Report of empirical study

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Personality, negative social exchanges, and physical health among bereaved adults

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Abstract

While much research has investigated the association between personality and health, little research has done so using a bereaved sample. Additionally, little research has investigated how personality influences the frequency of negative social exchanges bereaved individuals receive. This study utilized a structural equation model to investigate the associations among age, gender, personality, negative social exchanges, length of bereavement, and self-reported physical health in a sample of bereaved adults. Results indicated that personality was associated with negative social exchanges and physical health. Therefore, these variables are important and should be studied further in this context.

Keywords

bereavement, negative social exchanges, personality, physical health

Introduction

Considerable research has investigated the association between personality and physical health (see Hampson and Friedman, 2008). However, very little research has investigated this association in a bereaved sample. It is imperative to extend this line of research to include bereaved samples because (a) bereavement can negatively impact health (Stroebe et al., 2007), (b) personality influences how individuals cope with stressors (Carver and Connor-Smith, 2010), (c) personality influences how individuals recall and describe their bereavement experiences (Baddeley and Singer, 2008), and (d) personality influences who seeks out social support when experiencing stressors (Connor-Smith and Flachsbart, 2007). Although some research suggests that social support may be a buffer against the negative outcomes associated with bereavement, other studies have not found support for these associations (Lund et al., 2010; Stroebe et al., 2005). It is possible that these studies have failed to take into account negative social exchanges, which are aversive exchanges individuals receive from members of their social network (Brooks and Dunkel Schetter, 2011), that have been shown to negatively influence physical health (Hill et al., 2014; Newsom et al., 2005). Thus, this study focused on whether the association between personality and physical health among non-bereaved samples could be replicated within a bereaved sample and whether negative social exchanges might be associated with self-reported health in the sample.

Bereavement and health

Bereaved individuals have an increased risk of morbidity and mortality (Jones et al., 2010; Stroebe et al., 2001b, 2007), especially within the first few months after the death of a loved one (Roelfs et al., 2012). These increased risks are the result of bereaved individuals' grief, which is the reaction to the death of a loved one. These reactions can include psychological and physiological components, which may increase vulnerability to premature death through increased susceptibility to disease or suicide (Roelfs et al., 2012; Stroebe et al., 2001a, 2007).

Research has found that bereaved individuals perceive their health to be poorer than their same-aged non-bereaved counterparts (Stroebe et al., 2007). They report somatic complaints more frequently, exhibit increased use of

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medical services, experience disability at higher rates, begin new and increase current medication use, and are hospitalized more often than their non-bereaved counterparts. They are also 1.4 times more likely to report a new or worsened illness affecting the endocrine, immune, cardiovascular, gastrointestinal, or musculoskeletal systems (Gerra et al., 2003; Stroebe et al., 2007).

While much of the above research has emphasized the negative outcomes associated with bereavement, it is important to note that research has found great variability (e.g. Boerner et al., 2005; Bonanno, 2004; Newson et al., 2011). Although bereavement can have a strong negative impact on individuals, there are many individuals who endure this potentially stressful experience quite well, showing little or no response. Given this variability, research has focused on identifying resources or factors that might differentiate between those individuals who adjust well after the death of a loved one and those who do not. One potentially fruitful area is the association between personality and bereavement.

Personality, grief, and coping styles

Personality is the enduring thoughts, feelings, and emotions that are specific to the individual. Personality can be defined in many ways; however, the most prominent trait theory in personality is the five-factor model (Lodi-Smith et al., 2011), which organizes personality into five superfactor models: neuroticism, conscientiousness, extraversion, agreeableness, and openness to experience. Research indicates that personality influences the intensity of grief individuals' experience. Specifically, bereaved mothers who were higher in neuroticism reported higher levels of grief intensity (i.e. higher levels of emotional and physical distress; Robinson and Marwit, 2006). Furthermore, bereaved parents who were higher in neuroticism reported higher levels of grief (Wijngaards-de Meij et al., 2007).

Personality also influences the types of coping styles individuals engage in when experiencing a stressor. Individuals who are higher in neuroticism report engaging in not only less task-oriented coping (i.e. attempting to change the stressful situation) but also more avoidance-oriented coping (i.e. seeking out distractions) and problematic emotion-oriented coping (i.e. minimizing the distress by expressing negative emotions; Connor-Smith and Flachsbart, 2007; Robinson and Marwit, 2006). Individuals who are higher in extraversion report engaging in more task-oriented coping and avoidance-oriented coping, while they also report engaging in less emotion-oriented coping (Connor-Smith and Flachsbart, 2007; Robinson and Marwit, 2006). Individuals who are higher in conscientiousness report engaging in more task-oriented coping (Connor-Smith and Flachsbart, 2007). Research indicates that personality has a stronger influence on coping styles as the stressor becomes more acute (Connor-Smith and Flachsbart, 2007). Thus, personality plays an influential role when it comes to how individuals cope with stressors, especially a stressor such as the death of a loved one.

Personality and health

In addition to coping styles, personality influences physical health. There are many theoretical models that describe the mechanisms that account for the association between personality and health (Smith, 2006). One influential theoretical model is the health behavior model, which states that individuals who endorse higher levels of specific personality traits do or do not engage in specific health-promoting or health-risk behaviors, which can lead to illness. The following paragraphs attempt to condense this abundant literature (see Friedman and Kern, 2014; Hampson and Friedman, 2008; Kern and Friedman, 2011 for a detailed discussion of personality and health).

