (PANAS-X) with some from previous studies by Carstensen, Pasupathi, Mayr, and Nesselroade (2000) and Watson and Clark (1994) (see Smith et al., 2013). Both the PANAS and the PANAS-X are proven to be valid and reliable tools to measure positive and negative affect (D. & A., 1994; Watson, Clark, & Tellegen, 1988). The positive emotion questionnaire asks during the last 30 days how much respondents felt: determined, enthusiastic, active, proud, interested, happy, attentive, content, inspired, hopeful, alert, calm, and excited. Each item was rated on a 5-point scale (1= very much, 2=quite

a bit, 3 = moderately, 4= a little, and 5=not at all). All items were summed after being reverse-coded.

Another independent variable, loss of spouse (marital status), was dummy-coded based on the changes of marital status across waves. Those who experienced a loss between pre- and post-loss waves (2008 - 2012 for Group B and 2010 - 2014 for Group A) were coded as 1 and those who have been continuously married to the same spouse across waves were coded as 0.

Control variables

Key socio-demographic variables such as race, education, gender, income, and depression status at the pre-loss wave were used as control variables. Positive social support from spouse, children, other family members and friends were measured by three items on a 4-point scale for each relationship (1 = A lot, 2 = Some, 3 = A little and 4 = Not at all). The items ask how much respondents rely on or talk with family or friends when they have a problem.

In the HRS, self-rated health status was measured on a 5-point scale (1 = excellent, 2 = very good, 3 = good, 4 = fair and 5 = poor). For the current study, self-rated health was dichotomized with 1 for excellent and good health and 0 for fair and poor health condition. In the same way, self-rated health for spouse was dummy-coded.

Negative emotions were measured by 12 items of negative emotions selected from the Positive and Negative Affect Schedule – Expanded Form (PANAS-X), which was proved to be a reliable and valid measure to assess positive and negative affect (Watson & Clark, 1994), and from studies by Carstensen et al. (2000) and Watson and Clark (1994) (see Smith et al., 2013). In the survey, respondents are asked during the last 30 days, how much they felt: afraid, upset, guilty, scared, frustrated, bored, hostile, jittery, ashamed, nervous, sad, and distressed. Each item

was rated on a 5-point scale (1= very much, 2=quite a bit, 3 = moderately, 4= a little, and 5=not at all) and all items were summed after being reverse-coded.

Analysis

All data analysis in this Paper 1 was conducted using statistical software STATA 14 and weighted to the US population using respondent weight variables provided by the Health and Retirement Study (HRS). The t- and chi-square⁴ tests were used to examine bivariate relationships between spousal loss status (marital status) and baseline (pre-loss) socio-demographic characteristics, independent and dependent variables. The t-test was also used in order to examine both within- and between-group differences (widowed vs. married) in changes of positive and negative emotions between pre- and post-loss waves.

For specific aims 2 and 3, a series of multiple logistic regression models for the depression outcome and linear regression models for the purpose in life outcome were employed separately, while controlling for the same sets of covariates and the baseline (pre-loss) outcome variable. Model 1 estimated the impact of 1) spousal loss and 2) experience of positive emotions on post-loss depression and purpose in life controlling for the baseline condition of outcome variables. Models 2 and 3 added baseline socio-demographic variables, social support variables and duration of bereavement dummy variables⁵ (see footnote for details) sequentially. Since positive emotions scores at pre-loss and post-loss are highly correlated ($r = 0.62$), pre-loss level of positive emotions was not controlled for.

⁴ In Stata, chi-square statistic is transformed into an F-statistic to account for the survey design. Therefore, in Table 2, F-statistic was reported instead of chi-square statistic. See the Stata 14 manual (survey command section) for more information (<https://www.stata.com/manuals14/svysvytabulatetwoway.pdf>).

⁵ Three duration of bereavement (time-since-loss) dummy variables were created.

In order to keep the married comparison group in models 3, 4 and 5, the married were coded as 0 in all three dummy variables. Those who have been bereaved for more than one year are the reference group.

1) 6 months or less (1: bereaved for 6 months or less, 0: bereaved for 6 – 12 months and all married individuals).

2) 6 -12 months (1: bereaved for 6 - 12 months, 0: bereaved for 6 months or less and all married individuals).

3) More than 1 year (1: bereaved for more than one year, 0: bereaved for one year or less and all married individuals).

In order to test whether the impact of positive emotions on depression and purpose in life are greater for those who experienced bereavement, Model 4 added an interaction term between positive emotions and spousal loss to Model 3. Model 5 added two interaction terms between positive emotions and duration of bereavement (time-since-loss) dummy variables to Model 4 in order to test if the impact of positive emotions on depression and purpose in life is greater among relatively recent widows/ers compared to those who have been widowed for more than one year. In this study, spousal loss and duration of bereavement (time-since-loss) dummy variables were selected for bereavement-related stress and the intensity of bereavement-related stress, respectively, since direct measures for grief and stress were not available in the HRS data.

Results

Descriptive Statistics

According to the descriptive statistics in Table 2, the widowed and the married groups are significantly different in most of the baseline characteristics except two of the social support-related variables and self-rated health of respondents. With socio-demographic characteristics, the widowed group is older (70.23 vs. 62.44), less educated, has more women (71.9% vs. 43.4%), and has less income than the married group. In terms of self-rated health condition, the widowed group is not significantly different from the married group but they showed higher rates of having a spouse with poor/fair health condition (50.6% vs. 17.6%) than the married group at pre-loss wave. Also, they received a lower level of positive social support from their spouse and a higher level of positive support from their children than the married group. However, the level of positive social support they received from friends and other family members was not

Table 2. Baseline Descriptive Characteristics (Weighted)

	All		Widowed Group	Married Group	Bivariate Statistics p-value (see notes)
	% / M (SD)	Range	% / M (SD)	% / M (SD)	
Gender					
Female	46%		71.9%	43.4%	F(1, 56) = 124.203 p = 0.0000
Male	54%		28.1%	56.6%	
Age	63.15 (7.01)	51 – 93	70.23 (9.30)	62.44 (6.50)	t = 14.01 p = 0.000
Race					
White	84.27%		90%	83.74%	F(2.35, 131.58) = 3.7619 p = 0.0199
African Americans	5.54%		5.19%	5.55%	
Hispanics	7.37%		3.86%	7.70%	
Others (Asian)	2.82%		0.95%	3.01%	
Education					
High school or less	9.54%		14.25%	9.07%	F(2.69, 150.67) = 8.2788 p = 0.0001
Some college	33.35%		39.10%	32.77%	
College degree	24.86%		25.09%	24.84%	
Graduate	32.25%		21.56%	33.32%	
Self-Rated health					
Excellent/Good	82.68%		78.72%	83.1%	F(1, 56) = 3.5465 p = 0.0649
Fair/Poor	17.32%		21.28%	16.9%	
Spouse's self-rated health					
Excellent/Good	79.33%		49.45%	82.4%	F(1, 56) = 169.1061 p = 0.0000
Fair/Poor	20.67%		50.55%	17.6%	
Social support from Spouse	10.56 (1.51)	3-12	9.83 (2.16)	10.63 (1.43)	t = -5.56 p = 0.000
Social support from children	9.51 (1.81)	3-12	10.10 (1.87)	9.45 (1.79)	t = 4.22 p = 0.000
Social support from other family members	8.38 (2.13)	3-12	8.34 (2.60)	8.39 (2.09)	t = -0.20 p = 0.843
Social support from friends	9.04 (1.85)	3-12	9.20 (2.26)	9.02 (1.81)	t = 1.43 p = 0.157
Family Income (Annual)	101441 (101912.5)	0 - 1,767,500	66,563.66 (74642.62)	104,942.5 (102657)	t = -5.56 p = 0.000
Time since loss (by month)	20.93 (12.96)	0.49 - 50.56	20.86 (13.21)	NA	NA
0 - 6 months			17.7%		
6 - 12 months			15%		
More than 1 year			67.3%		
Positive Emotions	47.94 (8.16)	13 – 65	46.02 (9.26)	48.13 (8.03)	t = -3.16 p = 0.003
Negative Emotions	20.45 (5.68)	12 – 60	21.40 (6.71)	20.36 (5.56)	t = 2.81 p = 0.007
Depressive Symptoms (8 items of CES-D8)	1.05 (1.38)	0 – 8	1.38 (1.80)	1.01 (1.33)	t = 3.82 p = 0.000
Depression					
Yes (if CES-D8 >=4)	8.38%		14.16%	7.8%	F (1, 56) = 17.7930 p = 0.0001
No (if CES-D8 < 4)	91.62%		85.84%	92.2%	
Purpose in Life	33.84 (5.04)	8 – 42	32 (6.48)	34.02 (4.87)	t = -4.70 p = 0.000
Depression (Post-loss)					

Yes (if CES-D8 \geq 4)		25.2%	7.7%	F(1, 56) = 80.5674 p = 0.0000
No (if CES-D8 < 4)		74.8%	92.3%	
Purpose in Life (Post-loss)		30.70 (6.51)	33.10 (5.09)	t = -4.93 p = 0.000

Notes:

- Data are weighted at respondent level to the US population (Number of PSU: 112, Number of Strata: 56)
- In Stata, chi-square statistic is transformed into an F-statistic to account for the survey design. Therefore, F-statistic was reported instead of chi-square statistic in this table. See the Stata 14 manual (survey command section) for more information (<https://www.stata.com/manuals14/svysvtabulatetwoway.pdf>).

significantly different from that of the married group. Within the widowed group, the mean duration of bereavement is 20.93 months (SD: 12.96, range⁶: 0.49 – 50.56 months).

Approximately 33% of them are the relatively recent widows/ers who were bereaved for one year or less.

Before death of spouse, the widowed were already experiencing a significantly lower level of positive emotions (46.02 vs. 48.13, $t = -3.16$, $p = 0.003$) and a higher level of negative emotions than the married counterparts (21.40 vs. 20.36, $t = 2.81$, $p = 0.007$). They also showed significantly higher depression rates of 14.16% compared to 7.8% in the married group and a lower level of purpose in life compared to the married counterparts (32 vs. 34.02, $t = -4.70$, $p = 0.000$).

After spousal loss, the depression rate within the widowed group drastically increased to 25.2% while depression rates within the married group stayed at the baseline prevalence rate. Additionally, when looking at the depression rate only within the recently widowed individuals (widowed for one year or less), approximately 33% showed clinically significant depressive symptoms. Post-loss level of purpose in life among the widowed group was significantly lower than the married group (30.70 vs. 33.10, $t = -4.93$, $p = 0.000$).

⁶ The HRS data collection period for each wave is about one year spanning two calendar years (<http://hrsonline.isr.umich.edu>). Especially, for the wave of 2010, data was collected for a longer period from March 2010 through November 2011 (<http://hrsonline.isr.umich.edu/modules/meta/2010/core/desc/h10dd.pdf>). Therefore, there are individuals whose interview dates between pre- and post-loss waves are more than (or less than) four years apart. As a result, there are a small number of individuals whose duration of bereavement is a little over four years.

Changes in Positive and Negative Emotions after Loss

According to Table 3, the widowed group did not show significant changes in both positive and negative emotions between pre- and post-loss waves, whereas the married group had a slight decrease in positive emotions but had no significant change in negative emotions. When comparing the changes within the widowed group with the changes within the married group, there were no significant between-group differences in the changes of both positive (between-group difference = -0.83, $p = 0.246$) and negative emotions (between-group difference = 0.337, $p = 0.503$).

Widowed Group (WG)			WG-Subgroup 1: Recently Widowed Group			WG-Subgroup 2: Non-Recently Widowed Group			Married Group (Comparison Group)			
	Pre M (SD)	Post M (SD)	Pre-Post Diff (SE)	Pre M (SD)	Post M (SD)	Pre-Post Diff (SE)	Pre M (SD)	Post M (SD)	Pre-Post Diff (SE)	Pre M (SD)	Post M (SD)	Pre-Post Diff (SE)
PE	46.02 (9.27)	44.69 (9.39)	t = 2.01 p = 0.050 (see notes)	45.46 (8.79)	42.21 (8.70)	t = 2.88 p = 0.006	46.29 (9.49)	45.91 (9.50)	t = 0.50 p = 0.616	48.13 (8.03)	47.63 (8.15)	t = 2.74 p = 0.008
NE	21.43 (6.71)	21.83 (6.86)	t = -0.88 p = 0.383	20.87 (6.52)	23.87 (7.49)	t = -3.79 p = 0.000	21.73 (6.79)	20.75 (6.25)	t = 1.90 p = 0.063	20.33 (5.54)	20.39 (5.57)	t = -0.39 p = 0.697
Between-Group Differences												
	Widowed vs. Married Diff (SE)			Recently Widowed vs. Married Diff (SE)			Non-Recently Widowed vs. Married Diff (SE)					
PE	-0.83 (0.71) t = -1.17 p = 0.246			-2.76 (1.14) t = -2.43 p = 0.018			0.11 (0.82) t = 0.14 p = 0.891					
NE	0.337 (0.499) t = 0.67 p = 0.503			2.95 (0.81) t = 3.63 p = 0.001			-1.03 (0.56) t = -1.85 p = 0.070					

Notes:

- Data are weighted at respondent level to the US population.
- **PE** - Positive Emotions, **NE** - Negative Emotions
- The p-value of a t-test, which examined if there was a significant change in positive emotions (PE) after spousal loss among the widowed group, is exactly 0.05 but the 95% confidence intervals [CI: -0.0015213 2.662923] include zero. Based on the result, this study determined that the 1.33 point difference in PE between pre- and post-wave among the entire widowed group is not statistically significant at the .05 alpha level.

However, further analysis of two subgroups within the widowed group (recent vs. non-recent widow/ers), found that recently widowed older adults, who lost their spouse within one

year, experienced a significant decrease and increase in positive (pre-post difference = 3.26, $p = 0.006$) and negative (pre-post difference = -3.01, $p = 0.000$) emotions, respectively. However, the non-recent widowed older adults, who lost spouse more than one year ago, did not show significant changes in positive or negative emotions. In addition, the changes in positive (between-group difference = -2.76, $p = 0.018$) and negative emotions (between-group difference = 2.95, $p = 0.001$) within the recently widowed group were significantly different from the changes within the married group, whereas there were no significant differences in the changes of both positive and negative emotions between the non-recently widowed group and the married group.

Impact of Positive Emotions and Loss on Psychological Outcomes

The logistic regression results for the depression outcome (Model 3 in Table 4) showed that experience of spousal loss and positive emotions after loss are significant predictors of depression, while holding baseline depression, self-rated health status, and socio-demographic variables constant. Specifically, the odds of having depression for the widowed are 3.29 times higher than the odds for the married (OR=3.291, $p=0.000$). On average, a one point increase in positive emotion is associated with about a 9.1% decrease in the odds of having depression (OR=0.908, $p=0.000$). Those who have been bereaved for 6 months or less showed 2.68 times higher odds of having depression compared to those who have been bereaved for more than one (OR=2.682, $p=0.015$). However, there was no significant difference in the odds of having depression between those who have been bereaved for 6 to 12 months and those who have been bereaved for more than one year (OR=1.416, $p=0.548$).

