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Bereavement hallucinations after the loss of a spouse: associations with psychopathological measures, personality and coping style

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Abstract: Bereavement hallucinations (BHs) were assessed in 175 conjugally bereaved participants four years post loss, to explore whether BHs were: a) associated with psychological distress and b) predicted by sociodemographic variables, personality and/or coping style. Participants with BHs scored significantly higher than those without BHs on prolonged grief, post-traumatic stress, depression symptoms, and emotional loneliness. Hierarchical logistic regression analysis showed avoidant coping, openness to experience, and length of marriage to significantly predict BHs, while detached coping was negatively associated with BHs. This study suggests that BHs may be an indicator of psychological distress in bereavement.
Introduction

Losing a significant other is something many people will experience in their life and, for most people, adapting to the loss is a painful but natural process (M; Stroebe, Schut, & Van den Bout, 2013). Previously, this process was considered to consist of different and progressive stages of grief, however, more recent theories and research support the dual-process theory, in which bereaved people tend to oscillate between being loss- and restoration-orientated in their reactions to the loss. Loss-orientation entails the emotional response to the loss, remembrance and grief intrusion, whereas restoration-orientation enables continuation of life by doing new things, attending to life challenges and distracting oneself from the grief (M; Stroebe & Schut, 2010). Persistent longing and yearning for the deceased 6 months after the loss characterize prolonged grief (Maciejewski, Maercker, Boelen, & Prigerson, 2016). Research on grief is expanding (M; Stroebe et al., 2013), but limited attention has so far been given to the common experiences of seeing, hearing, feeling, tasting, smelling and sensing the presence of the deceased (Castelnovo, Cavallotti, Gambini, & D'Agostino, 2015).

Central to this line of research are two intertwined issues, namely: 1) how best to conceptualize these experiences in general, and 2) whether they are best considered as a normal part of bereavement or a sign of pathology (Steffen & Coyle, 2012). BHs are reported by 40-70% of conjugally bereaved persons (Byrne & Raphael, 1994; Carlsson & Nilsson, 2007; Datson & Marwit, 1997; Grimby, 1993; Olson, Suddeth, Peterson, & Egelhoff, 1985; Rees, 1971; Schuchter & Zisook, 1993). While a classic term for these experiences is ‘hallucination’ (Castelnovo et al., 2015; Grimby, 1993; Olson et al., 1985; Rees, 1971), recent research often uses less pathologically-connoted terms like ‘sense of presence’ (Steffen & Coyle, 2010) and ‘experiences of continued presence’” (Hayes & Leudar, 2016). The association of hallucinations with mental pathology has a long history, but the link is challenged by studies showing that hallucinations are common in non-clinical populations (Daalman et al., 2011; Larøi, DeFruyt, van Os, Aleman, & Van der Linden, 2005), resulting in a debate of whether hallucinations are pathological per se. We have chosen to use the term bereavement hallucinations (BHs) without assuming any inherent pathology. In the present paper, BHs include experiences of seeing, hearing or sensing the presence of the deceased.

The ontology of BHs is yet to be fully understood. A central perspective in this effort is the ‘continuing bonds’ (CB) theory which argues that having a continued, but changed, attachment relationship to the deceased is a natural, though not necessarily adaptive, part of coming to terms with a loss (Silverman & Klass, 1996). According to attachment theory, the loss of a loved one will
activate searching behavior developed to ensure physical proximity; a goal of the attachment system (Bowlby, 1979). However, continued searching behavior is considered detrimental to the grief process as the bereaved person must recognize and accept the permanence of the loss if mourning is to be adaptive (Bowlby, 1979, 1997). BHs have been suggested to reflect such searching efforts (Field, 2006). Additionally, on the basis of significantly positive associations between BHs and grief severity, BHs have been suggested to signify unresolved loss, and to be an intrusive form of continuing bonds with similarities to symptoms of post-traumatic stress disorder (PTSD; Field & Filanosky, 2010). Furthermore, BHs are considered to be an associated feature of Persistent Complex Bereavement Disorder (PCBD), a diagnosis listed under ‘conditions for further study’ in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 2013). This association between BHs and prolonged grief is supported by several studies (Boelen & Hoijtink, 2009; Lee, 2015; Simon et al., 2011). Additionally, BHs have been associated with two other measures of psychological distress, namely severe loneliness (Carlsson & Nilsson, 2007; Grimby, 1993) and anxiety (Simon-Buller, Christopherson, & Jones, 1989).