Studies that have examined conscientiousness effects on health have found consistent results in which higher levels of conscientiousness are beneficial to health (Kern and Friedman, 2011). Specifically, individuals who are higher in conscientiousness engage in fewer health-risk behaviors (e.g. alcohol use, tobacco use, other substance use, and risky driving) while they engage in more health-promoting behaviors (e.g. physical activity, healthy eating, and wellness maintenance such as visiting a doctor) relative to those lower in conscientiousness (Atherton et al., 2014; Bogg and Roberts, 2004; Lodi-Smith et al., 2010). As such, individuals who are higher in conscientiousness have fewer physical limitations (Goodwin and Friedman, 2006).

Neuroticism exhibits a strong negative association with physical health (Taga et al., 2009). Individuals who are higher in neuroticism engage in health-risk behaviors, such as alcohol or tobacco use. These individuals also engage in fewer health-promoting behaviors compared to those lower in neuroticism (Berg et al., 2007; Turiano et al., 2012). Thus, individuals who are higher in neuroticism experience more physical limitations, report more medical problems, and report poorer general health (Atherton et al., 2014; Goodwin and Friedman, 2006; Jerram and Coleman, 1999).

Research has found a positive association between agreeableness and self-reported physical health (Atherton et al., 2014; Jerram and Coleman, 1999). Individuals who are higher in agreeableness report better general health, better physical functioning, and fewer medical problems relative to those lower in agreeableness (Atherton et al., 2014; Jerram and Coleman, 1999). Gender has been found to moderate the association between agreeableness and self-reported physical health: agreeableness may be a stronger predictor of physical health for males, while neuroticism may be a stronger predictor for females (Friedman et al., 2010).

Extraversion has shown mixed results in the literature. Individuals who are higher in extraversion engage in more health-promoting behaviors relative to those who are lower in

extraversion (Atherton et al., 2014; Jerram and Coleman, 1999). They also report better physical functioning and general health. However, individuals who are higher in extraversion are more likely to engage in substance use (Atherton et al., 2014).

Openness to experience has been the least studied trait with regard to health (Taga et al., 2009), and when included in research, results are mixed (Eldesousky, 2013; Goodwin and Friedman, 2006). Higher levels of openness to experience have been associated with better self-reported physical functioning and perceived general health (Jerram and Coleman, 1999). However, when paired with higher levels of neuroticism and lower levels of conscientiousness, higher levels of openness to experience have been associated with tobacco and illegal drug use (Turiano et al., 2012).

Personality, bereavement, and social support

In addition to health, personality influences how bereaved individuals describe their experiences with bereavement. While examining bereavement narratives, Baddeley and Singer (2008) found that bereaved individuals who were higher in conscientiousness told shorter stories and made more references to death relative to individuals who were lower in conscientiousness. Bereaved individuals who were higher in neuroticism were more likely to reference themselves in their stories. Thus, personality influences how bereaved individuals recall and share their experiences, which may influence the frequency and amount of social support bereaved individuals receive. In fact, research has suggested that individuals who were higher in extraversion were more likely to share their bereavement narratives to get closer to someone or to gain comfort or support from others (Baddeley and Singer, 2008; Connor-Smith and Flachsbart, 2007).

With regard to social support, there is a long-held assumption that it is an important tool in overcoming grief; however, there is limited empirical support for this assumption. While some research suggests that social support buffers against depressed moods and maintain positive moods among bereaved individuals (e.g. Lund et al., 2010; Van der Houwen et al., 2010), other studies have found limited evidence for this. Krause (1986) found that social support was associated with a decrease in somatic symptoms but it was not associated with sadness or loneliness. Other studies also have found little or no evidence for this position among a variety of samples (e.g. Murphy, 1988; Murphy et al., 2002; Stroebe et al., 1996). It is possible that these studies failed to account for the dark side of social support, specifically, negative social exchanges.

Negative social exchanges, health, and personality

Research indicates that relationships and exchanges among members of the social network are not uniformly positive (Chogahara, 1999; Rook, 1984). Social network members may not help when called upon or may engage in behaviors that they perceive to be helpful, but are not. These exchanges, which are termed negative social exchanges, have been shown to be conceptually and empirically distinct from social support or positive social exchanges (Okun and Keith, 1998). They consist of the undesirable and aversive exchanges individuals receive from members of their social network and include neglect, interference, rejection, conflict, insensitivity, and unwanted advice (Brooks and Dunkel Schetter, 2011; Newsom et al., 2005; Rook, 1998).

Research indicates that negative social exchanges negatively influence health. Strain from the social network (i.e. negative social exchanges from partner, family, or friends) has been associated with health problems (Walen and Lachman, 2000), while it also accounted for the greatest amount of variance in physical symptoms when compared to daily hassles, social support, and life events (Edwards et al., 2001). Recent analyses from the Health and Retirement Study demonstrate that negative social exchanges from friends and family are particularly powerful predictors of the onset of new chronic health conditions (Hill et al., 2014). The association between negative social exchanges and physical health is also evident in longitudinal studies. Newsom et al. (2008) examined participants' self-rated health, functional limitations, health conditions, and frequency of negative social exchanges experienced over the course of 2 years. Results indicated that increases in negative social exchanges were associated with poorer self-rated health after controlling for baseline self-rated health, race, gender, age, education, and income. Also, increases in negative social exchanges were associated with more health conditions after controlling for baseline health conditions, race, gender, age, education, and income. Thus, negative social exchanges influence physical health above and beyond influential variables.

Research suggests that individual characteristics influence the frequency with which individuals experience negative social exchanges. Research indicates that females are more likely to report and experience negative social exchanges due to the social roles they endorse (e.g. being more relationship-oriented) compared to men (Beals and Rook, 2006; Edwards et al., 2001). In addition, theory suggests that negative social exchanges should decrease with age. According to the socioemotional selectivity theory, older adults prune negative social network members from their networks (Carstensen, 1992), thus reducing the frequency they experience negative social exchanges.