There were no significant main effects of socio-demographic factors (i.e. race, gender, education and income), self-rate health of spouse, and level of positive social support from

Table 4: Multiple Logistic Regression for Depression (Weighted)

	Model 1	Model 2	Model 3	Model 4	Model 5
	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Group (A/B)	1.203 (0.205)	1.109 (0.230)	1.076 (0.224)	1.077 (0.224)	1.081 (0.226)
Depression_pre (Yes/No)	5.157*** (0.959)	2.594** (0.758)	2.661** (0.791)	2.668** (0.795)	2.640** (0.792)
Positive Emotions (PE)_post	0.896*** (0.007)	0.907*** (0.010)	0.908*** (0.010)	0.906*** (0.010)	0.907*** (0.010)
Spousal Loss (Yes/No)	4.013*** (0.733)	4.308*** (0.910)	3.291*** (0.850)	2.086 (2.000)	3.299*** (0.854)
Negative Emotions (NE)_pre		1.045** (0.015)	1.044** (0.016)	1.044** (0.016)	1.045** (0.016)
Time since loss (Ref: bereaved more than 1 year)					
6 months and less			2.682* (1.059)	2.675* (1.036)	7.573 (14.895)
6 to 12 months			1.416 (0.814)	1.459 (0.844)	0.208 (0.376)
PE x Spousal Loss				1.011 (0.022)	
Interaction terms between PE and Time-since-loss (Ref: bereaved more than 1 year)					
PE x 6 months and less					0.975 (0.044)
PE x 6 to 12 months					1.051 (0.044)
Age		1.009 (0.009)	1.009 (0.009)	1.009 (0.009)	1.009 (0.009)
Female		1.185 (0.202)	1.170 (0.199)	1.172 (0.198)	1.175 (0.199)
Education (Ref: College degree)					
Less than HS		0.762 (0.226)	0.768 (0.227)	0.768 (0.227)	0.776 (0.229)
High School		0.859 (0.203)	0.872 (0.204)	0.875 (0.204)	0.890 (0.208)
Some College		1.422 (0.380)	1.467 (0.375)	1.470 (0.378)	1.499 (0.387)
Race (Ref: Other races)					
African American		0.454 (0.326)	0.460 (0.327)	0.456 (0.323)	0.457 (0.324)
White		0.493 (0.327)	0.484 (0.319)	0.480 (0.316)	0.483 (0.318)
Hispanic		0.905 (0.673)	0.888 (0.654)	0.882 (0.649)	0.885 (0.652)
Family income (log)		0.906 (0.078)	0.906 (0.079)	0.906 (0.080)	0.906 (0.078)
Self-rated health		0.378*** (0.073)	0.379*** (0.072)	0.380*** (0.072)	0.377*** (0.071)
Spouse's self-rated health		0.874 (0.168)	0.885 (0.169)	0.887 (0.170)	0.892 (0.169)
Social support from spouse		1.015 (0.051)	1.011 (0.051)	1.013 (0.051)	1.013 (0.052)
Social support from children		0.982 (0.035)	0.982 (0.035)	0.983 (0.035)	0.983 (0.035)
Constant	6.233*** (2.096)	9.698 (16.503)	10.037 (17.020)	10.559 (17.858)	9.866 (16.694)
Observations	19,419	18,852	18,852	18,852	18,852

Subpop observations	3,476	2,909	2,909	2,909	2,909
Notes: *** p < 0.001, ** p < 0.01, * p < 0.05					
Data are weighted at respondent level to the US population.					

children and spouse (see Model 3). Only pre-loss depression, negative emotions, and self-rated health of respondents are significantly associated with post-loss depression status when holding other variables constant.

Models 4 and 5 tested if the beneficial effects of positive emotions on depression are greater for the widowed compared to the married (Model 4), and for recently widowed older adults compared to those who have been widowed for more than one year (Model 5). The regression results of Model 4 showed that the impact of positive emotions on the odds of having depression did not depend on spousal loss status (OR=1.011, p=0.612), which did not support the hypothesis of the study. Similarly, the impact of positive emotions on the odds of having depression did not differ by duration of bereavement. That is, the impact of positive emotions on the odds of having depression for both 1) those who were bereaved for 6 months or less (OR=0.975, p = 0.582) and 2) those who were bereaved for 6 to 12 months (OR=1.051, p=0.237) was not significantly different compared to those who were bereaved more than one year.

Five models for the purpose in life outcome were tested in the same way as the depression outcome, except linear regression was used instead of logistic regression. Their results were noticeably different from the results of the depression outcome. According to Table 5, the experience of spousal loss was a significant predictor of purpose in life in Model 1, but it was no longer significant when baseline characteristics were controlled for in Model 3 ($\beta=0.137$, p=0.778). However, as hypothesized, experience of positive emotions was a significant factor predicting purpose in life after holding baseline characteristics constant. On average, a one point

increase in positive emotions was significantly associated with a 0.247 point increase in the level of purpose in life ($\beta=0.247$, $p=0.000$).

Table 5: Multiple Linear Regression for Purpose-in-Life (Weighted)					
	Model 1	Model 2	Model 3	Model 4	Model 5
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Group (A/B)	0.095 (0.168)	0.014 (0.208)	0.022 (0.210)	0.020 (0.209)	0.025 (0.209)
Purpose-in-life_pre	0.458*** (0.019)	0.400*** (0.022)	0.398*** (0.022)	0.399*** (0.022)	0.399*** (0.022)
Positive Emotion (PE)_post	0.249*** (0.013)	0.248*** (0.013)	0.247*** (0.014)	0.239*** (0.014)	0.246*** (0.014)
Spousal Loss (Yes/No)	-0.737* (0.327)	-0.127 (0.372)	0.137 (0.483)	-4.004* (1.705)	0.138 (0.484)
Negative Emotion (NE)_pre		-0.036 (0.019)	-0.038* (0.019)	-0.039* (0.019)	-0.038* (0.019)
Time since loss (Ref: bereaved more than 1 year)					
6 months and less			0.101 (0.788)	0.351 (0.826)	0.931 (2.734)
6 to 12 months			-1.578 (0.868)	-1.161 (0.871)	-5.241 (3.335)
PE x Spousal Loss				0.090** (0.033)	
Interaction terms between PE and Time-since-loss (Ref: bereaved more than 1 year)					
PE x 6 months and less					-0.020 (0.058)
PE x 6 to 12 months					0.090 (0.076)
Age		-0.061*** (0.014)	-0.061*** (0.014)	-0.060*** (0.014)	-0.061*** (0.014)
Female		0.187 (0.175)	0.191 (0.174)	0.215 (0.173)	0.193 (0.175)
Education (Ref: College degree)					
Less than high school		-0.976* (0.399)	-1.006* (0.400)	-1.014* (0.395)	-1.006* (0.400)
High School		-0.446 (0.234)	-0.452 (0.233)	-0.455 (0.232)	-0.448 (0.232)
Some College		-0.213 (0.213)	-0.236 (0.213)	-0.234 (0.213)	-0.229 (0.216)
Race (Ref: Other races)					
African American		2.047* (0.874)	2.050* (0.876)	2.031* (0.875)	2.043* (0.877)
White		0.595 (0.757)	0.596 (0.759)	0.583 (0.755)	0.596 (0.759)
Hispanic		0.979 (1.016)	0.993 (1.017)	0.984 (1.015)	0.994 (1.017)
Family Income (log)		0.352 (0.188)	0.350 (0.189)	0.347 (0.188)	0.350 (0.189)
Self-rated health		0.289 (0.276)	0.293 (0.272)	0.298 (0.271)	0.290 (0.271)
Spouse's self-rated health		-0.222 (0.276)	-0.214 (0.276)	-0.190 (0.270)	-0.211 (0.277)
Social support from spouse		-0.030 (0.069)	-0.028 (0.069)	-0.019 (0.068)	-0.027 (0.069)

Social support from children		0.012 (0.053)	0.010 (0.053)	0.013 (0.053)	0.011 (0.053)
Constant	5.632*** (0.591)	8.044* (3.034)	8.167** (3.037)	8.375** (2.996)	8.174** (3.033)
Observations	19,295	18,774	18,774	18,774	18,774
Subpop observations	3,352	2,831	2,831	2,831	2,831

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05
Data are weighted at respondent level to the US population.

Among baseline characteristics, only negative emotions, age, race and education had main effects on purpose in life (see Model 4). Baseline age and negative emotion were negatively associated with the level of purpose in life. African Americans showed a higher level of purpose in life than those with the other racial backgrounds (i.e. Asian American, American Indian and Pacific Islander). Those with high school education showed a lower level of purpose in life than those with a college degree.

Interestingly, Model 4, which tested interaction effects between positive emotions and spousal loss (i.e., moderating effects of loss on the relationship between positive emotions and purpose in life), found that the impact of positive emotions on purpose in life was significantly greater among the widowed than the married counterparts ($\beta=0.09$, $p=0.008$). That is, on average, a one point increase in positive emotions is associated with a 0.329 point increase in purpose in life for the widowed, while a one point increase in positive emotions was associated with a 0.239 point increase in purpose in life for the married. However, when testing interaction effects between positive emotions and duration of bereavement, no moderating effects of duration of bereavement on the relationship between positive emotions and purpose in life were observed.

Discussion

This study found that overall the widowed older adults experience a lower level of positive emotions and a higher level of negative emotions compared to the married group at both

pre- and post-loss waves. However, when comparing the within-group changes in both positive and negative emotions between pre- and post-loss, the widowed group did not experience a significant change in both positive and negative emotions. Subgroup analysis showed that the recently widowed older adults (bereaved for one year or less) experienced a significant decrease in positive emotions and a significant increase in negative emotions after spousal loss and the changes were significantly greater than the changes within the married group, whereas the non-recently widowed group (bereaved for more than one year) did not show significantly different changes in both positive and negative emotions. However, the recently widowed still showed they experience a considerable level of positive emotions during the bereavement (see Table 3).

Bereavement studies agree that the bereaved experience intense grief and distress due to bereavement but the majority adapt to bereavement over time and return to their pre-loss level of function within one year after loss (Bonanno & Kaltman, 2001). The duration of bereavement in the widowed group of this study has a range of less than one month to a little over four years with the mean of 21 months. The majority (67.3%) of the widowed older adults in this study lost their spouse more than one year ago. Therefore, the subgroup analysis showing significant changes in both positive and negative emotions within the recently widowed group but not within the non-recently widowed group may be due to the possibility that many of the non-recent widow/ers already returned to their pre-loss level of positive and negative emotions and thus any emotional changes they experienced during the early bereavement period were not reflected in the data. It is also possible that many of those who experienced loss of spouse may already have experienced a high level of distress before the death of spouse due to caregiving stress (Schulz et al., 2008) or impending death at the time of pre-loss assessment. Therefore, their level of

emotions may have been already greatly affected before the pre-loss assessment took place, and as a result they may have showed relatively less change in emotions after loss.

The main goal of this study was to confirm whether experience of positive emotions is significantly associated with better psychological outcomes among widowed older adults, and to further examine whether the impact of positive emotions on psychological outcomes are greater among widowed older adults (compared to the married older adults) and among recently widowed older adults (compared to older adults widowed for more than one year). As hypothesized and consistent with current literature on positive emotions, this study confirmed that experience of positive emotions is significantly associated with post-loss depression (negatively) and purpose in life (positively) outcomes after controlling for baseline characteristics including pre-loss depression and purpose in life.

However, moderation analysis showed interesting and somewhat mixed results, which will require further studies. The current study did not find that the impact of positive emotions on depression is greater among the widowed than the married. Even when comparing the recent widow/ers (who are likely to have a higher level of bereavement stress) with non-recent widow/ers, there was no significant difference in the impact of positive emotions on depression.

This conclusion differs from those of previous studies. Two previous studies (e.g. Ong et al., 2004; Tweed & Tweed, 2011) showed greater effects of positive emotions on depressive symptoms among the bereaved with a higher level of grief or stress compared to those with a lower level of grief or stress. However, in the study by Tweed and Tweed (2011), the greater effects of positive emotions on depression among those with a higher level of grief were found only for 6-months post-loss, but not for 18- and 48-months post-loss. The authors argued that the significant moderating effects of grief may be attributed to the fact that positive and negative

affect tend to be more strongly correlated with each other at the time of stress as the Dynamic Model of Affect posited (Reich, Zautra, & Davis, 2003; Zautra et al., 2005).

The discrepancy between previous findings and the current study may be partly due to the use of spousal loss status and duration of bereavement to measure bereavement stress and the intensity of bereavement stress, respectively. Individuals do not react to bereavement in the same way (Bonanno & Kaltman, 2001). Some people may adjust to bereavement relatively well, whereas other people may experience a harder time adjusting to bereavement having intense grief for a relatively long period of time (Lotterman, Bonanno, & Galatzer-Levy, 2014). The individual's perceived level of stress due to the loss of spouse and their adaptation process may vary depending on many other factors such as death-related factors (e.g. sudden or violent death), personality, pre-loss mental health conditions, and the appraisal and coping process (Stroebe et al., 2006). As a consequence, it is possible that the spousal loss and duration of bereavement variables may not have reflected the true level of bereavement stress and grief. Also, married individuals may experience a higher level of distress due to the current health conditions of their spouses/themselves or caregiving burden, a loss of other family member or friend, and other reasons including relational and financial problems in everyday life. Hahn, Cichy, Small, and Almeida (2013) found that the married older adults experience more daily stressors including relationship-related stressors than the bereaved older adults. Therefore, future studies which use a direct measure of grief and bereavement-related stress is necessary to address this possibility.

Unlike the depression outcome, this study found that the impact of positive emotions on the purpose in life outcome is greater among the widowed group than the married group. That is, positive emotions may have more beneficial effects on finding purpose and meaning in life for

the bereaved compared to the married counterparts. However, the impact of positive emotions on purpose in life did not differ between the recent widow/widowers and non-recent widow/ers.

In summary, this study consistently confirmed that the bereaved experience positive emotions as well as negative emotions during bereavement, and that the experience of positive emotions during bereavement may predict better psychological outcomes such as depression and purpose in life in a more representative sample of the bereaved older adults. The finding of significantly greater effects of positive emotions on purpose in life, but not on depression, among the widowed older adults indicates that the widowed older adults may benefit more from the experience of positive emotions for certain adjustment outcomes. At the same time, further studies are needed to address the discrepancy with previous studies in regards to the effect of positive emotions on depression. Overall, the findings of this study support the current literature that experience of positive emotions during bereavement is common and that they may help older adults adapt to loss of their spouse, opposing the long believed assumption that experience of positive emotions may be a sign of denial or maladaptation (see Wortman & Boerner, 2007).

Limitations

We should take into account the following limitations of this study when interpreting the findings of this study. First, the sample of this study is limited to conjugally bereaved older adults, so the findings of this study may not be generalizable to the bereaved who lost other family members or friends. Due to the study design and availability of information on key variables, the widowed sample in this study are representative of those who have been widowed for one-half month to a little over four years. In addition, although the sample of the HRS study is a nationally representative sample and all data analysis in the current study was weighted to the US population, the sample of the current study may not hold the same level of

representativeness of US population due to the fact that many observations were dropped because they lacked values for key variables.

Secondly, this study randomly selected one person from a couple households for the married comparison group. Those who were selected were similar to those who were not selected in most of baseline characteristics. However, the selected individuals showed a slightly higher level of positive emotions and lower level of negative emotions than those who were not selected. Both groups also have a significantly different racial proportion. This difference may have influenced the findings of the study.

Thirdly, this study used spousal loss and duration of bereavement variables to account for the overall bereavement-related stress and its intensity, respectively, since there were no direct measures for stress and grief in the HRS data. This may have increased measurement errors. Also, the use of self-reporting measures may have increased measurement errors.

Lastly, this study cannot determine a causal relationship between positive emotions and outcome variables, depression, and purpose in life, although this study controlled for baseline depression status and other socio-demographic characteristics. We cannot rule out the possibility that depression and the level of purpose in life may influence the level of positive emotions.