It is important to understand whether other individual characteristics, such as personality, influence the frequency with which individuals experience negative social exchanges. Research conducted by Caspi et al. (1987) indicates that individuals' behavior predisposes them to environments that reinforces the behaviors (i.e. cumulative continuity) and that these behaviors also elicit responses

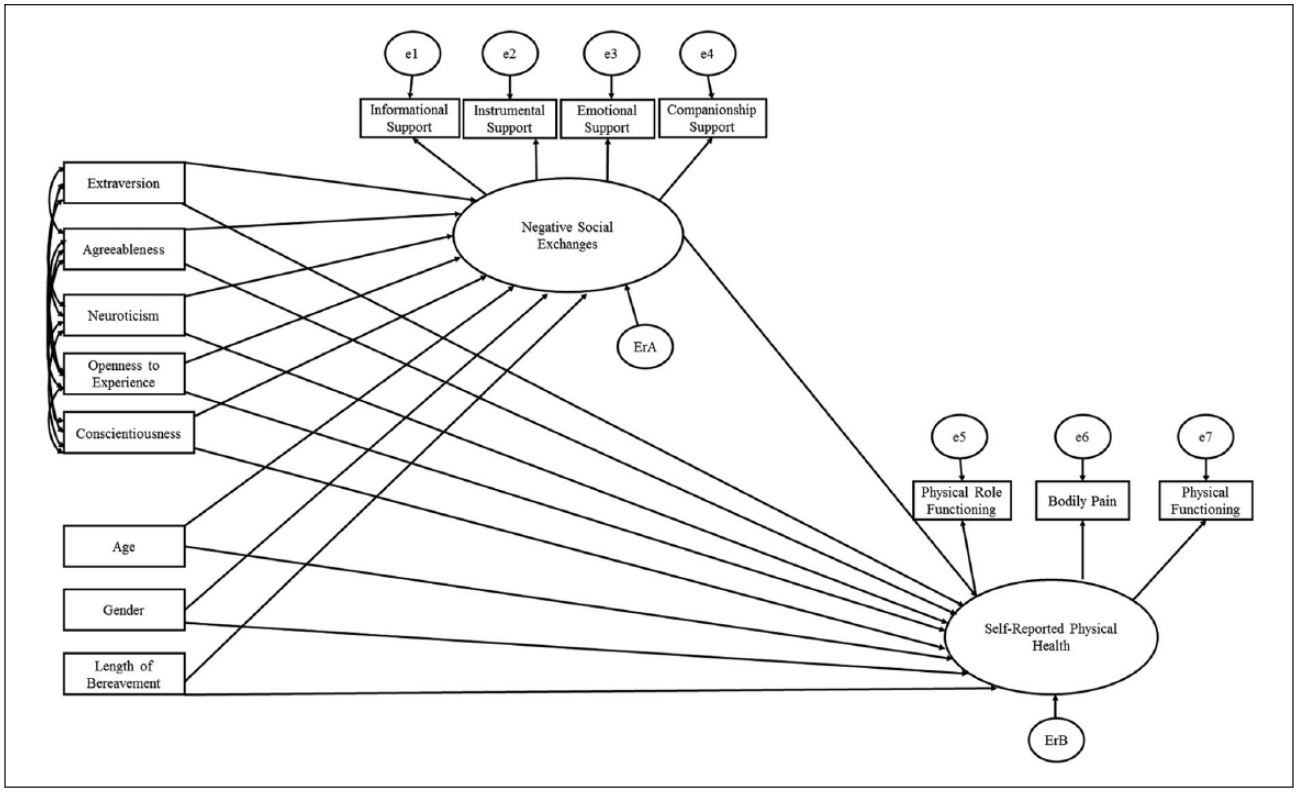

Figure 1. Tested structural equation model.

from the social network members, in which further elicits behaviors from the individuals (i.e. interactional continuity). As such, it is possible that individuals who are higher or lower on certain personality traits are more likely to elicit negative social exchanges from their social network in comparison with individuals who are not higher or lower on those traits. It is also possible that individuals place themselves in environments that strengthen their personality characteristics, which increases or decreases the negative social exchanges they receive.

However, the association between personality and negative social exchanges has not been examined in detail. Results from a limited number of studies indicate that individuals who are higher in neuroticism or extraversion experience more interpersonal conflicts with friends and spouses (Asendorpf and Wilpers, 1998; Bolger and Zuckerman, 1995; Iveniuk et al., 2014; Parker et al., 2012; Sturaro et al., 2008). Furthermore, individuals who are higher in neuroticism are more likely to respond to those conflicts with anger (Bolger and Zuckerman, 1995). In comparison, individuals who are higher in conscientiousness, agreeableness, or emotional stability (i.e. lower in neuroticism) report experiencing lower levels of conflict with their parents and friends (Neyer and Lehnart, 2007; Parker et al., 2012; Sturaro et al., 2008). In addition, it is thought that individuals who are higher in openness experience a reduction in conflict (McCrae and Sutin, 2009). Thus, it is important to examine whether personality is associated with negative social exchanges in a bereaved sample as these individuals may be in great need of and be in frequent contact with their social networks.

The current study

Due to the unique circumstances surrounding bereavement as discussed previously (e.g. bereavement negatively impacting health), this study was conducted to examine whether the association between personality and physical health could be replicated within a bereaved sample. Furthermore, this study was conducted to examine whether personality influences the frequency with which bereaved individuals report experiencing negative social exchanges and whether these exchanges influence self-reported physical health in a sample of 783 bereaved adults.

Hypotheses

Within a structural equation model (see Figure 1), this study examined the (a) association between personality and self-reported physical health; (b) association between personality and negative social exchanges; (c) association between negative social exchanges and self-reported physical health; (d) associations among length of bereavement, age, and gender with negative social

exchanges; (e) associations among length of bereavement, age, and gender with self-reported physical health.