Study Implications

Taking into account the limitations of the current study, further studies on the effects of positive emotions on bereavement adjustment are necessary. Studies with large longitudinal data, which collect information on positive emotions more frequently (such as daily, weekly or monthly) and include other psychological adjustment outcomes such as complicated grief and anxiety will extend our understanding of the role of positive emotions during the stressful time of life after loss of spouse. Pressman and Bowlin (2014) pointed out that certain types of positive

emotions may have a stronger impact on certain health outcomes. It may be possible that certain positive feelings would be more beneficial in adjustment to bereavement. Therefore, it will be necessary to examine the impact of certain type of positive emotions on bereavement outcomes, as well as the impact of the inclusive overall level of positive emotions. Also, further studies investigating the relationship between trait and coping variables and positive emotions will give us additional information for a better understanding of the role of positive emotions.

The findings of this study may be implemented in both clinical and non-clinical practice from the strength-based perspective. This study provides more motivation for social workers and practitioners to increase the awareness of the beneficial effects of positive emotions and encourage the experience of positive emotions among the bereaved and their family members or friends, which may in turn help the bereaved experience more positive emotions. Also, the findings of this study may provide a strong basis to guide the development and evaluation of evidence-based intervention and supportive programs that facilitate the experience of positive emotions for the bereaved older adults.

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Paper 2

**Psychometric Evaluation of the Trait Hope Scale (THS) Among Bereaved Older Adults
with Complicated Grief**

Introduction

Accumulating empirical evidence has shown that hope is a psychological and resilience factor that is associated with psychological adjustment, physical health, effective coping and treatment outcomes (for a review, see Snyder, 2002). However, little is known about the impact of hope on coping with bereavement. Though a small number of previous studies on hope among bereaved individuals suggest that hope is positively associated with better psychological outcomes such as depression and anxiety (Chow, 2010; Michael & Snyder, 2005), none of the studies in the current literature have examined the role of hope in Complicated Grief (CG), a mental health condition listed as prolonged grief disorder in the 11th edition of the International Classification of Diseases (ICD-11) by the World Health Organization. CG is a unique mental health condition different from major depression and post-traumatic stress disorders, which often co-occurs with CG (Holly G Prigerson et al., 1995; Shear et al., 2011). Considering the fact that CG influences a significant number of bereaved individuals and is more prevalent in older adults who are likely to experience a loss of loved one than younger adults (Kersting, Brähler, Glaesmer, & Wagner, 2011; Newson, Boelen, Hek, Hofman, & Tiemeier, 2011), it is of interest to explore the role of hope on adjustment to loss and CG symptoms and treatment.

The Trait Hope Scale (THS) is one of the widely used self-report hope measurements with good validity and reliability in research studies (Snyder, 2002). However, the psychometric properties of the THS have not been tested in the bereaved population with CG, which warrants a study that examines psychometric properties of the THS in bereaved people with CG before any studies on hope in CG. Therefore, this study (Paper 2) will evaluate whether the THS is a valid and reliable measure for hope in studies of bereaved older adults with CG using data from the

Complicated Grief Treatment in Older Adults (CGTOA) study, which used the THS to measure hope.

Literature Review

Complicated Grief

Complicated grief (CG) is a mental health condition that occurs when something interferes with the natural healing process of bereaved individuals (Shear et al., 2016). The main symptoms of CG include persistent grief reactions such as persistent yearning for the deceased, preoccupation with the deceased, and intense emotional pain including sadness and guilt (ICD-11). Individuals with CG experience significant functional impairments in domains such as personal, social and work areas (ICD-11). Studies found that CG is associated with increased risks of having suicidal ideation, substance use, sleep, and cardiovascular problems (Shear, 2015).

In general, the bereaved experience acute, and often intense, grief immediately after loss (Shear, 2015). The intensity of grief subsides over time as the bereaved come to terms with the death of their loved ones (Bowlby, 1980). However, studies found that a significant minority of bereaved individuals are suffering from CG and CG is more prevalent in older adults (Kersting et al., 2011; Newson et al., 2011). According to a population-based study, the prevalence rate of CG among bereaved older adults over the age of 61 is 9%, whereas it is 6.7% among the bereaved population over the age of 14 (Kersting et al., 2011). In a Dutch population study by Newson et al. (2011), 24.5% of the bereaved aged 55 and over showed CG symptoms. With the growing aging population, more bereaved older adults will be at the risk of developing CG and the consequences of having unresolved grief over a long period of time may be more detrimental to older adults who are likely to experience chronic health problems.

Snyder's Hope Theory

The Hope Theory proposed by Snyder and his colleagues (1991) has been widely studied and cited in the literature during the past two decades (Lopez, Snyder, & Pedrotti, 2003). Snyder et al. (1991) defined hope as “a positive motivational state that is based on an interactively derived sense of successful agency (goal-directed energy) and pathways (planning to meet goals)” (p.287). Pathways refers to the individual's belief in their ability to plan or generate ways to achieve their goals (Snyder et al., 1991). Agency refers to the individual's belief in their ability to motivate themselves to achieve the goals using pathways. That is, hope is viewed as a cognitive construct reflecting the individual's belief that they can find and create pathways to reach the goals they want and motivate themselves to attain the goals using the pathways.

Though the Hope Theory views hope as primarily cognitive, Snyder et al. (1991) also acknowledges that individuals experience positive or negative emotions based on their appraisals on whether they are achieving or making successful progress toward their goals (Snyder, Lehman, Kluck, & Monsson, 2006; Snyder, 2002). Importantly, the Hope Theory posits that hope is associated with the individual's appraisals and coping process in stressful situations (Snyder et al., 1991). That is, individuals with higher hope are likely to be engaged in active coping efforts and to appraise their stressful situations as challenging (rather than threatening) compared to those with lower hope (Snyder et al., 1991).

Psychometric Property of the Trait Hope Scale (THS)

The Trait Hope Scale (THS) (Snyder et al., 1991) is a widely used self-report instrument that Snyder et al. (1991) developed in order to measure dispositional hope for adults (Brouwer, Meijer, Weekers, & Baneke, 2008). The THS is a 12-item self-report measure, which consists of four agency-related items (e.g., *I energetically pursue my goals*), four pathway-related items

(e.g., *I can think of many ways to get out of a jam*), and four distractor items, which do not count towards scoring. Each item is scored on a four-point scale from 1 (definitely false) to 4 (definitely true). Only agency- and pathways-related items (total 8 items) are included in the total hope score. The THS has been extensively tested and has shown good or acceptable validity and reliability (Snyder, 2002). For example, Cronbach's alpha for the scale is in the range of .74 to .88 and test-retest reliability coefficient was .82 for 3-week intervals and .85 for 10-week intervals (Snyder, 2002). Convergent validity of the THS was also confirmed by moderate correlations with theoretically-related measurements such as the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) ($r = -.42$), the Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974) ($r = -.51$), the Rosenberg Self-Esteem Scale (Rosenberg, 1965) ($r = .58$) and the Life Orientation Test measuring optimism (Scheier & Carver, 1985) ($r = .6$) (see Snyder et al., 1991).

The THS was developed to include two sub-scales corresponding to hypothesized sub-constructs of hope, agency and pathways, considered to be related but unique constructs (Snyder et al., 1991). Although the scale is generally used as a composite (total sum) score in analysis, some scholars have examined effects of each sub-construct on study outcomes as well as the overall effects of hope as Snyder et al. (1991) also recommended (e.g. Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007; Chang, 2003; Chow, 2010; Cramer & Dyrkacz, 1998; Tong, Fredrickson, Chang, & Lim, 2010). Arnau et al. (2007) found in their longitudinal study with college students that agency construct predicts depression and anxiety but pathways construct does not. In a study among bereaved Chinese people in Hong Kong, Chow (2010) found that agency has significant moderating effects on the impact of bereavement on anxiety while both total hope and pathways do not.

However, existing studies show mixed results with respect to factor analysis and the use of the subscales of agency and pathways in analysis. Brouwer et al. (2008) argued that the THS is an unidimensional scale as each agency and pathways construct are highly correlated, and each construct does not seem to uniquely explain the variance of hope more than the shared variance between agency and pathways, whereas other studies showed hope scale is a two-factor measurement as Snyder's Hope Theory postulates. Similarly, two recent studies in Spain by Galiana, Oliver, Sancho, and Tomás (2015) and Espinoza et al. (2017) also confirmed that hope scale is a unidimensional measurement by presenting good model fit for a one-factor model compared to two-factor and bifactor models. These mixed findings on the factor structure of the hope scale require validation of the factor structure of the hope scale before using the subscales of agency and pathways in analysis. In addition, most psychometric studies of the THS used samples consisting mainly of college students (e.g. Babyak, Snyder, & Yoshinobu, 1993; Galiana et al., 2015; Roesch & Vaughn, 2006) or community adult samples mostly with young and middle aged adults (Espinoza et al., 2017; e.g. Gana, Daigre, & Ledrich, 2012) and few used clinical samples such as psychiatric patients, traumatic injury patients, those who sought treatment for mental disorder or emotion-related problems, and cancer patients (e.g. Brouwer et al., 2008; Creamer et al., 2009; Espinoza et al., 2017; Sun, Ng, & Wang, 2012). Most importantly, the THS has not been tested among individuals with CG.

Therefore, the current study (Paper 2) will examine the psychometric properties of the THS by looking into its reliability, validity, factor structure and sensitivity to change among help-seeking older adults with CG, who participated in a randomized controlled trial of complicated grief treatment by Shear et al. (2014). This study (Paper 2) has the following aim and hypotheses:

Aim: To assess the psychometric properties of the Trait Hope Scale (THS) among bereaved older adults with complicated grief (CG) by specifically examining its factor structure, internal consistency, convergent and discriminant validity and sensitivity to change with treatment.

H₁: The THS will show good or acceptable psychometric properties in older adults with CG.

- a) Two-factor structure of the THS will be confirmed.
- b) The THS will show good or acceptable internal consistency, convergent and discriminant validity in the study sample.

H₂: The THS will show sensitivity to change with treatment. That is, treatment responders will show a greater increase in hope during treatment compared to non-responders.

Methods

Data and Study Sample

This study used the data collected from the Complicated Grief Treatment in Older Adults (CGTOA) study, which is a randomized clinical trial of complicated grief treatment (Shear et al., 2014). The CGTOA study was designed to compare complicated grief treatment CGT to Interpersonal Psychotherapy (IPT), an evidence-based treatment developed for depression that can have a focus on grief (Weissman, Markowitz, & Klerman, 2000). CGT was developed to target CG, considering the low response of IPT for CG symptoms (Shear & Bloom, 2016).

The CGTOA study participants were recruited from 2008 to 2013 in the New York metropolitan area through community outreach activities (Shear et al., 2014). Participants⁷ are individuals who are over 50 and above, have been bereaved for at least 6 months, and meet the criteria of CG. The criteria of CG include a score of 30 and above on the Inventory of

⁷ The inclusion criteria include a score of 30 and above on the Inventory of Complicated Grief and confirmation of the presence of CG symptoms through a structured clinical interview for CG. Those who currently have a history of substance abuse disorder, bipolar I disorder, active suicidal ideation or psychotic disorder were excluded. Those who scored below 24 on Mini-Mental State Exam and currently receive other psychotherapies were also excluded.

Complicated Grief (ICG), a self-reported measure of CG, and confirmation of the CG on an expert clinical interview (see Shear et al., 2014 for inclusion and exclusion criteria). A total of 151 eligible participants were randomly assigned into either CGT (n=74) or IPT (n=77). In both groups, 16 individual therapy sessions were provided for a 16-20 week period and the participants were followed for 6 months after treatment.

The sample of the current study (Paper 2) is bereaved older adults with CG who were randomized to treatment in the CGTOA study. Only those who completed baseline hope assessment at week 1 were included in the study sample (N=139).

Measures

Study participants were assessed by a set of self-report and independent evaluator measures. The Trait Hope Scale (THS) by Snyder et al. (1991) was used to measure the level of hope. The THS is a 12-item self-reported measure, which consists of four agency-related items (e.g. *I energetically pursue my goals.*), four pathway-related items (e.g. *I can think of many ways to get out of a jam.*), and four distractor items, which do not count towards scoring. Each item is rated on a 4-point likert-type scale (1=Definitely false, 2=Mostly true, 3=Mostly false, 4=Definitely False). The THS has been extensively tested and has showed good or acceptable validity and reliability (Snyder, 2002).

The Inventory of Complicated Grief (ICG) is a 19-item self-reported measure of CG symptoms, which is one of the widely used measures of CG symptoms and demonstrated good validity and reliability (Holly G. Prigerson et al., 1995).

The Structured Clinical Interview for Complicated Grief (SCI-CG) is another tool developed to measure clinical CG symptoms (e.g. *intense feelings of sorrow or emotional pain, yearning and longing of the deceased, and guilty or self-blaming thoughts or belief related to the*

death) in a CGT study (Shear, Frank, Houck, & Reynolds, 2005). The SCI-CG is a 31-item measure administered by clinicians and each item is rated on a three-point response scale (1=Not present, 2=Unsure or equivocal, 3=Present)(Bui et al., 2015). According to Bui et al. (2015), the SCI-CG demonstrated acceptable internal consistency ($\alpha = .78$), good test and retest reliability (ICC = 0.68), and convergent validity.

The Beck Depression Inventory (BDI) is a widely used 21-item self-report depression measure with good internal consistency ($\alpha = 0.76 - 0.95$ for clinical samples, $\alpha = 0.73 - 0.92$ for non-clinical samples) and validities for both clinical and non-clinical samples (Beck, Steer, & Carbin, 1988). The BDI measures depression symptoms and attitudes such as sadness, guilty feeling, sleep, loss of appetite, and suicidal ideation rated on a four-point response scale.

The Grief Related Avoidance Questionnaire (GRAQ) is a 15-item self-reported questionnaire that measures avoidance behaviors in activities that remind the bereaved of the loss of their loved one (e.g. *Do you avoid places that are associated with the death?* and *Do you avoid rooms or places that you associate with the person who died?*) (Shear et al., 2007). The GRAQ demonstrated good reliability ($\alpha = 0.78 / ICC = 0.88$) and validity among individuals with CG (Shear et al., 2007).

The Work and Social Adjustment Scale (WSAS) is a valid and reliable 5-item self-report measure ($\alpha = 0.70 - 0.94 / ICC = 0.73$) that rates the perceived level of impairment in work and social functioning due to grief (e.g. *ability to work, home management, maintaining private and social leisure activities and maintaining social relationships*) (Mundt, Marks, Shear, & Greist, 2002). Each item is rated on an 8-point severity scale (Mundt et al., 2002).

The Interpersonal Support Evaluation List (ISEL) is a widely used 40-item self-report measure for perceived social support (Cohen & Hoberman, 1983). The ISEL measures four

specific dimensions of social support such as appraisal support, tangible support, self-esteem support and belonging support. A recent psychometric evaluation of the ISEL among the individuals in CG showed good internal consistency of the ISEL ($\alpha = 0.95$ as a unidimensional ISEL scale / $\alpha = 0.79 - 0.89$ for each subscale) and also confirmed an adequate four-factor structure (Ghesquiere et al., 2017).

The Typical Beliefs Questionnaire (TBQ) is a reliable 25-item self-report scale that measure maladaptive thoughts that the individuals with CG can have (e.g. *You should have done something to prevent the death or make it easier.*) (Skritskaya et al., 2017). The level of agreement on each item is measured on a 5-point scale.

Global Impression-Improvement Scale (CGI) is a 7-point improvement rating scale (1=Very much improved - 7=Very much worse) widely used in clinical studies (Busner, Targum, & Miller, 2009; Guy, 1976). Treatment response, the main outcome variable of the CGTOA study, was measured using the Clinical Global Impression (CGI)-Improvement Scale at week 20 by clinicians. Those who received a rating of 1 (very much improved) or 2 (much improved) were considered to be treatment responders.

Analysis

Data analysis was conducted using the statistical software STATA 14 except for factor analysis, which used Mplus version 7 (Muthén & Muthén, 2010). The mean and SD for continuous variables and the frequencies and percentages for categorical variables were measured in order to describe baseline characteristics of the sample. T-test and ANOVA were used to examine bivariate relationships between hope and socio-demographic and bereavement-related variables. The endorsement rates of each item of the hope scale were examined using percentages.

The internal consistency of the THS was assessed using Cronbach's alpha. Cronbach's alpha of .70 and above is considered acceptable internal consistency, while .80 and above is considered good internal consistency (Nunnally, 1978). The convergent validity of THS was examined by computing correlation coefficients between THS and the following measures: Beck Depression Inventory (BDI) and the self-esteem construct from Interpersonal Support Evaluation List (ISEL). Similarly, the discriminant validity of the THS was examined by computing correlation coefficients between the THS and the following measures: Grief Related Avoidance Questionnaire (GRAQ), and Work and Social Adjustment Scale (WSAS). Statistical significance of the correlation coefficients was set at .05 alpha level (two-tailed).

Both confirmatory and exploratory factor analyses were employed in order to evaluate the structure of the THS among older adults with CG. Since the Trait Hope Scale (THS) is theoretically known to have two related but unique constructs, agency and pathways, with four corresponding variables for each construct (Snyder et al., 1991), confirmatory factor analysis (CFA) was conducted first to examine if the theoretically hypothesized two-factor model was identified in the CGTOA data. However, the current two-factor model did not fit the data well against the Hope Theory and the hypothesis of this study, and thus, exploratory factor analysis (EFA) was subsequently performed. Since hope scale items are rated on a categorical response scale (4-point likert scale), both CFA and EFA were conducted using robust weighted least squares mean and variance (WLSMV) adjusted estimation for categorical variables. For EFA only, geomin orthogonal rotation was also used. The goodness of model fit is generally examined taking several goodness of fit indices, not just one index into account (Kline, 2011). Therefore, in this study, the following goodness of fit indices were used to examine model fit: chi-square test of model fit (non-significant p value > .05), root mean square error of approximation

(RMSEA) (RMSEA < .05), comparative fit index (CFI) (CFI > .95), Tucker-Lewis index (TLI) (TLI > .95), and standardized root mean square residual (SRMR) (SRMR < .08). For interpretation of factor analysis results, items with factor loadings larger than .35 on only one factor are considered to be indicative of that factor. Lastly, for the sensitivity to change test used to evaluate if the THS has ability to measure clinically important changes during treatment (Liang, 2000), changes in hope score between week 1 and week 16 for treatment responders were compared to those of non-responders using a t-test.

Results

Descriptive Statistics

Table 1 shows that the mean age of the study sample is 65.8 (SD: 8.9) and approximately 47% of the sample is aged 65 and over. The majority of the sample are White (87%), female (81%) and college graduates (71.23%). 46.8% of the sample experiences complicated grief (CG) after the loss of spouse, and the rest are after the loss of parent (28.78%), child (17.27%) or friends and other relatives (7.19%). 13% of the sample reported a violent death of their loved one. The median of the time-since-loss is three years. Approximately 46% and 14% of the sample are diagnosed with major depressive disorder (MDD) and post-traumatic syndrome disorder (PTSD), respectively.

The bivariate statistics between hope, socio-demographic, and bereavement-related variables in Table 1 show that baseline hope score does not statistically differ by gender, race, education, marital status, or relationship to the deceased. Also, there was no significant difference in hope between those who are 65 and over (n=65) and those who are between 50 and 64 (n=74). Time-since-loss is not associated with the baseline hope score. Those who experienced a violent death showed a slightly higher hope score than those who did not

Table 1. Descriptive Data of Individuals with Complicated Grief (N=139)				
	% (n)	M (SD)	Hope Score M (SD)	Bivariate Statistics
Gender				
Female	81.29 (113)		19.8 (4.30)	t (137) = -0.359 p = 0.7203
Male	18.71 (26)		19.5 (3.35)	
Age (50 – 91)		65.75 (8.90)		
65 and over	46.76 (65)		19.88 (4.02)	t (137) = -0.305 p = 0.7607
50 – 64	53.24 (74)		19.66 (4.24)	
Race				
White	87.68 (121)		19.53 (4.12)	t (136) = 1.4968 p = 0.1368
All Other (African American, Asian, and American Indian)	12.32 (17)		21.12 (3.90)	
Education				
High school or less	10.07 (14)		18.57 (4.31)	F(2, 136) = 0.65 p = 0.526
Some College	18.71 (26)		19.88 (4.39)	
College and above	71.23 (99)		19.90 (4.04)	
Marital status				
Never married	17.99 (25)		20.08 (3.98)	F(3, 135) = 0.57 p = 0.6355
Married	19.42 (27)		20.56 (4.68)	
Separated/Divorced	15.83 (22)		19.41 (5.35)	
Widowed	46.76 (65)		19.43 (3.46)	
Time since loss (by year)		6.37 (8.64) 3 (median)		$\beta = 0.045$ p = 0.266
Person who is deceased				
Spouse/Partner	46.76 (65)		19.54 (3.69)	F(3, 135) = 0.31 p = 0.8204
Parent	28.78 (40)		19.63 (4.49)	
Child	17.27 (24)		20.38 (5.00)	
Relative or friend	7.19 (10)		20.30 (3.33)	
Violent death				
Yes	12.95 (18)		21.39 (4.33)	t (137) = -1.807 p = 0.0729
No	87.05 (121)		19.52 (4.06)	
Major Depressive Disorder				
Yes	46.76 (65)		18.49 (4.35)	t (137) = 3.541 p = 0.0005
No	53.24 (74)		20.88 (3.60)	
Post-Traumatic Syndrome Disorder				
Yes	14.39 (20)		21.05 (4.87)	t (137) = -1.515 p = 0.1320
No	85.61 (119)		19.55 (3.97)	
Hope (8 – 29)		19.76 (4.13)		

experience a violent death, but the difference ($p=0.07$) was not statistically different at the .05 alpha level. However, individuals with major depressive disorder (MDD) at baseline showed a significantly lower hope score than those without MDD, whereas there was no significant difference in hope score between those with or without post-traumatic syndrome disorder (PTSD).

The endorsement rates (see Table 2) show a wide range from 27.34% for item 2 (*I energetically pursue my goal.*) to 74.82% for item 10 (*I have been pretty successful in life.*). Study participants positively endorsed more pathways items (items 1, 4, 8) than agency items (items 10). More than or close to half of the study participants endorsed each item positively except item 2, which may indicate that many of the individuals in intense grief and sadness are able to keep their hope to some extent although we do not know whether their current level of hope is on the rise or decline in their grieving process.

Table 2. Item Endorsement Rates

Construct	Item	Definitely True (%)	Mostly True (%)	Mostly False (%)	Definitely False (%)	Definitely true + mostly true (%)	Definitely false + mostly false (%)
Agency	2. I energetically pursue my goals.	5.04	22.30	49.64	23.02	27.34	72.66
	9. My past experiences have prepared me well for my future.	7.91	37.41	35.25	19.42	45.32	54.68
	10. I have been pretty successful in life.	9.35	65.47	18.71	6.47	74.82	25.18
	12. I meet the goals that I set for myself.	2.88	41.73	45.32	10.07	44.60	55.40
Pathways	1. I can think of many ways to get out of a jam.	11.51	54.68	25.90	7.91	66.19	33.81
	4. There are lots of ways around any problem.	8.63	52.52	28.78	10.07	61.15	38.85
	6. I can think of many ways to get the things that are most important to me.	4.32	38.13	45.32	12.23	42.45	57.55
	8. Even when others get discouraged, I know I find a way to solve the problem.	5.76	50.36	35.97	7.91	56.12	43.88

Factor Structure

The results of confirmatory factor analysis (see Table 3) show that the hypothesized two-factor model does not fit the current data well, as only CFI indicates good fit but all the other fit statistics do not agree with the CFI result [$X^2(p) = 47.885 (.003)$, RMSEA = .105 (.068 - .142), CFI = .962, and TLI = .943]. Also, agency and pathways factors are very highly correlated with

each other ($r = 0.96$), which may indicate that each factor is not unique enough to explain the variance of the hope scale as Brouwer et al. (2008) argued in their study.

Table 3. Goodness-of-Fit Indices for the Trait Hope Scale

	Rotation	Estimator =WLSMV	df	X ² (p) p-value > .05	RMSEA (90% CI) < .05	CFI > .95	TLI > .95	SRMR < .08
CFA	NA		19	47.885 (0.0003)	0.105 (0.068 – 0.142)	0.962	0.943	NA
EFA	Geomin	One-factor	20	48.768* (0.0003)	0.102 (0.066 - 0.138)	0.962	0.947	0.061
		Two-factor	13	22.698* (0.0455)	0.073 (0.010 – 0.122)	0.987	0.972	0.039

Note: *p < .05

Table 4. Factor Loadings

Construct	Item	CFA	EFA		
		Correlation between Agency and Pathways factors: ($r = .96$)	One- factor	Two-factor	
				Factor 1	Factor 2
Agency	2. I energetically pursue my goals.	0.682	0.673*	0.852*	-0.003
	9. My past experiences have prepared me well for my future.	0.586	0.579*	0.000	0.603*
	10. I have been pretty successful in life.	0.676	0.668*	-0.055	0.748*
	12. I meet the goals that I set for myself.	0.756	0.744*	0.588*	0.267
Pathways	1. I can think of many ways to get out of a jam.	0.546	0.542*	0.240*	0.357*
	4. There are lots of ways around any problem.	0.716	0.711*	0.020*	0.726*
	6. I can think of many ways to get the things that are most important to me.	0.740	0.733*	0.268*	0.532*
	8. Even when others get discouraged, I know I find a way to solve the problem.	0.798	0.789*	-0.001	0.832*

Note: *p < .05

Since the current two-factor model does not fit the data well against the Hope Theory and the hypothesis of this study, exploratory factor analysis (EFA) was performed subsequently.

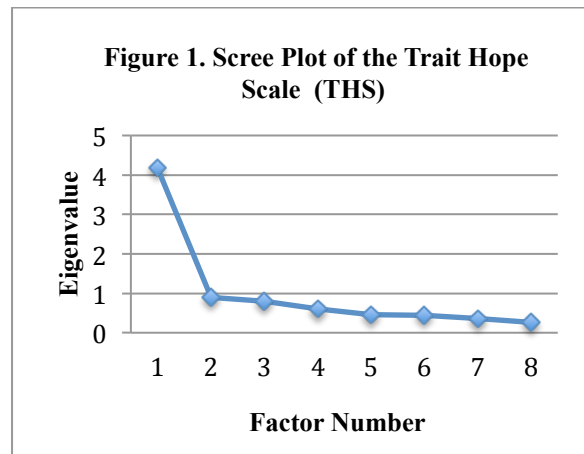
According to the eigenvalues of factors (see Table 5), there is only one factor (factor number 1)

with an eigenvalue higher than one (eigenvalue = 4.191) explaining 52% of the total variance of hope. Similarly, the curve of the scree plot (see Figure 1) indicated that the hope scale is likely to have one factor. However, given that factor number 2 has an eigenvalue close to 1 (eigenvalue = 0.89), which may indicate hope has a different two-factor structure from the two-factor structure that the Hope Theory supports, two factors were extracted for exploratory factor analysis (EFA).

The EFA results in Table 4 show that this two-factor structure which differs from the previously tested two-factor model, as two out of four agency items loaded on factor 1 but the other two agency variables loaded on factor 2 together with four pathways items. Specifically, the goodness of fit statistics of CFI, TLI and SRMR indicate this new two-factor model has a good fit and also a better fit than the one-factor model (see Table 3). RMSEA (RMSEA = 0.073) does not meet the standard of a good fit model, but on the other hand, is not an unacceptable fit. Though the p-value ($p = 0.0455$) of chi-square test is significant, its p-value barely meets the cutoff for statistical significance. Also, compared to a one-factor model, this new two-factor model has a much higher chi-square value than one factor model, indicating a better model fit. Taking all goodness of fit indices into account, the hope scale tested in the individuals with CG has a new two-factor structure, which is different from the theoretically hypothesized two-factor model.

Table 5. Eigenvalue

Factor Number	Eigenvalue	%	Cumulative Sum(%)
1	4.191	52.39%	52.39%
2	0.890	11.13%	63.51%
3	0.793	9.91%	73.43%
4	0.603	7.54%	80.96%
5	0.465	5.81%	86.78%
6	0.447	5.59%	92.36%
7	0.354	4.43%	96.79%
8	0.256	3.20%	99.99%
Total	7.999	99.99%	



Internal Consistency

The Chronbach's alpha of the 8 items of the Trait Hope Scale was .83, which indicates the THS has good internal consistency (see Table 6). The Chronbach's alphas for the subscales of the hope scale, agency and pathways, were .68 and .73 respectively. The agency subscale ($r = .68$) was slight below the acceptable reliability coefficient. However, the new two factors identified after the exploratory factor analysis (EFA) presents improved and acceptable level of reliability coefficients, .70 for new factor 1 (including only two original agency items) and .78 for new factor 2 (including two other agency items and all four pathways items).

	Hope (8 items)	Factor 1: Agency (4-item agency subscale)	Factor 2: Pathways (4-item pathways subscale)
Original two-factor model	0.83	0.68	0.73
	Hope (8 items)	New Factor 1 (2 items*: A2 and A12)	New Factor 2 (6 items*: A9, A10, P1, P4, P6, and P8)
New two-factor model after Exploratory Factor Analysis (EFA)	0.83	0.70	0.78

Note: *A stands for agency item and P stands for Pathways item.

Convergent and Discriminant Validity

Table 7 presents correlation coefficients between hope and CG symptoms and other CG-related measurements. As hypothesized, the THS score is highly correlated with the Beck Depression Inventory (BDI) ($r = -.64$) and the self-esteem support construct ($r = .65$) of the Interpersonal Support Evaluation List (ISEL) scores, which confirms convergent validity of the hope scale among the clinical sample with CG. When excluding item 2⁸ from the BDI, which

⁸ Beck Depression Inventory Item 2:

0. I am not particularly discouraged about the future.
1. I feel discouraged about the future.
2. I feel I have nothing to look forward to.
3. I feel that the future is hopeless and that things cannot improve.

asks about hopelessness about the future, the correlation between the hope score and depression still remained strong ($r = -.62$).

The THS is moderately correlated with two CG symptom scores ($r = -.35$ with SCI-CG and $r = -.30$ with ICG). In addition, a weak or moderate correlation were found between hope and the following CG-related symptoms measurements: Grief Related Avoidance Questionnaire (GRAQ) ($r = -.19$), Work and Social Adjustment Scale (WSAS) ($r = .44$), the Typical Beliefs Questions (TBQ) ($r = .38$) and the sub-constructs of Interpersonal Support Evaluation Measurement (ISEL) ($r = .28$ to $.39$) except for the self-esteem support construct. These results indicated adequate discriminant validity of the THS.