Based on the previous literature, it was hypothesized that (a) neuroticism, age, and negative social exchanges would be negatively associated with self-reported physical health; (b) conscientiousness, agreeableness, and length of bereavement would be positively associated with self-reported physical health; (c) neuroticism, extraversion, and being female would be positively associated with negative social exchanges; and (d) conscientiousness, agreeableness, and age would be negatively associated with negative social exchanges.

Method

Participants

Participants were recruited using Amazon Mechanical Turk, an online survey tool. Research has shown that recruiting participants from Amazon Mechanical Turk is similar to other online and convenience sampling methods (Paolacci et al., 2010). Participants received US$2 for completing the questionnaire, which was approved by the Institutional Review Board. In order to detect response sets and other survey-taking concerns, participants were required to correctly answer three out of four validity check questions. These checks consisted of directions such as "For this question, please answer some or little of the time," which were placed throughout the questionnaire. Participants who did not answer the majority of the validity checks correctly were excluded from the analyses.

Initially, 980 participants completed the survey. In all, 56 participants were excluded as a result of failing the validity check questions, 1 was excluded as a result of response setting, 42 were excluded due to never having experienced bereavement, while 86 participants were removed due to excessive (30+%) missing data. An additional 12 participants were excluded due to being multivariate outliers.

Thus, our final sample included 783 participants between the ages of 18 and 82 (M age = 32.55, standard deviation (SD) = 11.59) years. Of these participants, 445 (56.8%) were female. Most of the participants self-identified as Caucasian (77.1%), although 8.4 percent were African American or Black, 6.4 percent were Asian–Pacific Islander, 5.2 percent were Hispanic, 2.4 percent reported other racial affiliations, and 0.4 percent did not specify a race. Additional sample characteristics are given in Table 1. Participants reported experiencing the death of grandparents (19.4%), parents (8.6%), friends (8.2%), aunts or uncles (5.4%), siblings (2.8%), cousins (1.7%), grandchildren (1.5%), spouses or partners (1.2%), in-laws (0.9%), children (0.5%), and nieces or nephews (0.5%), while 49.3 percent of the sample did not indicate their relationship to the deceased person. Additional bereavement characteristics are given in Table 2.

Table 1. Participant characteristics (N = 783).

	N (%)
Education	
Some high school	4 (0.5)
High school/GED	144 (18.4)
Some college/associate's degree	266 (34.0)
Bachelor's degree	277 (35.4)
Master's degree	79 (10.1)
Doctorate degree	10 (1.3)
Difficulty with paying the bills	
No difficulty	217 (27.7)
A little difficulty	301 (38.4)
Some difficulty	116 (14.8)
A great deal of difficulty	148 (18.9)
Marital status	
Single, never married	410 (52.4)
Married	266 (34.0)
Divorced	72 (9.2)
Separated	14 (1.8)
Widowed	17 (2.2)

GED: General Educational Development.

Table 2. Bereavement characteristics.

	N (%)
Length of bereavement (months)	
0–2	55 (7.0)
2–6	82 (10.5)
7–12	111 (14.2)
13–18	81 (10.3)
19–24	68 (8.7)
25+	386 (49.3)
Cause of death	
Prolonged illness/natural cause	250 (31.9)
Sudden health condition	73 (9.3)
Accident	36 (4.6)
Alcohol/drugs	7 (0.9)
Murdered or killed	9 (1.1)
Medical procedure	4 (0.5)
Suicide	14 (1.8)
Missing data	390 (49.9)
Relationship satisfaction with deceased	
1 (highly dissatisfied)	6 (0.8)
2	18 (2.3)
3	30 (3.8)
4 (neutral)	27 (3.4)
5	77 (9.8)
6	122 (15.6)
7 (highly satisfied)	113 (14.4)
Missing data	390 (49.8)

Measures

Demographics. Participants indicated their age, gender, highest level of education, ethnicity, marital status,

socioeconomic status, when they became bereaved, their relationship to the deceased individual, the cause of death, and their relationship satisfaction with the deceased individual.

The Midlife Development Inventory Personality Scales. Participants indicated how well 30 adjectives (e.g. organized, forceful, and calm) described themselves (Lachman and Weaver, 1997). These adjectives correspond to the personality traits of agency (five items, $\alpha = .76$), neuroticism (four items, $\alpha = .77$), extraversion (five items, $\alpha = .81$), openness to experience (seven items, $\alpha = .81$), conscientiousness (four items, $\alpha = .74$), and agreeableness (five items, $\alpha = .86$). Because we were interested in the five-factor model, agency was not included in the analyses. Responses to the adjectives could range from 1 (*a lot*) to 4 (*not at all*). Personality traits were scored by reverse coding responses when applicable and averaging the responses in which a higher score reflects greater endorsement of the personality trait.

Physical health. Subscales of the Short Form 12 (SF-12; Ware et al., 1996) were used to index self-reported physical health. The two-item physical role functioning scale ($\alpha = .77$), the one-item bodily pain scale, and the two-item physical functioning subscale ($\alpha = .71$) were included in the analyses.

Negative social exchanges. Participants indicated how often they experienced four different types of negative social exchanges in the past year. Responses could range from 1 (*never*) to 5 (*very often*) and included receiving unwanted advice (i.e. informational negative social exchange), being let down when help was needed (i.e. instrumental negative social exchange), being forgotten or ignored (i.e. companionship negative social exchange), and experiencing criticism about personal concerns (i.e. emotional negative social exchange).