Table 7. Correlations of Trait Hope Scale with Measures of CG and CG-Related Symptoms

Measures	N	Pearson Correlation Coefficient	95% Confidence Interval	
ICG	133	-0.302*	[-0.449	-0.139]
SCI-CG	84	-0.348**	[-0.523	-0.144]
GRAQ	129	-0.188*	[-0.349	-0.015]
WSAS	137	-0.438***	[-0.564	-0.292]
TBQ	109	-0.383***	[-0.533	-0.210]
BDI	132	-0.639***	[-0.730	-0.526]
BDI (exclude item 2)	132	-0.619***	[-0.714	-0.501]
ISEL				
- Appraisal support	129	0.279**	[0.111	0.431]
- Tangible support	133	0.323**	[0.161	0.467]
- Self-esteem support	131	0.650***	[0.538	0.739]
- Belonging support	134	0.394***	[0.240	0.528]

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$
ICG - Inventory of Complicated Grief, **SCI-CG** – Structured Clinical Interview for Complicated Grief (31 items), **GRAQ** – Grief Related Avoidance Questionnaire, **WSAS** – Work and Social Adjustment Scale, **TBQ** – Typical Beliefs Questionnaire (25 items), **BDI** – Beck Depression Inventory, **ISEL** – Interpersonal Support Evaluation List

Sensitivity to Change with Treatment

The t-test results in Table 8 demonstrate that the THS is sensitive to the changes in complicated grief treatment outcome. Interestingly, both treatment responder and non-responder groups experienced a significant increase in hope score, 3.38 and 1.88 points increase

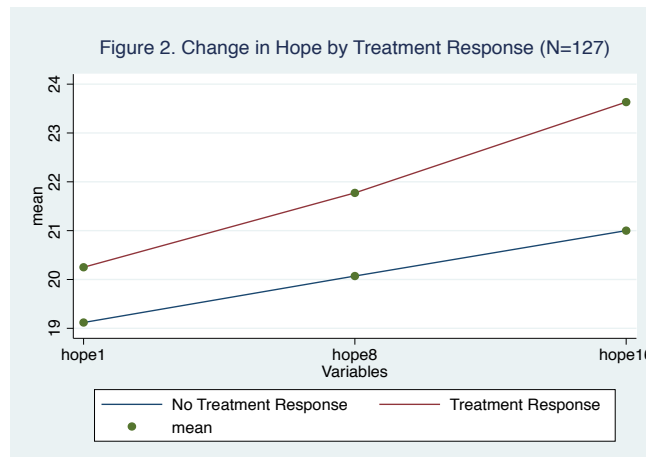
respectively, throughout the treatment. However, as this study hypothesized, the treatment responder group showed a significantly greater increase in hope score than the non-responder group during the treatment. The plot (see Figure 2) demonstrates that responder group experienced an increase in hope score between week 8 and week 16 (post-treatment) at a higher rate than between week 1 and week 8, whereas the non-responder group shows gradual increase throughout the treatment.

Table 8: Change in Hope Score by Treatment Response Status

Hope	Responders (N=68)			Non-Responders (N=59)			Compare the change between: Responders vs. Non-Responders	
	Pre (Week1) M (SD)	Post (Week16) M (SD)	Change: Post - Pre M (SD)	Pre (Week1) M (SD)	Post (Week16) M (SD)	Change: Post - Pre M (SD)	t (df)	p
1. Agency	4.65 (1.42)	5.5 (1.39)	0.85*** (1.18)	4.24 (1.19)	4.66 (1.25)	0.42** (1.05)	-2.153 (125)	0.033
2. Pathways	15.60 (3.20)	18.13 (3.40)	2.53*** (3.05)	14.88 (3.32)	16.34 (3.07)	1.46*** (2.47)	-2.154 (125)	0.033
Total Score	20.25 (4.28)	23.63 (4.50)	3.38*** (3.79)	19.12 (4.07)	21.00 (3.86)	1.88*** (3.01)	-2.443 (125)	0.016

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05

The t-test was conducted to examine (1) whether there was a significant change in hope score between pre- and post-treatment, and (2) whether the change in hope score among responders was significantly different from the change in hope score among non-responders. The sample size for the sensitivity test decreased to 127 because there were 11 people who did not complete the post-treatment hope assessment at week 16 and there is 1 person whose treatment response outcome is missing.



Discussion

The aim of this study was to examine the psychometric property of the Trait Hope Scale (THS), which had not been tested among the bereaved older adults with complicated grief (CG). This study specifically looked into factor structure, internal consistency, convergent and discriminant validity and sensitivity of the hope scale to the treatment outcome. As hypothesized, the findings of this study confirmed that overall the THS is a reliable and valid measure with evidence of good internal consistency ($\alpha = .83$), good convergent and discriminant validity, and is sensitive to the change in treatment outcome. However, new findings from the factor analysis of the THS, which did not agree with the two-factor model that the Hope Theory and many previous studies supported, require further studies to confirm its factor structure and the use of subscale of the hope scale, agency and pathways, in analysis.

According to the Hope Theory, the THS was developed to measure the individual's level of confidence in setting and achieving goals using the methods they created (Snyder et al., 1991). Theoretically, those with high hope, in other words a higher level of confidence in pursuing goals, are less likely to be depressed and more likely to have high self-esteem (Snyder et al., 1991). Therefore, this study posited that hope is highly (but not too highly) correlated with the Beck Depression Inventory (BDI) (Beck et al., 1988) and the self-esteem support subscale of Interpersonal Support Evaluation List (ISEL) (Cohen & Hoberman, 1983), which basically measures how individuals view themselves by comparing themselves to others. High, but not too high, correlations of hope with the BDI ($r = -.64$ with all 21 items / $r = -.62$ excluding BDI item 2) and the self-esteem support scale of ISEL ($r = .65$) confirmed adequate convergent validity of the hope scale. Also, discriminant validity was confirmed by a moderate or weak correlation with CG symptoms and other CG-related measures (see Table 7). These results show that the THS

may measure unique characteristics of hope that other theoretically-related measurements do not capture.

Findings of the current study also verified that the THS is sensitive to treatment response, which is a main outcome variable in the CGTOA data. Interestingly, both treatment responder and non-responder groups showed significant increase in hope score throughout the 16-week treatment. The increase of hope score among the non-responder group may be partially attributed to the fact that those who did not respond to treatment also have made small to moderate improvements in the severity of CG but not as much improvement as the treatment responders made. However, the treatment responder group showed a significantly higher increase in hope score than the non-responder group. This finding may indicate that the THS may be a clinically useful tool to measure hope as being sensitive to the change in treatment outcome.

While this study found evidence of good or acceptable internal consistency, convergent and discriminant validity, and sensitivity of the Trait Hope Scale (THS) for use among bereaved older adults with CG, the findings on the factor structure of the THS were somewhat puzzling as they were not consistent with Snyder's Hope theory and the findings of previous studies. Snyder's Hope theory and many of the previous studies have mainly either supported the two-factor structure of the hope scale with four items loading onto the agency factor and the other four items loading onto the pathways factor. However, the results of the confirmatory factor analysis (CFA) did not support a good model fit for the same two-factor model, and the very high correlation between agency and pathways factors ($r = .96$) suggested that agency and pathways constructs may not be so different from each other, which is not consistent with the hypothesis of Snyder's Hope theory (1991).

Interestingly, subsequent exploratory factor analysis (EFA) identified a new two-factor

structure with two original agency items loaded on Factor 1 (item 2 and item 12) and the other two agency items loaded onto Factor 2 (item 9 and items 10) with four pathways items altogether. Though eigenvalues and the corresponding scree plot show that the THS has a one-factor structure, this new two-factor model showed a better model fit than the one-factor model. The reduced factor correlation coefficient ($r = .64$) in this new two-factor model compared to the previous factor correlation coefficient between original agency and pathways, may indicate that this new two-factor model may be more adequate among the bereaved with CG than Snyder's original two-factor model.

The high factor loading of agency item 9 (.603) and item 10 (.748) onto this new Factor 2 (see Table 4) are also good evidence indicating these items are likely to measure the same common factor that the pathways items measure. The higher/improved reliability coefficient among 6 items (4 pathways items and 2 agency items) ($r = .78$) compared to the reliability coefficient with 4 pathways items ($r = .73$) (see Table 6) may also support the idea that agency items 9 and 10 are more correlated with pathways items than the other agency items. Then, why were items 9 and 10 loaded onto the same factor that the pathways items loaded onto instead of being loaded onto the agency factor with other agency items?

Items 9 and 10 of the hope scale asks individuals to assess their past and whether their past has prepared them to be ready for the future (item 9) or whether they have been successful in life (item 10), whereas the other two agency items ask goal-related questions such as *I energetically pursue my goals* (item 2) or *I meet the goals I set for myself* (item 12). These latter two items seem to have more face validity by directly asking the nature of agency, defined as how strongly they believe in their capacity to set goals and achieve them by Snyder et al. (1991), compared to items 9 and 10, which do not appear to be goal-setting or goal-achieving-related

questions. Rather, items 9 and 10 seem to be more relevant to pathways items as they ask the individual's perceived level of psychological and/or physical resources and capacities that could be used for their future success.

In their critique on the Hope theory, Aspinwall and Leaf (2002) argued that hope items should be contextualized in the future but many of the THS items do not ask about the future specifically and some of agency items measure the level of "self-regulatory competence" based on their past like pathways items (p.281).

Despite considering conceptual limitations of the Hope Theory and/or the THS, it is still unclear why the THS showed a different two-factor structure, whereas many of previous studies consistently identified the same two-factor structure that the Hope Theory hypothesized. The findings in this study may be due to certain characteristics of this particular clinical population experiencing CG and the methodological limitations of this study, as well as the limitations of the Hope Theory and hope scale themselves. Therefore, there should be further studies to confirm whether the findings are replicable in this particular clinical population, as well as general clinical samples. Also, theoretical reevaluation of the THS and modifications of the scale, if necessary, should follow. Meanwhile, scholars should take caution when it comes to use of separate subscales of agency and pathways in analysis, especially among the bereaved older adults with CG.

Limitations

To my knowledge, this study is the first to evaluate the Trait Hope Scale (THS) in individuals experiencing complicated grief (CG). The contribution of the study to the current knowledge on hope and CG is significant. However, this study also bears limitations that need to be taken into account when interpreting and applying the findings of the study to future research

and practice.

First, the sample of the study is a help-seeking sample of older adults with CG who voluntarily participated in a randomized controlled treatment study Complicated Grief Treatment in Older Adults (CGTOA) study. This means that the individuals in the sample may have been more motivated and/or more hopeful older adults than those who did not participate in the CGTOA study. Therefore, the findings of the study may not be generalizable to the non-treatment-seeking population and/or bereaved older adults who do not have CG symptoms. Also, participants of this study are highly educated and the majority is white and female. Therefore, the findings of the study may not be generalizable to a larger bereaved population with CG with a different racial and educational background.

Second, in CGTOA data, baseline data were collected at week 1 (after the first treatment session) while ICG was administered at both intake session and week 1. Therefore, data at week 1 were used as the baseline in the current study for consistency. As a result, it is possible that the first therapy session may have already influenced the level of hope of the study participants between pre-treatment and week 1 as well as the level of other key measures in this study.

Third, in this study sample, hope is highly correlated with depression measured by BDI ($r = -.64$). At baseline, 46% of the sample had clinically diagnosed major depressive disorder (MDD) and they showed significantly lower baseline hope compared to their counterparts without MDD. Therefore, the shared characteristics between hope and depression may have influenced the findings of study. Further studies on the relationship between hope and depression among CG population, especially a study that examines factor structure separately in CG patients 1) with MDD and 2) without MDD (which was not possible in this study due to small sample

size in each group when divided into two groups by MDD status), will be necessary to enhance our understanding of hope in CG.

Fourth, the THS employs a 4-point likert scale (*definitely false, mostly false, mostly true and definitely true*) without an anchor point between mostly false and mostly true, which may have not fully captured the variations in the level of hope. Therefore, it is possible that measurement errors may have influenced the findings of the study.

Lastly, a small sample size (N=139) of the study may have influenced findings of the factor analysis. The general rule of thumb in sample size for factor analysis is 10 people per variable of the scale being evaluated (Nunnally, 1978). The current study meets this minimum sample size, but in general, a large sample size is recommended for factor analysis.

Study Implications

Taking into account the limitations of the current study, further studies on psychometric evaluation of the Trait Hope Scale (THS) in a large sample with diverse socio-demographic backgrounds including a treatment-seeking and non-treatment-seeking bereaved group with complicated grief (CG) should follow to validate the findings of the current study and expand the current knowledge of hope and CG. Qualitative studies of hope among the bereaved older adults with CG will also expand our understanding of the role of hope and what it really means to those who are experiencing the intense grief and distress in their lives. Overall, the findings of the current study may suggest that the THS is a useful assessment tool of hope, which can be used among individuals with CG.

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Paper 3

**The Role of Hope in Complicated Grief Treatment Among Older Adults: Moderation and
Mediation Analysis**

Introduction

As hope has been recognized as one of the positive individual traits that can help individuals flourish (Seligman & Csikszentmihalyi, 2000), researchers have documented that hope is associated with better psychological adjustment outcomes, effective coping, and treatment outcomes (for a review, see Snyder, 2002). Intervention studies also showed that hope may be an important therapeutic component related to reduction of depression and PTSD symptoms (e.g. Gilman, Schumm, & Chard, 2012; Irving et al., 2004; Klausner et al., 1998). However, there is a lack of empirical studies that explores the positive impact of hope in bereavement, and none of the previous studies examined the relationship between hope and complicated grief.

Complicated grief (CG)⁹ is a mental health condition that occurs when the natural adaptation process to bereavement is hindered with intense grief complications such as maladaptive thoughts and rumination on the death of loved one, avoidance behaviors, and emotional dysregulation (Shear & Bloom, 2016; Shear et al., 2014). CG is characterized by a persistent and pervasive grief reaction such as persistent yearning for the deceased, preoccupation with the deceased, and intense emotional pain including sadness and guilt (ICD-11). Individuals with CG experience significant functional impairments in important domains of life including personal, social and work life. Studies found that CG is associated with increased risks of having suicidal ideation, substance use, sleep and cardiovascular problems (Shear, 2015). It is critical to provide clinical attention to the bereaved as complicated grief symptoms are likely to persist or improve slowly without clinical intervention (Shear, 2015). Approximately 10 to

⁹ Complicated grief is called “prolonged grief disorder” in the eleventh revision of International Classification of Diseases (ICD-11) and “persistent complex bereavement disorder” in the fifth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5).

20% of the bereaved who lose their spouse or partner experience CG and higher prevalence rates were reported among those who lose a child (Shear, 2015). CG is more prevalent in older adults who are more likely to experience the loss of a spouse or other loved ones compared to younger adults (Kersting, Brähler, Glaesmer, & Wagner, 2011).

Losing a loved one is one of the most stressful events in life. The bereaved may feel hopeless or less hopeful. However, hope can be restored through the coping process and hope in turn helps the individual to continue coping efforts against stress (Folkman, 2010). In a qualitative study, bereaved older adults described hope as “a gradual process to regaining inner strength and self-confidence to make sense of completely changed lives” (Holtslander & Duggleby, 2009, p.397). Then, what is the role of hope in CG, in which there is difficulty adapting to loss? Could hope or instilling hope have beneficial effects on relieving CG symptoms and facilitating adaptive processes after loss? As a first step in finding empirical evidence of the role of hope in CG, this study (Paper 3) will examine the role of hope in complicated grief treatment with a focus on testing hope as a possible moderator and/or mediator of complicated grief treatment effects using data from the Complicated Grief Treatment in Older Adults (CGTOA) study (Shear et al., 2014), which measured hope using Snyder’s Trait Hope Scale (Snyder et al., 1991).

Literature Review

Snyder’s Hope Theory

In scientific research, hope has been defined and conceptualized in various ways (Folkman, 2010; Lopez, Snyder, & Pedrotti, 2003). Schrank, Stanghellini, and Slade (2008) identified 49 different definitions of hope and 32 measurements of hope in their systematic review of hope research, which suggests that caution is required when interpreting and

comparing the findings of hope studies. Among the various definitions of hope, the Hope Theory proposed by Snyder and his colleagues (1991) has been widely studied and cited in the literature during the past two decades (Lopez et al., 2003).

According to the Hope Theory (Snyder et al., 1991), hope is “a positive motivational state that is based on an interactively derived sense of successful agency (goal-directed energy) and pathways (planning to meet goals)” (p.287). In other words, hope refers to an individual’s perceived ability to come up with pathways to reach their goals (pathways thinking) and to motivate themselves to use the pathways to achieve the goals (agency thinking). Though the Hope Theory views hope as primarily cognitive, Snyder et al. (1991) acknowledges that individuals experience positive or negative emotions based on their appraisals of whether they are achieving or making successful progress toward their goals (Snyder, Lehman, Kluck, & Monsson, 2006; Snyder, 2002). The Hope Theory posits that hope is associated with the individual’s appraisals and their coping process in stressful situations (Snyder et al., 1991). That is, individuals with higher hope are likely to be engaged in active coping efforts and appraise their stressful situations as challenging (rather than threatening) than those with lower hope (Snyder et al., 1991). Also, the Hope Theory posits that those with higher hope can think more flexibly so they can find other ways to achieve their goals when their current pathways do not work (Snyder, 2002).

Based on the Snyder’s Hope theory, two widely used hope scales for adults, the Trait Hope Scale (Snyder et al., 1991) and the State Hope Scale (Snyder et al., 1996), were developed. The Trait Hope Scale (THS) was designed to measure an individual’s relatively stable dispositional hope (e.g. “*I energetically pursue my goals*”), whereas the State Hope Scale (SHS) was designed to measure the state level hope specific to the current situation (e.g. “*At the present*

time, I am energetically pursuing my goals”) so it may be more sensitive to temporal changes during intervention. However, Paper 2 of this dissertation found that the THS is also sensitive to change with treatment, and previous studies showed that dispositional/trait hope also can change during intervention (e.g. Gilman et al., 2012; Shekarabi-Ahari, Younesi, Borjali, & Damavandi, 2012). Snyder et al. (1996) found that those with higher trait hope are more likely to have higher state level hope, and those with lower trait hope are more likely to have lower state level hope ($r = .78 - .79$).

The Impact of Hope on Psychological Outcomes

A sizable number of studies guided by Snyder’s Hope Theory have shown that hope is associated with and/or predicts positive physical and psychological adjustment outcomes across different domains of stressful situations (e.g. Barnum, Snyder, Rapoff, Mani, & Thompson, 1998; Chang & DeSimone, 2001; Horton & Wallander, 2001). For example, a study of adolescents who experienced a burn injury showed that higher hope is associated with better adjustment outcomes such as less external behavioral problems and higher self-worth (compared to a comparison group of children who did not experience such injury) (Barnum et al., 1998). Horton and Wallander (2001) found that hope is negatively associated with the level of distress among mothers of children with chronic physical disabilities, and hope moderates the impact of the mother’s perceived caregiving stress (relevant to raising a child with disabilities) on the level of distress. That is, when the caregiving stress level is high, mothers with high hope are significantly less distressed than mothers with low hope, but when the caregiving stress level is low, the level of distress is not different between mothers with high hope and those with low hope.

Studies with older adults consistently found a positive relationship between hope and psychological outcomes (e.g. Barnett, 2014; Ho, Ho, Bonanno, Chu, & Chan, 2010; Ong, Edwards, & Bergeman, 2006; Wroblewski & Snyder, 2005). Wroblewski and Snyder (2005) showed that older adults with higher hope are more likely to be satisfied with their lives and perceive better health than those with lower hope. In a longitudinal diary study, Ong et al. (2006) found that trait hope buffered the impact of stress on negative emotions and also facilitated a fast recovery from the negative effects of stress.

Positive Effects of Hope in Bereavement

Although there are a significant number of studies that documented the positive effects of hope on adjustment to stressful situations, there is a dearth of studies that examine the adaptive role of hope particularly in bereavement. However, they have pointed to hope as an important psychological energy and/or coping resource that may help the bereaved adjust to bereavement. Michael and Snyder (2005) investigated the role of hope in adjustment to bereavement among college students who experienced loss of a loved one (which was mostly a loss of friends and grandparents). The study found that hope predicts psychological outcomes such as depression, anxiety, positive emotion and negative emotion when rumination (Nolen-Hoeksema, 1991) is held constant. In a study conducted in Hong Kong, Chow (2010) looked at the relationship between hope and adjustment outcomes among those who lost either a parent or spouse in comparison to those who have not experienced loss of a loved one during the past two years. The author found that the bereaved group showed a significantly lower level of hope than the comparison group. Hope was negatively associated with depression and anxiety in both the bereaved and non-bereaved comparison groups. However, the negative associations between hope and depression and hope and anxiety were stronger among the bereaved, which indicates

the beneficial impact of hope on adjustment outcomes may be more significant during bereavement.

Hope in Psychotherapy and Complicated Grief Treatment (CGT)

Positive therapeutic effects of hope have been observed in intervention studies designed to increase hope defined as goal-directed hopeful thoughts according to Snyder et al. (1991) for different mental health conditions (e.g. Gilman et al., 2012; Irving et al., 2004; Klausner et al., 1998). For example, Klausner et al. (1998) conducted a treatment study among older adults who were diagnosed with major depressive disorder. A goal-focused group psychotherapy and reminiscence therapy developed by Butler (1974) were provided to treatment and control groups, respectively. Both treatment and control groups showed significant improvement in depressive symptoms and functional limitations. However, the goal-focused treatment group showed a larger improvement in depressive symptoms. Shekarabi-Ahari et al. (2012) conducted a 8-week group hope therapy which incorporated hopeful imagination, positive self-talk, and social connection. They found that hope therapy significantly increased the level of hope and decreased depressive symptoms of mothers of children with cancer compared to the control group with no treatment. A study among veterans who received a 6-week cognitive processing therapy also found that hope at mid-treatment significantly predicts reduction in depressive and PTSD symptoms post-treatment (but not the vice versa), even though the therapy did not specifically target hope (Gilman et al., 2012). Although the reviewed intervention studies are limited to depression and PTSD, empirical evidence of the positive role of hope in psychotherapies may suggest that hope (increase in hope) may also be significantly associated with treatment outcomes of complicated grief treatment (CGT).

CGT is a 16-session-long evidence-based treatment for complicated grief (CG) which employs various techniques from cognitive behavioral treatment for PTSD (Foa & Rothbaum, 2001), interpersonal psychotherapy (Weissman, Markowitz, & Klerman, 2000), and motivational interviewing (Miller & Rollnick, 2002) (Shear, 2010; Shear & Bloom, 2016). Through large-scale randomized controlled trials (e.g. Shear, Frank, Houck, & Reynolds, 2005; Shear et al., 2016; Shear et al., 2014), CGT has proved its distinctive effectiveness among existing treatments for CG compared to interpersonal psychotherapy (IPT) (Weissman et al., 2000), an evidence-based treatment for depression with a focus on interpersonal relationship issues including grief (for a review, see Mancini, Griffin, & Bonanno, 2012).

CGT is designed to help the bereaved adapt to loss using both a loss-focused (e.g., focus on acceptance of death, reduction of cognitive and behavioral avoidance, and improvement in emotion regulation) and restoration-focused approach (e.g., focus on aspirational goals work and encouraging social support) (Shear, 2015; Shear & Bloom, 2016). According to Bowlby (1980), fluctuation toward and away from emotional pain is a form of emotion regulation during bereavement, which helps adapt to loss. This also can be described as “confrontation and avoidance”, implying that the bereaved not only confronts loss-oriented stressors but also avoid these at times and confronts restoration-oriented stressors instead, which gives them a psychological break from loss-related intense emotional distress (Shear & Shair, 2005; Stroebe & Schut, 2010, p.279).

In CGT, aspirational goals work is used to encourage and motivate the bereaved to identify intrinsically motivated interests and values in order to develop personal life goal(s), and to develop plans to achieve the goals, in order to generate feelings of enthusiasm for their future even without the deceased (Shear, 2010; Shear & Bloom, 2016). In line with Snyder’s Hope

Theory, it is hypothesized that the bereaved are able to experience a sense of purpose and positive emotions such as interest and excitement through an aspirational goal-setting and planning process, which in turn facilitates their adjustment to loss (Shear, 2010; Shear & Bloom, 2016).

As reviewed, the current existing literature suggests beneficial effects of hope in adjustment to stressful situations including bereavement and increasing hope may be an important therapeutic component in mental health treatment. At the same time, it points to the lack of research on hope in the context of bereavement. The role of hope in CG and CGT is poorly understood, which suggests more studies in this field of bereavement research are required.

Therefore, the current study (Paper 3) will examine the role of hope in CGT. The specific aims of Paper 3 with their corresponding hypotheses follow:

Specific Aim 1: To examine changes in hope between pre- and post-treatment.

H_{1.1}: Both CGT and IPT will significantly increase the level of hope among participants during the treatment.

H_{1.2}: CGT will increase the level of hope significantly more than IPT does during the treatment.

Specific Aim 2: To test whether baseline hope moderates the relationship between treatment and treatment outcomes including treatment response, complicated grief symptoms (ICG), depressive symptoms (BDI), work and social adjustment (WSAS), and grief-related avoidance (GRAQ).

H₂: Baseline hope has moderating effects on the relationship between treatment and treatment outcomes. Specifically, the treatment effects of CGT over IPT will

be greater among those with lower baseline hope than those with higher baseline hope.

Specific Aim 3: To test the mediating effects of hope between treatment and treatment outcomes including treatment response, complicated grief symptoms (ICG), depressive symptoms (BDI), work and social adjustment (WSAS), and grief-related avoidance (GRAQ).

H₃: Increase in hope mediates treatment effects of CGT over IPT.

Methods

Data and Study Sample

This study used data from the Complicated Grief Treatment in Older Adults (CGTOA) study, a randomized clinical trial of complicated grief treatment (CGT) (Shear et al., 2014). CGT is an attachment theory-informed treatment specifically developed to target complicated grief (CG) symptoms in reaction to the low response of Interpersonal Psychotherapy (IPT) (Weissman et al., 2000), an evidence-based treatment for depression with a grief focus (Shear & Bloom, 2016). The CGTOA study tested treatment efficacy of CGT among older adults in comparison to IPT. Study participants were recruited from 2008 to 2013 within the New York metropolitan area (Shear et al., 2014). Participants¹⁰ are individuals who are 50 and above (77% are over the age of 60), have been bereaved for at least 6 months, and meet the criteria of CG. The criteria of CG are a score of 30 and above on the Inventory of Complicated Grief (ICG), a self-reported measure of CG, and confirmation of the CG on an expert clinical interview (see Shear et al., 2014 for inclusion and exclusion criteria). A total of 151 eligible participants were randomly assigned to either CGT (n=74) or IPT (n=77). Each group was offered 16 individual therapy sessions for a

¹⁰ The inclusion criteria include a score of 30 and above on the Inventory of Complicated Grief and confirmation of the presence of CG symptoms through a structured clinical interview for CG. Those who currently have a history of substance abuse disorder, bipolar I disorder, active suicidal ideation or psychotic disorder were excluded. Those who scored below 24 on Mini-Mental State Exam and were receiving other psychotherapies were also excluded.

16-20 week period. The sample of this current study (Paper 3) is limited to those who completed hope assessments at week 1 (baseline) and week 16 (post-treatment) (N=128).

Measures

Hope variable

Hope was measured by the Trait Hope Scale (THS) (Snyder et al., 1991) widely used to measure dispositional hope for adults (Brouwer, Meijer, Weekers, & Baneke, 2008). The THS is a 12-item self-reported measure, which consists of four agency-related items (e.g., *I energetically pursue my goals*), four pathway-related items (e.g., *I can think of many ways to get out of a jam*), and four distractor items, which do not count towards scoring. Each item is rated on a 4-point likert-type scale (1=Definitely false, 2=Mostly true, 3=Mostly false, 4=Definitely False). A total sum score of 8 items was used in data analysis. The THS has been extensively tested and has shown good or acceptable validity and reliability (Snyder, 2002). Also, Paper 2 of this dissertation, which examined psychometric properties of hope scale among individuals with CG, showed that overall the THS is a reliable and valid measure with evidence of good internal consistency ($\alpha = .83$), good convergent and discriminant validity, and its sensitivity to change with treatment.

Treatment outcome variables

Treatment response was measured by clinicians using the Clinical Global Impression-Improvement Scale (CGI) (Busner, Targum, & Miller, 2009; Guy, 1976). The CGI is a 7-point improvement rating scale (1=Very much improved - 7=Very much worse) widely used in clinical studies. Those who received a rating of 1 (very much improved) or 2 (much improved) were considered to be treatment responders. In the CGTOA study, CGI measured at week 20 was used as the treatment response outcome.

Complicated grief symptoms level was measured by the Inventory of Complicated Grief (ICG) (Prigerson et al., 1995). ICG is a 19-item self-reported measure of CG symptoms, which is one of the widely used measures of CG grief symptoms and demonstrates good validity and reliability.

Depressive symptoms level was measured by the Beck Depression Inventory (BDI) (Beck, Steer, & Carbin, 1988). BDI is a widely used 21-item self-report depression measure with good internal consistency ($\alpha = 0.76 - 0.95$ for clinical samples, $\alpha = 0.73 - 0.92$ for non-clinical samples) and validities for both clinical and non-clinical samples. Each item, including depression symptoms and attitudes such as sadness, guilty feeling, and suicidal ideation, is rated on a four-point response scale. One of the BDI item¹¹ asks for the respondent's level of discouragement (hopelessness) toward the future. In data analysis, both BDI with item#2 and BDI without item #2 were used in case this particular item is conceptually closely related to hope. However, data analysis results using BDI with item#2 were similar (was not significantly different) with those using BDI without item #2.

Grief-Related Avoidance was measured by the Grief Related Avoidance Questionnaire (GRAQ) (Shear et al., 2007). The GRAQ is a 15-item self-reported questionnaire that measures avoidance behaviors in activities that reminded the bereaved of the loss of their loved one (e.g. *Do you avoid places that are associated with the death?* and *Do you avoid rooms or places that you associate with the person who died?*). It has demonstrated good reliability ($\alpha = 0.78$ / ICC = 0.88) and validity among individuals with CG.

¹¹ BDI Item #2:

0. I am not particularly discouraged about the future.
1. I feel discouraged about the future.
2. I feel I have nothing to look forward to.
3. I feel that the future is hopeless and that things cannot improve.

Work and social adjustment level was measured by the Work and Social Adjustment Scale (WSAS) (Mundt, Marks, Shear, & Greist, 2002). WSAS is a valid and reliable five-item self-report measure ($\alpha = 0.70 - 0.94$ / $ICC = 0.73$) that rates the perceived level of impairment in work and social functioning due to grief (e.g. ability to work, home management, maintaining private and social leisure activities and maintaining social relationships). Each item is rated on an 8-point severity scale.