Analytic strategy

In order to test the associations shown in Figure 1, our preliminary strategy included examining the patterns of correlations (see Table 3). Next, we used AMOS to simultaneously test the measurement and structural models. For the measurement model, two latent variables were created, which were labeled negative social exchanges and self-reported physical health. Four indicators (i.e. informational, instrumental, companionship, and emotional negative social exchanges) were used for the latent variable of negative social exchanges while three indicators (i.e. physical role functioning, bodily pain, and physical functioning) were used for the latent variable of self-reported physical health. Once the structural equation model was analyzed, multigroup analyses were conducted to test whether the associations among the variables differed for males and females and whether it differed for individuals who were recently bereaved (i.e. experienced bereavement less than 2 years) and those who were not recently bereaved (i.e. experienced bereavement more than 2 years) due to differential effects of gender and length of bereavement in previous literature (e.g. Friedman et al., 2010; Roelfs et al., 2012).

Results

The measurement model and structural equation model shown in Figure 1 were tested simultaneously using full information maximum likelihood estimation. Results indicated an adequate fit to the data, $\chi^2(71) = 241.23$, $p < .001$, $R^2 = .229$, the discrepancy function (CMIN/df) = 3.39, Comparative Fit Index (CFI) = .951, root mean square error of approximation (RMSEA) = .055. Personality, age, gender, and length of bereavement accounted for 15.7 percent of the variance in negative social exchanges, while personality, age, gender, length of bereavement, and negative social exchanges accounted for 22.9 percent of the variance in self-reported physical health (see Figure 2 and Table 4).

Results indicated that individuals who were female ($\beta = .15$), those higher in openness to experience ($\beta = .09$), and those higher in neuroticism ($\beta = .29$) reported more negative social exchanges, while individuals who were older ($\beta = -.07$) and those higher in conscientiousness ($\beta = -.12$) reported fewer negative social exchanges. Agreeableness, extraversion, and length of bereavement were not significantly associated with negative social exchanges.

Results also indicated that individuals who were older ($\beta = -.31$), those higher in agreeableness ($\beta = -.12$), and those higher in neuroticism ($\beta = -.15$) reported poorer physical health, while individuals who were higher in conscientiousness ($\beta = .11$) reported better physical health. Furthermore, individuals who reported more negative social exchanges ($\beta = -.23$) reported poorer physical health. Openness to experience, extraversion, length of bereavement, and gender were not associated with self-reported physical health. Indirect effects were examined, and results indicated that negative social exchanges did not mediate the association between personality and self-reported physical health.

Next, we examined whether the strength of these associations were equivalent across men and women. We conducted multigroup analyses, using gender as the grouping variable. Personality, length of bereavement, and age accounted for 12.8 percent of the variance in negative social exchanges for females and 18.4 percent of the variance in negative social exchanges for males. Personality, length of bereavement, age, and negative social exchanges accounted for 19.7 percent of the variance in self-reported physical health for females and 26.3 percent of the variance in self-reported physical health for males. The structural weights

Table 3. Variable descriptives and bivariate correlations.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age (M = 32.55, SD = 11.59)	–														
2. Gender (male = 0, female = 1)	.13**	–													
3. Length of bereavement	.10	.00	–												
4. Neuroticism (M = 2.24, SD = 0.71)	−.09	.10	−.01	–											
5. Extraversion (M = 2.81, SD = 0.66)	.05	.01	−.05	−.39**	–										
6. Open to experience (M = 3.05, SD = 0.58)	−.04	.05	−.03	−.18**	.52**	–									
7. Agreeableness (M = 3.35, SD = 0.61)	.09	.20**	−.03	−.18**	.53**	.49**	–								
8. Conscientiousness (M = 3.20, SD = 0.62)	.21**	.17**	.01	−.31*	.35**	.32**	.39**	–							
9. Informational NSE (M = 2.91, SD = 0.84)	−.07	.07	−.03	.20**	−.04	.02	.00	−.11	–						
10. Instrumental NSE (M = 2.82, SD = 1.00)	−.08	.13**	−.08	.26**	−.07	.00	−.02	−.12*	.45**	–					
11. Emotional NSE (M = 2.76, SD = 1.05)	−.15*	.13**	−.04	.31**	−.12*	.00	−.03	−.16**	.45**	.65**	–				
12. Companionship NSE (M = 2.71, SD = 1.04)	−.10	.12*	−.08	.28**	−.14**	−.03	−.05	−.16**	.39**	.66**	.71**	–			
13. Physical role functioning (M = 80.33, SD = 35.70)	−.17**	−.10	.01	−.19*	.06	.05	−.03	.07	−.13**	−.20**	−.18**	−.19**	–		
14. Bodily pain (M = 86.14, SD = 20.97)	−.15**	−.10	.12*	−.19**	.04	.04	−.07	.04	−.16**	−.20**	−.16**	−.18**	.59**	–	
15. Physical functioning (M = 87.19, SD = 22.96)	−.26**	−.17*	−.02	−.17**	.11	.08	−.05	.09	−.11	−.16**	−.14**	−.13**	.62**	.56**	–

NSE: negative social exchanges; SD: standard deviation.
Due to the large sample size, only significance levels of $p = .001$ and $p < .001$ are marked as significant.
*$p = .001$; **$p < .001$.