Analysis

All data analysis in this study was conducted using the statistical software STATA 14. For descriptive statistics, the t-test, chi-square test and ANOVA were used. The t-test was also used to examine whether there was a significant difference in the change of hope scores during the treatment (between baseline and week 16) between CGT and IPT groups, and whether the amount of change was statistically different between groups. Additionally, a linear mixed model was employed in order to measure the treatment effects on hope taking advantage of longitudinal data and in order to see if the results validate the results of t-test. In the model, subject ID (labeled as Reference ID in the CGTOA data) was included as a random factor and treatment group, time, baseline hope (at week 1), and PTSD status were included as fixed factors with an interaction term between treatment and time. Hope scores at week 8 and week 16 were used as the outcome.

Moderation analysis to examine hope as a possible moderator of treatment effects was conducted by adding an interaction term between baseline hope and treatment group into a regression model. Subsequently, treatment effects (CGT vs. IPT) were calculated at the 25th, 33rd, mean, 50th, 75th and 99th percentile of the hope score in order to better understand interaction effects and specifically test if treatment effects of CGT over IPT are greater among

those with lower baseline hope compared to those with higher baseline hope.

Mediating effects of hope on the relationship between treatment and treatment outcomes was tested using the mediation testing method by Baron and Kenny (1986). According to Baron and Kenny's four-step test for mediation (see Figure 3), the total effects of treatment on the outcome variables (Path A) and the effects of treatment on the mediator (Path B), which is hope in this study, should be significant. Also, mediator should be significantly associated with outcome variables when controlling for treatment (Path C). If the direct treatment effects on outcomes become either significantly reduced or non-significant after controlling for the mediator (Path D), this means that hope is a mediator in the relationship between treatment and treatment outcomes.

Results

The sample of this study is mainly female (82.8%), White (87.4%), and college graduates (71.88%). The mean age of the sample is 65.6 years old (SD: 8.71). 46% of the sample experienced complicated grief (CG) due to the loss of their spouse, and the rest experienced CG due to the loss of parents, children, relatives, or friends. As the data of current study is from a randomized controlled trial, both treatment (CGT) and control (IPT) groups are similar in terms of their baseline socio-demographic characteristics such as age, gender, and race excluding education ($p = 0.05$) (see Table 1). Also, there was no significant between-group difference in the baseline levels of CG symptoms (i.e. ICG) and other CG-related symptoms such as BDI, WSAS and GRAQ. Baseline hope score, which is a main variable of the current study, also does not differ by treatment groups. However, the PTSD status at baseline was significantly different between CGT and IPT groups with more individuals with PTSD in CGT group.

Table 1. Baseline Characteristics of Treatment (CGT) and Control (IPT) Groups (N=128)

	All (N=128)		CGT (n = 62)	IPT (n = 66)	Bivariate Statistics
	% (n) / M (SD)	Range	% (n) / M (SD)	% (n) / M (SD)	
Gender					
Female	82.81 (106)		83.87 (52)	81.82 (54)	X ² (1, N=128) = 0.095 p = 0.758
Male	17.19 (22)		16.13 (10)	18.18 (12)	
Age	65.62 (8.71)	50 – 91	65.37 (9.06)	65.85 (8.44)	t (126) = 0.309 p = 0.758
Race					
White	87.40 (111)		83.61(51)	90.91 (60)	X ² (1, N=127) = 1.535 p = 0.215
All other (African American, Asian, and American Indian)	12.60 (16)		16.39 (10)	9.09 (6)	
Education					
High school or less	9.38 (12)		4.84 (3)	13.64 (9)	X ² (3, N=128) = 7.83 p = 0.050
Some college	18.75 (24)		27.42 (17)	10.61 (7)	
College degree	16.41 (21)		14.52 (9)	18.18 (12)	
Graduate	55.47 (71)		53.23 (33)	57.58 (38)	
Marital status					
Never married	17.19 (22)		17.74 (11)	16.67 (11)	X ² (3, N=128) = 1.707 p = 0.635
Married	20.31 (26)		16.13 (10)	24.24 (16)	
Separated/Divorced	16.41 (21)		19.35 (12)	13.64 (9)	
Widowed	46.09 (59)		46.77 (29)	45.45 (30)	
Time since loss (by year)	2.90 (median)	0.49 – 45.25	3.28 (0.49 – 45.25)	2.65 (0.50 – 38.12)	z = -0.110 p = 0.912
Person who is deceased					
Spouse/Partner	46.09 (59)		41.94 (26)	50 (33)	X ² (3, N=128) = 3.272 p = 0.324
Parent	28.91 (37)		25.81 (16)	31.82 (21)	
Child	17.97 (23)		22.58 (14)	13.64 (9)	
Relative or friend	7.03 (9)		9.68 (6)	4.55 (3)	
Violent death					
Yes	14.06 (18)		16.13 (10)	12.12 (8)	X ² (1, N=128) = 0.425 p = 0.514
No	85.94 (110)		83.87 (52)	87.88 (58)	
MDD_current					
Yes	46.88 (60)		50 (31)	43.94 (29)	X ² (1, N=128) = 0.472 p = 0.492
No	53.12 (68)		50 (31)	56.06 (37)	
PTSD_current					
Yes	14.06 (18)		22.58 (14)	6.06 (4)	X ² (1, N=128) = 7.219 p = 0.007
No	85.94 (110)		77.42 (48)	93.94 (62)	
Panic disorder_current					
Yes	13.28 (17)		17.74 (11)	9.09 (6)	X ² (1, N=128) = 2.077 p = 0.149
No	86.72 (111)		82.26 (51)	90.91 (60)	
Hope	19.71 (4.19)	8 – 29	19.48 (4.39)	19.92 (4.02)	t (126) = 0.592 p = 0.554
Complicated grief symptoms level (ICG)	45.92 (9.41)	30 – 72	46.60 (9.22)	45.27 (9.62)	t (126) = -0.798 p = 0.427
Grief-related avoidance (GRAQ)	24.07 (13.63)	0 – 56	24.47 (12.99)	23.69 (14.29)	t (117) = -0.311 p = 0.757
Work and social adjustment (WSAS)	22.04 (10.34)	0 – 40	23.13 (10.63)	21.18 (10.16)	t (124) = -1.051 p = 0.295

Depression (BDI-21 items)	21.66 (8.82)	4 – 48	22.67 (9.54)	20.77 (8.10)	t (119) = -1.185 p = 0.238
Depression (BDI-20 items excluding item #2*)	20.22 (8.24)	4 – 45	21.26 (8.94)	19.28 (7.51)	t (119) = -1.325 p = 0.188

ICG - Inventory of Complicated Grief, **GRAQ** – Grief Related Avoidance Questionnaire, **WSAS** – Work and Social Adjustment Scale, **BDI** – Beck Depression Inventory.

*BDI Item #2:

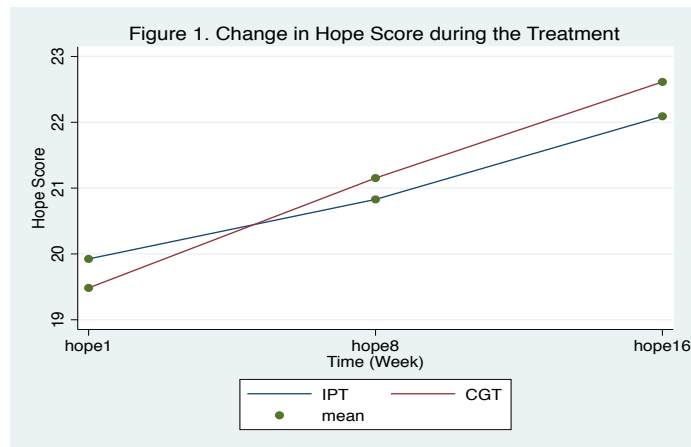
0. I am not particularly discouraged about the future.
1. I feel discouraged about the future.
2. I feel I have nothing to look forward to.
3. I feel that the future is hopeless and that things cannot improve.

Change in Hope During the Treatment

As hypothesized (see H_{1-1}), t-test results (see Table 2) showed that both CGT and IPT groups had a significant increase in hope score during the treatment by 3.13 points and 2.17 points, respectively. However, a one-point (approximately) difference in the change of hope score between CGT and IPT was not statistically significant ($p = 0.126$), which does not support the hypothesis (H_{1-2}) that CGT would have a significantly greater increase in hope score than IPT. Consistently, Figure 1, which plotted the mean of the hope score at each assessment time point during the treatment, shows a trend of steady increase in hope score in both CGT and IPT groups (although the slope for CGT is slightly steeper).

	CGT (n=62)			IPT (n=66)			Compare the change in hope during the treatment between CGT and IPT
	Baseline (Week1) M (SD)	Post-Treatment (Week16) M (SD)	Change within CGT:	Baseline (Week1) M (SD)	Post-Treatment (Week16) M (SD)	Change within IPT:	
Hope	19.50 (4.39)	22.61 (4.81)	Diff = 3.13*** t (61) = -6.040 p = 0.000	19.92 (4.02)	22.09 (4.11)	Diff = 2.17*** t (65) = -5.991 p = 0.000	Diff = -0.96 t (126) = -1.539 p = 0.126

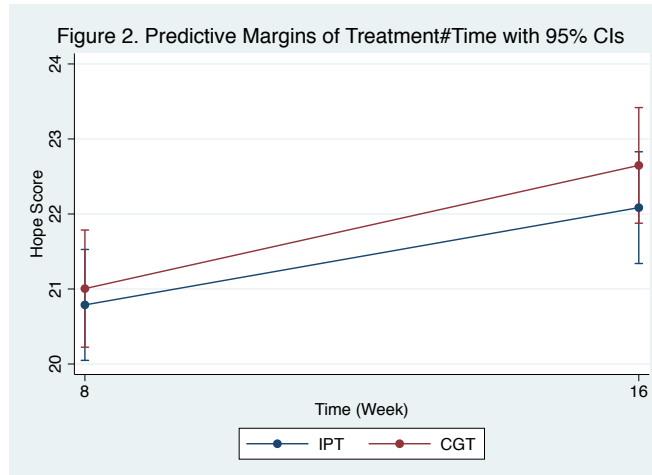
Note: *** p < 0.001, ** p < 0.01, * p < 0.05



The subsequent longitudinal analysis using a linear mixed model (with subject-level random intercept) (see Table 3) showed results similar to the t-test results in Table 2. According to Table 3, there were no significant interaction effects between treatment group and time ($\beta = 0.346$, $p = 0.534$) while adjusting for baseline hope score (at week 1) and PTSD status. In other words, the slope of regression line for CGT group is not significantly different from the slope of regression line for IPT group (see Figure 2). There was no significant difference in hope score between the CGT and IPT groups at week 16 (22.647 (CGT) vs. 22.084 (IPT), difference=0.563, $z = 1.02$, $p = 0.308$).

	β (SE)	p value
Treatment Group (1=CGT, 0=IPT)	0.217 (0.554)	0.695
Time	1.297 (0.385)***	0.001
Treatment Group x Time	0.346 (0.557)	0.534
Baseline Hope	0.716 (0.056)***	0.000
PTSD	1.208 (0.683)	0.077
Constant	6.469 (1.18)***	0.000

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$



Moderating Effects of Hope

This study hypothesized that treatment effects (of CGT over IPT) may differ depending on baseline hope score (H_2). Specifically, it was expected that treatment effects would be higher among those with a lower baseline hope score than those with a higher baseline hope score. The hypothesis was tested with the following five treatment outcomes: treatment response, complicated grief symptoms level (ICG), depressive symptoms (BDI), work and social adjustment (WSAS), and grief-related avoidance (GRAQ). Table 4 shows stepwise linear and logistic regression results of Model 1 and Model 2 for each outcome. Model 2 is the final model including an interaction term between treatment group and hope.

According to the results of Model 1 before adding the interaction term, CGT¹² showed significantly better post-treatment outcomes than IPT for treatment response status ($OR = 5.484$, $p = 0.000$), complicated grief symptoms level (ICG) ($\beta = -5.825$, $p = 0.002$), and work and social adjustment (WSAS) ($\beta = -3.662$, $p = 0.020$). However, the treatment effects of CGT were not significantly different from those of IPT for depressive symptoms (BDI) ($\beta = -1.307$, $p = 0.317$

¹² Since the sample of the current study (Paper 2) was limited to those who completed hope assessment at week 1 and week 16, the sample size of this study ($N=128$) is different from that of the CGTOA study ($N=151$). Therefore, the results of treatment effects in this paper can be different from those in the paper reporting the main outcomes of the CGTOA study. Please refer to the article by Shear et al. (2014) for the main outcomes of the CGTOA study.

for BDI-21 items, and $\beta = -1.146$, $p = 0.350$ for BDI-20 items) and grief-related avoidance level (GRAQ) ($\beta = -2.936$, $p = 0.069$). Baseline hope predicts only the grief-related avoidance outcome, but not the other treatment outcomes while adjusting for other variables (e.g. treatment group and PTSD). That is, a one point increase in baseline hope score is associated with a 0.438 point increase in grief-related avoidance level (increase in GRAQ means less improvement) ($\beta = 0.438$, $p = 0.027$). In Model 2, significant interaction effects were found only for the grief-related avoidance outcome ($\beta = 1.071$, $p = 0.006$) indicating treatment effects for the grief-related avoidance outcome are significantly different according to the level of baseline hope score.

Table 4. Moderation Analysis

	Treatment Response <i>OR(SE)</i>		ICG <i>β (SE)</i>		BDI-21 <i>β (SE)</i>		WSAS <i>β (SE)</i>		GRAQ <i>β (SE)</i>	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Hope (Baseline)	1.089 (0.053) p=0.077	1.127 (0.079) p=0.089	-0.113 (0.218) p=0.606	-0.350 (0.312) p=0.263	-0.170 (0.200) p=0.399	-0.233 (0.243) p=0.340	-0.024 (0.203) p=0.905	-0.280 (0.270) p=0.301	0.438* (0.196) p=0.027	-0.082 (0.265) p=0.757
Treatment Group	5.484*** (2.237) p=0.000	20.197 (39.970) p=0.129	-5.825** (1.846) p=0.002	-14.836 (8.642) p=0.089	-1.307 (1.301) p=0.317	-4.143 (6.270) p=0.510	-3.662* (1.556) p=0.020	-13.898 (7.306) p=0.060	-2.936 (1.597) p=0.069	-24.28** (7.761) p=0.002
Pre-treatment condition of outcome	NA	NA	0.774*** (0.096) p=0.000	0.769*** (0.096) p=0.000	0.572*** (0.094) p=0.000	0.579*** (0.095) p=0.000	0.530*** (0.082) p=0.000	0.539*** (0.082) p=0.000	0.692*** (0.059) p=0.000	0.714*** (0.057) p=0.000
Hope X Treatment Group	NA	0.935 (0.092) p=0.498	NA	0.461 (0.432) p=0.288	NA	0.144 (0.311) p=0.645	NA	0.522 (0.364) p=0.154	NA	1.071** (0.381) p=0.006
Observations	N=129	N=129	N=126	N=126	N=119	N=119	N=124	N=124	N=114	N=114
R-squared (Adjusted)	0.1476 (pseudo)	0.1502 (pseudo)	0.3785	0.3793	0.3904	0.3862	0.3144	0.3204	0.5545	0.5809

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

- The current PTSD status at baseline, which was not balanced between treatment (CGT) and control (IPT) groups after random assignment, has been controlled for in each model.