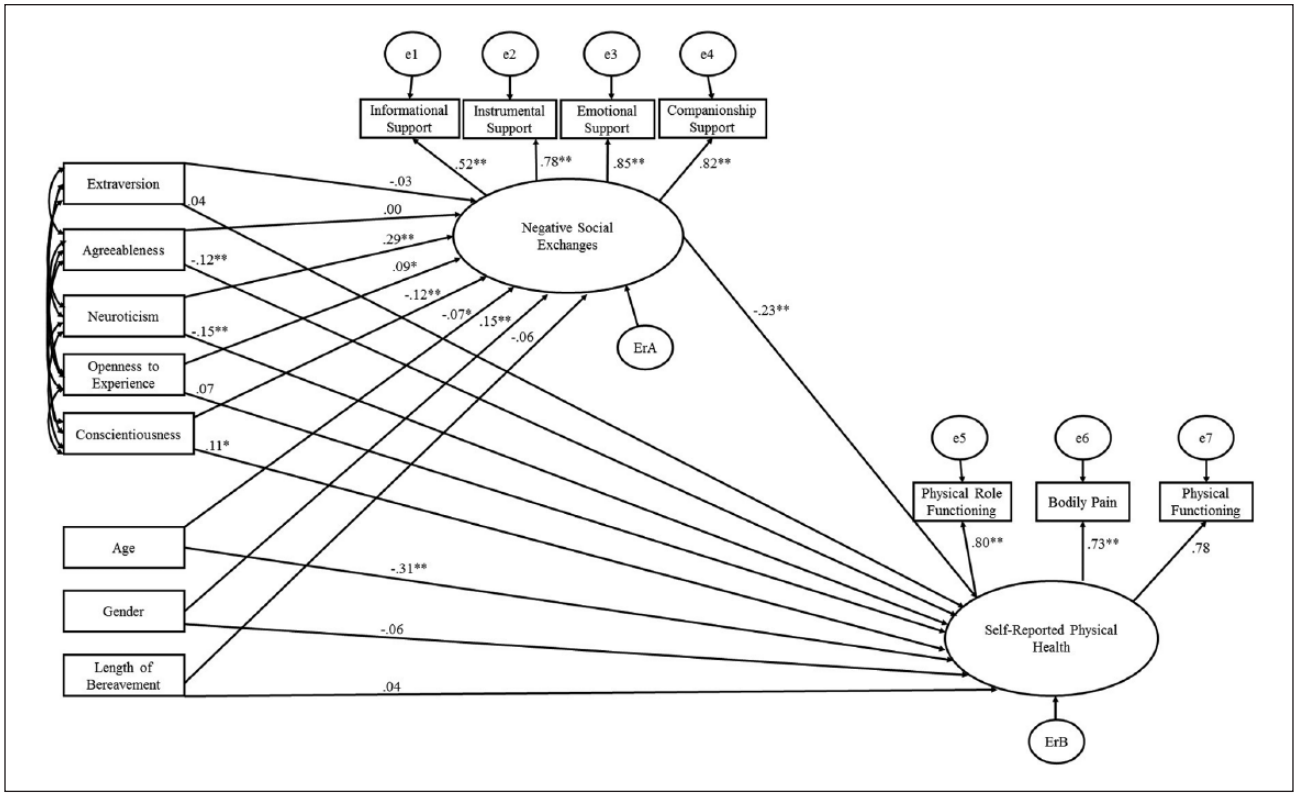

Figure 2. Structural equation model: $\chi^2(71) = 241.23$, $p < .001$, CMIN/DF = 3.39, CFI = .951, RMSEA = .055, $R^2 = .229$. Standardized betas are reported.
*$p < .05$; **$p < .001$.

for males and females did not significantly differ (model comparison: $\chi^2(20) = 24.27$, $p > .05$; see Supplemental Tables 1 and 2 [available at: http://hpo.sagepub.com/]).

Next, we examined whether the strength of these associations was equivalent across participants who were recently bereaved (i.e. experienced bereavement less than 2 years) and those who were not recently bereaved (i.e. experienced bereavement more than 2 years). We conducted multigroup analyses, using length of bereavement as the grouping variable. Personality, gender, and age accounted for 13.1 percent of the variance in those recently bereaved and 18.8 percent of the variance in those not recently bereaved. Personality, gender, age, and negative social exchanges accounted for 27.7 percent of the variance in self-reported physical health for those recently bereaved and 20.1 percent of the variance in self-reported physical health for those not recently bereaved. The structural weights for males and females did significantly differ (model comparison: $\chi^2(12) = 24.35$, $p < .05$; see Tables 5 and 6).

Discussion

While the association between personality and physical health has been the frequent topics of the study (Hampson and Friedman, 2008), little is known regarding whether the association can be replicated among bereaved individuals. It is important to examine whether the association is maintained given research indicating that bereavement negatively influences physical health (e.g. Stroebe et al., 2007). In addition, it is important to examine whether bereaved individuals' personality influences the types of interactions they receive from members of their social network given the fact that bereaved individuals may have more contact with their network after the death of a loved one. Thus, this study was designed to determine whether personality influenced the frequency of negative social exchanges and self-reported physical health in a bereaved sample.

Self-reported physical health

In our bereaved sample, findings regarding the association between personality and self-reported physical health were somewhat similar to those found using non-bereaved samples. Based on prior research (e.g. Atherton et al., 2014; Berg et al., 2007; Jerram and Coleman, 1999), it was hypothesized that neuroticism would be negatively associated with self-reported physical health, while conscientiousness and agreeableness would be positively associated with self-reported physical health. Our

Table 4. Measurement and structural equation model found in Figure 2.

	R^2	*b*	β	*SE*	*CR*
Measurement model					
Negative social exchanges					
Informational		1.00	.52		
Instrumental		1.78	.78**	0.12	14.23
Emotional		2.01	.85**	0.13	14.66
Companionship		1.95	.82**	0.13	14.54
Self-reported physical health					
Physical functioning		1.00	.78		
Physical role functioning		1.58	.80**	0.08	19.79
Bodily pain		0.85	.73**	0.04	18.86
Structural equation model					
Negative social exchange	.157				
Agreeableness		0.00	.00	0.03	−0.04
Openness to experience		0.07	.09*	0.03	2.10
Neuroticism		0.18	.29**	0.02	6.76
Extraversion		−0.02	−.03	0.03	−0.63
Conscientiousness		−0.08	−.12*	0.02	−2.95
Age		0.00	−.07*	0.00	−2.17
Length of bereavement		−0.01	−.06	0.00	−1.82
Gender		0.13	.15**	0.03	4.16
Self-reported physical health	.229				
Agreeableness		−4.58	−.12**	1.34	−3.40
Openness to experience		2.05	.07	1.38	1.48
Neuroticism		−3.85	−.15**	1.06	−3.62
Extraversion		0.94	.04	1.31	0.71
Conscientiousness		3.08	.11*	1.19	2.58
Age		−0.48	−.31**	0.05	−8.28
Length of bereavement		0.40	.04	0.37	1.06
Gender		−2.34	−.06	1.32	−1.76
Negative social exchanges		−9.23	−.23**	1.84	−5.01

SE: standard error; *CR*: critical ratio.
Gender: male = 0, female = 1.
*$p < .05$; **$p < .001$.

predictions regarding neuroticism and conscientiousness were supported; however, our findings contradicted previous research with regard to agreeableness and physical health. Perhaps, our bereaved individuals who were higher in agreeableness were also more open, cooperative regarding how they felt, or more likely to conform to unhealthy social pressure, which could lead to poorer self-reported physical health.

Based on previous research (e.g. Roelfs et al., 2012), we predicted that age and length of bereavement would be negatively and positively associated with self-reported physical health, respectively. Our prediction regarding age was supported while length of bereavement was not. One potential cause of this non-significant finding may be the method of measuring length of bereavement. Instead of measuring length of bereavement as a continuous variable, this study examined length of bereavement as a categorical variable. In addition, individuals who had experienced the death of loved one more than 2 years prior to the study were assigned to the same category. This conceptualization of length of bereavement may have masked the association between length of bereavement and self-reported physical health.

Another potential reason may be the fact that our prediction was based on research that emphasizes time since death. Other bereavement research has found that the amount of time that has passed since the death of a loved one may only impact a subset of bereaved individuals. Researches emphasizing psychological outcomes after the death of a loved one have investigated different trajectories of grief (e.g. Boerner et al., 2005; Bonanno, 2004; Newson et al., 2011). While the number of specific trajectories varies, the data suggest that half of bereaved individuals show no grief response or show a very small response before immediately returning to their baseline. Additionally, a subset of bereaved individuals (10%–20% depending on the study) may experience chronic or complicated grief, where the individuals show high levels of symptoms that

Table 5. Measurement and structural equation model for participants bereaved less than 2 years.

	R^2	*b*	β	*SE*	*CR*
Measurement model					
Negative social exchanges					
Informational		1.00	.50		
Instrumental		1.77	.77**	0.18	9.78
Emotional		2.11	.86**	0.20	10.20
Companionship		2.05	.84**	0.20	10.12
Self-reported physical health					
Physical functioning		1.00	.81		
Physical role functioning		1.43	.77**	0.10	14.35
Bodily pain		0.82	.71**	0.06	13.54
Structural equation model					
Negative social exchange	.119				
Agreeableness		0.04	.06	0.04	0.99
Openness to experience		0.08	.12*	0.04	1.86
Neuroticism		0.17	.28**	0.03	4.64
Extraversion		−0.01	−.02	0.04	−0.34
Conscientiousness		−0.06	−.09	0.04	−1.49
Age		0.00	.01	0.00	0.25
Gender		0.09	.11*	0.04	2.25
Self-reported physical health	.329				
Agreeableness		−4.05	−.13*	1.94	−2.08
Openness to experience		1.17	.03	1.99	0.59
Neuroticism		−5.11	−.18**	1.51	−3.38
Extraversion		1.46	.05	1.82	0.80
Conscientiousness		4.68	.15*	1.73	2.69
Age		−0.63	−.35**	0.08	−7.21
Gender		−1.83	−.04	1.83	−1.00
Negative social exchanges		−12.29	−.27**	2.75	−4.46

SE: standard error; *CR*: critical ratio.
Multi-group analysis for participants bereaved less than 2 years. Model fit: $\chi^2(123) = 256.95$, $p < .001$, CMIN = 2.08, CFI = .96, RMSEA = .03. Model comparison: $\chi^2(12) = 24.35$, $p < .05$. Gender: male = 0, female = 1.
*$p < .05$; **$p < .001$.

do not appear to change much over extended periods of time. These results suggest that the majority of bereaved individuals would not show differences or changes over time, which would limit the length of bereavement's predictive ability in a statistical analysis.

Negative social exchanges

Based on previous research (e.g. Bolger and Zuckerman, 1995; Iveniuk et al., 2014; Parker et al., 2012), it was hypothesized that neuroticism and extraversion would be positively associated with negative social exchanges, while conscientiousness and agreeableness would be negatively associated with negative social exchanges. Our findings regarding neuroticism and conscientiousness supported those predictions while our findings regarding extraversion and agreeableness did not. It is possible that our bereaved individuals who were higher in extraversion endorsed the trait of friendly greater than the other traits that constitute extraversion. Furthermore, it is possible that our bereaved individuals who were higher in agreeableness were more likely to engage in social network members' requests.

While we did not make an a priori prediction regarding the association between openness to experience and negative social exchanges, we found a small but significant positive association. It is possible that our bereaved individuals who were higher in openness to experience were more willing to engage in activities which may bring judgment or criticism from their social network in order to cope with the death of their loved ones.

Based on prior research (Beals and Rook, 2006; Carstensen, 1992), it was predicted that women and younger participants would report experiencing more negative social exchanges. Our prediction regarding women was supported; however, our prediction regarding age was not. The non-significance of the association between age and negative social exchanges was particularly surprising given that our prediction was based on socioemotional selectivity theory (Carstensen, 1992), a very heavily researched and well-supported theory. Perhaps there is

Table 6. Measurement and structural equation model for participants bereaved more than 2 years.