- Please see Table 4(a) in the appendix for the results of the BDI-20 items outcome, which are similar to those for the BDI-21 items outcome.

- The sample of Paper 3 is limited to those who completed hope assessments at week 1 and week 16 [N=128]. However, for moderation analysis, only baseline hope score was used, not the hope score at week 16, so those who completed hope assessment at week 1 but not week 16 were also included in the analysis.

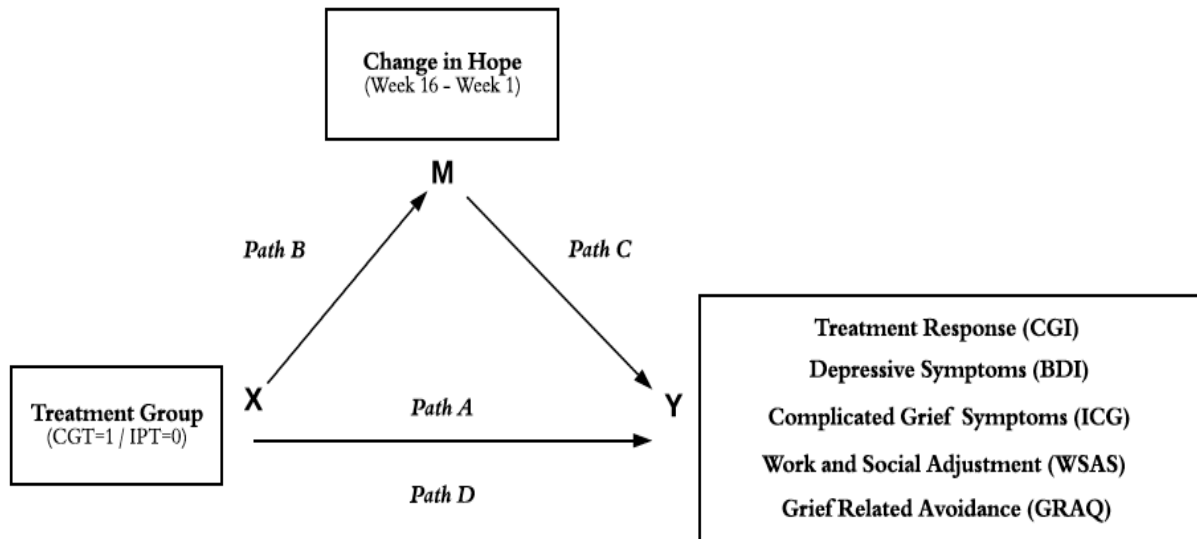
Baseline Hope Score		CGT vs. IPT	t statistic	95% Confidence Interval	
Percentile	Score	Coefficient (SE)			
25 th	17	-6.081** (1.912)	t = -3.18 p = 0.002	-9.871399	-2.291397
33 rd	18	-5.011** (1.717)	t = -2.92 p = 0.004	-8.413322	-1.608341
Mean	19.71	-3.180* (1.551)	t = -2.05 p = 0.043	-6.255801	-.1045238
50 th	20	-2.869 (1.550)	t = -1.85 p = 0.067	-5.940849	0.201452
75 th	23	0.342 (1.940)	t = 0.18 p = 0.860	-3.503501	4.187504
99 th	29	6.765 (3.788)	t = 1.79 p = 0.077	-0.7421898	14.27299

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05

Table 5 presents treatment effects of CGT over IPT ($= 1.071 * \text{Hope} - 24.281$) at different levels (e.g. lower (25th), medium (50th), and higher (75th)) of hope score to better understand the interaction effects between treatment group and hope for the grief-related avoidance outcome. According to Table 5, CGT is more effective in reducing the grief-related avoidance among those with relatively lower baseline hope (slight below the 50th percentile of hope score), whereas there were no significant treatment effects of CGT over IPT among those with relatively higher baseline hope (at the 50th percentile of hope score and above). Specifically, those with lower baseline hope (at the 25th percentile of hope score) in CGT group showed a 6.081 point larger reduction in post-treatment GRAQ score compared to the counterparts with the same level of hope in IPT group ($t = -3.18$, $p = 0.002$). Those with higher baseline hope (at the 75th percentile of hope score) in the CGT group showed a 0.342 point less reduction than the counterparts with the same level of hope in the IPT group. However, the 0.342 point difference was not statistically different ($t = 0.18$, $p = 0.860$), which means there were no significant treatment effects of CGT over IPT among those with higher baseline hope. These results indicate that those with lower baseline hope may benefit more from CGT compared to IPT, but not for

those with higher baseline hope, which partially supports the hypothesis of specific aim 2 (H₂) for the grief-related avoidance outcome.

Figure 3. Mediation Model



Mediation Analysis

Table 6 shows that there are significant treatment effects for outcomes such as treatment response, CG symptoms level, work and social adjustment, but not for depression and grief-related avoidance (Path A). However, treatment (CGT vs. IPT) was not significantly associated with change in hope score during the treatment (week 16 – week 1) (Path B). Since Path B is not significant, which already rules out the possibility that hope may be a mediator in the causal relationship between treatment and treatment outcomes, Paths C and D do not need to be analyzed (regardless, the results for Path C and Path D are shown in Table 6).

The hypothesis (H₃) that hope mediates the relationship between treatment and treatment outcomes was not supported. Also, separate secondary analysis using change in hope score during the first half (week 8 – week 1) and the second half (week 16 - week 8) showed similar

results - treatment is not significantly associated with the change in hope score during both the first and second half of treatment.

Table 6. Mediation Analysis

Outcomes	Treatment Response (Week 20) (N=127)	ICG (W0 – W20) (N=124)	BDI-21 (W1 – W16) (N=118)	BDI-20 (W1 – W16) (N=118)	WSAS (W1 -W20) (N=122)	GRAQ (W1 –W16) (N=114)
Path A (X → Y) : The total effects of treatment (X) on outcome (Y)	OR = 4.725*** SE = 1.872 p = 0.000	$\beta = 6.022^{***}$ SE = 1.889 p = 0.002	$\beta = 2.007$ SE = 1.43 p = 0.164	$\beta = 1.904$ SE = 1.347 p = 0.160	$\beta = 4.413^*$ SE = 1.803 p = 0.016	$\beta = 3.141$ SE = 1.832 p = 0.089
Path B (X → M) : The effects of treatment (X) on the change in hope (M)	$\beta = 0.895$ SE = 0.638 p = 0.163	$\beta = 0.974$ SE = 0.651 p = 0.137	$\beta = 0.343$ SE = 0.649 p = 0.598	$\beta = 0.343$ SE = 0.649 p = 0.598	$\beta = 0.985$ SE = 0.659 p = 0.138	$\beta = 0.540$ SE = 0.668 p = 0.420
Path C (M → Y) : The effects of the change in hope (M) on outcomes (Y) when controlling for treatment (X)	OR = 1.111 SE = 0.068 p = 0.087	$\beta = 1.142^{***}$ SE = 0.243 p = 0.000	$\beta = 1.160^{***}$ SE = 0.176 p = 0.000	$\beta = 1.092^{***}$ SE = 0.165 p = 0.000	$\beta = 0.907^{***}$ SE = 0.238 p = 0.000	$\beta = 1.127^{***}$ SE = 0.239 p = 0.000
Path D (X → Y) : The effects of treatment (X) on outcomes when controlling for the change in hope (M)	OR = 4.514*** SE = 1.822 p = 0.000	$\beta = 4.910^{**}$ SE = 1.760 p = 0.006	$\beta = 1.609$ SE = 1.225 p = 0.192	$\beta = 1.530$ SE = 1.152 p = 0.187	$\beta = 3.520^*$ SE = 1.724 p = 0.043	$\beta = 2.533$ SE = 1.683 p = 0.135

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05

- The current PTSD status at baseline, which was not balanced between treatment (CGT) and control (IPT) groups after random assignment, has been controlled for in each model.

- In the mediation analysis, the change in each treatment outcome, except for treatment response, between pre- and post-treatment was used as the outcome.

Discussion

The aim of the current study (Paper 3) was to examine the role of hope in complicated grief treatment (CGT) with a focus on testing hope as a possible moderator and/or mediator of treatment effects. The study found that the hope score significantly increased during the treatment in both CGT and IPT groups. CGT group showed a slightly higher increase in hope score than the IPT group but the between-group difference was not statistically significant (see Table 2 and 3). This indicates that hope may not be a mediator of treatment effects of CGT over IPT. Subsequent mediation analysis clearly confirmed that hope is not a mediator of treatment effects for outcomes such as treatment response, CG symptoms level, depressive symptoms,

work and social adjustment, and grief-related avoidance (see Table 6). However, significant moderating effects of baseline hope score on treatment effects was found for the grief-related avoidance outcome, which indicates that those with lower baseline hope score may benefit more from CGT than IPT.

The non-significant between-group difference in hope score may be attributed to the fact that IPT is an evidence-based treatment originally developed for depression (Weissman et al., 2000) and depression is significantly correlated with the trait hope score (Snyder et al., 1991). Especially, in the current study sample, hope is highly correlated with depressive symptoms measured by the Beck Depression Inventory (BDI) ($r = -0.639$, see Table 7 of Paper 2). Therefore, IPT may have been particularly effective (as much as CGT) for increasing hope score as well as reducing depressive symptoms. Similarly, in the paper by Shear et al. (2014) reporting the main outcomes of the CGTOA study, depressive symptoms measured by the BDI was not statistically different between CGT and IPT after treatment, while CGT showed significantly greater improvements in other outcomes, including significantly higher treatment response rates and a greater reduction in CG symptoms level compared to IPT. The current finding suggests that hope is not a mediator of treatment effects, which explains how CGT works better than IPT. However, increase in hope may be a positive sign of improvement in CG-related symptoms in both CGT and IPT (or it could be possible that hope may be a mediator in both CGT and IPT), as the hope score significantly increases during treatment in both groups (CGT and IPT) and treatment responders showed a greater increase in their hope scores than those who did not respond to treatment (see Paper 2).

In general, low hope is often considered a risk factor of poor health and treatment outcomes. However, this study found more favorable treatment effects of CGT over IPT in

reducing grief-related avoidance among those with relatively lower baseline hope, but not among those with relatively higher baseline hope. Avoiding certain situations or activities that remind the bereaved of the deceased is one of the key symptoms of CG, and avoidance behaviors are significantly associated with impairments in social and work functioning (Shear et al., 2007; Shear, 2015). CGT is designed to help individuals with CG confront grief-related avoidance behaviors, whereas IPT does not have a particular focus on reducing grief-related avoidance behaviors (Shear, 2015). According to Snyder (2002), individuals with low hope are likely to use avoidance coping (e.g. avoidance thinking and behaviors) when they face obstacles in their goal pursuit, whereas individuals with high hope are likely to find other ways to reach their goals. Therefore, it is possible that the more structured approach of CGT to have the individuals with CG face reminders of the deceased gradually (Shear & Bloom, 2016) may have helped those with lower hope, who may have a harder time facing situations which remind them of their loss, compared to those with higher hope. A recent study by Glickman, Shear, and Wall (2017) found that grief-related avoidance is a mediator of treatment effects of CGT for the outcomes of treatment response, CG symptoms (ICG), and work and social adjustment. These results are promising for those with lower baseline hope, as their baseline hope may not hinder them from taking advantage of CGT and CGT may help them particularly reduce grief-related avoidance behaviors, which mediates treatment effects.

Limitations

This study has several limitations, which should be taken into account when interpreting the results of the study. First, the sample of this study is help-seeking older adults with CG who voluntarily participated in the Complicated Grief Treatment in Older Adults (CGTOA) study. Also, study participants are predominantly white and female, and the majority of the sample

received college education (Shear et al., 2014). Therefore, the findings of the study may not be generalizable to a larger bereaved population with CG with a diverse racial and educational background or non-treatment seeking individuals with CG. The study findings also may not be extended to a larger male population with CG.

Second, baseline data in the CGTOA study were collected at week 1 (after the first treatment session) except for CG symptoms (ICG) which was measured at both intake session and week 1. As a result, it is possible that the first therapy session may have already influenced key variables of the current study between pre-treatment and week 1. In addition, post-treatment data for hope, depressive symptoms and grief-related avoidance were collected at week 16, whereas post-treatment data for treatment response, CG symptoms, and work and social adjustment were measured at week 20 when the main treatment outcome of the CGTOA study, treatment response, was determined. Therefore, the use of data collected at week 1 and week 16 may have underestimated the actual changes in hope, depressive symptoms, and grief-related avoidance scores during the treatment.

Third, the use of THS may not have substantially captured the temporal and situation-specific (i.e., hopeful thoughts specifically related to loss and grief) changes of hope score during treatment, even though the current study found that the trait hope increased significantly in both CGT and IPT groups during treatment. Therefore, future studies, which measure state level hope specifically in the context of loss and grief as well as trait level hope may provide more information of the role of hope in CGT.

Lastly, the scope of literature review and findings in this study should be interpreted and understood within the Hope Theory by Snyder et al. (1991). Considering hope has been conceptualized in various ways and that there are many different measures of hope used in

previous studies (Lopez et al., 2003), we should be cautious when comparing the findings of this study with other studies that used other measures and theories to assess hope.

Study Implications

The findings of the current study suggest that hope may not be a mediator of treatment effects of CGT over IPT. However, a significant increase in both CGT and IPT and a greater increase in hope among treatment responders compared to non-responders in both treatments may indicate that regaining hope may be an important factor associated with the resolution of CG symptoms. Therefore, further studies that examine potential mediating effects of hope in both CGT and IPT compared to the no-treatment control group are warranted.

The finding of this study that CGT is better particularly for those with lower level baseline hope in reducing grief-related avoidance compared to IPT adds to the existing empirical evidence indicating CGT is a more effective treatment for CG than IPT. It is important for practitioners to know which interventions work for a specific subpopulation (Kraemer, Wilson, Fairburn, & Agras, 2002) because they are the ones who can provide treatment or inform the clients about treatment options and help them make decisions. Assessing baseline hope of clients before treatment may provide useful information to better assist clients make a treatment decision. At the same time, further studies on why those with lower baseline hope benefit more from CGT compared to IPT may provide more insight into understanding the mechanism of CGT and optimizing current treatment.

Qualitative studies which examine the experience of hope including how they define hope and what makes the bereaved with CG hopeful before, during, and after the treatment will provide valuable information in understanding the role of hope in CG.

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Appendix

Table 4 (a). Moderation Analysis Results for BDI-21 and BDI-20

	BDI-21 items		BDI-20 items	
	β (SE)		β (SE)	
	Model 1	Model2	Model 1	Model2
Hope (Baseline)	-0.170 (0.200) p = 0.399	-0.233 (0.243) p = 0.340	-0.171 (0.184) p = 0.354	-0.231 (0.224) p = 0.303
Treatment Group	-1.307 (1.301) p = 0.317	-4.143 (6.270) p = 0.510	-1.146 (1.220) p = 0.350	-3.900 (5.889) p = 0.509
Pre-treatment condition of outcome variable	0.572*** (0.094) p = 0.000	0.579*** (0.095) p = 0.000	0.560*** (0.092) p = 0.000	0.567*** (0.094) p = 0.000
Hope (baseline) X Treatment Group	NA	0.144 (0.311) p = 0.645	NA	0.139 (0.292) p = 0.634
Observations	N = 119	N = 119	N = 119	N = 119
R-squared (Adjusted)	0.3904	0.3862	0.3807	0.3765

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05

The current PTSD status at baseline, which was not balanced between treatment (CGT) and control (IPT) groups after random assignment, has been controlled for in each model.