	R^2	*b*	β	*SE*	*CR*
Measurement model					
Negative social exchanges					
Informational		1.00	.53		
Instrumental		1.77	.79**	0.17	10.26
Emotional		1.94	.83**	0.18	10.48
Companionship		1.87	.81**	0.18	10.37
Self-reported physical health					
Physical functioning		1.00	.75		
Physical role functioning		1.75	.82**	0.12	13.79
Bodily pain		0.88	.75**	0.06	13.37
Structural equation model					
Negative social exchange	.217				
Agreeableness		−0.05	−.07	0.04	−1.17
Openness to experience		0.04	.05	0.04	0.85
Neuroticism		0.19	.30**	0.03	4.92
Extraversion		0.00	−.01	0.04	−0.17
Conscientiousness		−0.12	−.16*	0.04	−2.89
Age		0.00	−.14*	0.00	−2.89
Gender		0.17	.19**	0.04	3.66
Self-reported physical health	.145				
Agreeableness		−5.39	−.19*	1.85	−2.90
Openness to experience		3.17	.10	1.91	1.66
Neuroticism		−2.52	−.10	1.47	−1.71
Extraversion		0.70	.02	1.87	0.37
Conscientiousness		1.46	−.16	0.04	−2.89
Age		−0.31	−.22*	0.07	−4.19
Gender		−3.06	−.08	1.88	−1.62
Negative social exchanges		−6.76	−.18*	2.50	−2.69

SE: standard error; *CR*: critical ratio.
Multi-group analysis for participants bereaved more than 2 years. Model fit: $\chi^2(123) = 256.95$, $p < .001$, CMIN = 2.08, CFI = .96, RMSEA = .03. Model comparison: $\chi^2(12) = 24.35$, $p < .05$. Gender: male = 0, female = 1.
*$p < .05$; **$p < .001$.

something unique about being bereaved or the experiences that come with bereavement (e.g. attending social gatherings to mourn or celebrate the life of the deceased) that change the nature or frequency of social exchanges.

Negative social exchanges and self-reported physical health

With regard to negative social exchanges and self-reported physical health, we hypothesized that negative social exchanges would be negatively associated with self-reported physical health, which has been supported in previous research (e.g. Hill et al., 2014; Newsom et al., 2008). Our results supported this hypothesis. In fact, the inclusion of negative social exchanges in the structural equation model accounted for an additional 7.2 percent of the variance in self-reported physical health. This finding lends further support to the idea that the type and quality of interaction with one's social network is particularly important when trying to understand how individuals cope with life stressors. Future bereavement research should consider attempting to separate the impacts of different types of negative social exchanges, such as well-meaning negative social exchanges (e.g. offering inappropriate or unwanted advice), accidental negative social exchanges (e.g. failing to spend time together), and purposeful negative social exchanges (e.g. being critical about personal concerns), as outcomes may differ in kind or severity based on the type of negative social exchange.

Limitations

Results should be interpreted in the context of the following limitations. Due to the unique characteristics of the sample (e.g. Amazon Mechanical Turk sample, mostly highly-educated Caucasian individuals, and very diverse relationships with the deceased), results may not be generalizable to other populations experiencing bereavement. Furthermore, previous research indicates that individuals who have obtained higher levels of education or income

experience fewer negative social exchanges (Newsom et al., 2008). As such, this sample may have been less likely to experience negative social exchanges. It is possible that negative social exchanges would have a stronger association among personality and self-reported physical health in other samples. Future research should examine these associations in a more generalizable sample.

When examining personality, this study only examined the influence of each personality trait separately. It is possible that certain associations were not found among personality, negative social exchanges, and self-reported physical health as a result of not taking into consideration personality profiles or interactions among personality traits. Kinnunen et al. (2012) examined personality profiles and self-rated health in middle-aged adults, with results indicating that the over-controlled personality profile (i.e. higher in neuroticism and lower in extraversion) reported the worst self-rated health compared to the other personality profiles. Future research should examine the role of personality profiles or interactions among negative social exchanges.

There are some methodological concerns with the SF-12 and negative social exchanges scale. Specifically, physical health was assessed through self-report via the SF-12. Thus, the association between personality and self-reported physical health may be biased because individuals who are higher in neuroticism are more likely to report physical health symptoms (Friedman and Kern, 2014). Future research assessing physical health should examine objective measures of health to offset this reporting bias. In addition, the negative social exchanges scale asked participants to rate how frequently they have experienced negative social exchanges within the past year. As such, it is possible that participants were not reporting the amount of negative social exchanges they have received during their length of their bereavement, especially the individuals who experienced bereavement less than a year.

Finally, this study was a cross-sectional study. As such, only associations can be inferred from the results. Future research should take a longitudinal approach to personality, negative social exchanges, and physical health. Through this approach, researchers can control for previous negative social exchanges and physical health and examine whether changes in negative social exchanges influence physical health.

Implications

Despite the limitations, there are many important implications from our findings. First, our data suggest that personality retains the association with physical health even in the context of experiencing stressful life events with known impacts on physical health. Second, researchers in the bereavement field could target individuals who are more likely to experience greater declines in physical health based on their individual and social characteristics. These individuals could be assessed with a questionnaire, which would be resource inexpensive and efficient in time. Finally, our results suggest that negative social exchanges are an important area of study for future bereavement research. While much research has focused on the role of social support in assisting bereaved individuals, our data imply that the type and quality of interactions with members of the social network are important to examine. If the members of the bereaved individual's social network are not supportive, even if well-intentioned, they may cause or exacerbate difficulties for the bereaved adult.

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