However, despite the evidence that BHs might be an indicator of prolonged grief, as well as other forms of bereavement related psychological distress, a vast majority of people regard their BHs in a positive manner, describing their BHs as comforting or supportive (Datson & Marwit, 1997; Steffen & Coyle, 2012). Furthermore, the association between BHs and both grief severity or psychological distress has not been consistently demonstrated (Field, Nichols, Holen, & Horowitz, 1999). Such findings have prompted a more complicated interpretation; that BHs may not be uniquely associated with either normal or pathological grief. Such an alternative is supported, for example, by a semi-structured interview study of 39 widows, which found that the type of adjustment (positive vs. negative) may depend on an individual’s emotional interpretation of the BHs (Lindström, 1995). The 11 participants reporting either positive or negative BHs (defined as a sense of presence) had worse outcome on measures of anxiety, general psychological health and well-being, compared to those who responded to their BHs in a more neutral way (and widows without BHs). The last two categories did not differ on measures of psychological distress. Additionally, people rating their experiences as extremely positive reported difficulty coping with loneliness, and people with negative experiences tended to display avoidance (Lindström, 1995) Conversely, people reporting neutral experiences appeared to be coping better, reported using their BHs in decision-making and to help with loneliness. This demonstrates that BHs may not be inherently pathological, but may instead depend on the individual’s response to their BHs, possibly associated with coping style.
Pre-dispositioning factors of BHs are another key aspect of BHs that has received only scant attention. However, BHs has been associated with a ‘hysterical’ personality style in a semi-structured interview study of 293 conjugally bereaved participants (Rees, 1971) and with neuroticism and extraversion in a questionnaire study of 87 conjugally bereaved participants (Datson & Marwit, 1997). Likewise, a more recent study of 150 older persons (not all bereaved) found the personality trait of openness to experience to be associated with proneness to hallucinatory experiences (Larøi et al., 2005). Research exploring the association between sociodemographic variables and BHs is limited, but females may be more predisposed (Grimby, 1993), as well as older (Olson et al., 1985; Rees, 1971) and younger bereaved people (Olson et al., 1985).

In the present prospective survey study, the primary aim is to explore associations between BHs and psychological distress and the secondary aim is to explore possible pre-dispositioning factors of BHs. Based on previous research we pose the following research questions:

1. Do bereaved people with BHs report higher levels of psychological distress (i.e. grief severity, PTSD, depression, loneliness) compared to bereaved people who do not experience BHs?
2. Are sociodemographic characteristics (i.e. age, gender, length of marriage), personality (i.e. extraversion, neuroticism and openness), or coping style (i.e. rational, emotional, avoidant and detached) associated with experiencing BHs?

Method

Study procedure

The present study is part of a larger prospective survey on elderly bereaved persons (M. O'Connor, 2010), which was extended with a four year follow-up (M. O'Connor, Nickerson, Aderka, & Bryant, 2015). In the original study, all persons who lost their spouse during 2006, living in the municipal of Aarhus, Denmark and aged between 65 and 80 years (n=839), were contacted through the Danish Central Person Register (CPR) approximately 2 months post loss. The study had a longitudinal design with data collection points at 2, 6, 14 and 18 months post loss (M. O'Connor, 2010). Participants responding to the 6 months questionnaire package point (N=237) were contacted four years post loss for the final survey (M. O'Connor et al., 2015), which included the assessment of BHs reported on here. All of the data used in the present study were collected using self-report questionnaires by the second author of this paper.
Population

The present sample is made up of 175 elderly bereaved participants who responded to the questions regarding BHs in the four-year follow-up (74% response rate). At study entry the participants’ age ranged from 65 to 81 years (M= 71.8, SD= 4.1), and they had on average been married for 44.3 years (SD= 10.9, range = 3-60 years). Sixty-one percent (n=107) where female. A detailed description of the total sample is available elsewhere (M. O'Connor, 2010).

Measures

In the present study, we selected measures from the original study’s baseline (2 months post loss) and four-year follow-up based on the current research questions. An overview of the measures included in the main study is available in (M. O'Connor, 2010). From the baseline assessment, we included the participant’s age, gender and length of marriage along with the measures of coping and personality. From the four-year follow-up we included measures of grief severity, PTSD, depression, and two single items addressing loneliness on a seven-point Likert-scale ranging from ‘disagree’ (1) to ‘agree’ (7) (i.e. emotional loneliness; ‘I feel lonely even when I am with other people’ and social loneliness ‘I have no really close friends’) (W. Stroebe, Stroebe, Abakoumkin, & Schut, 1996), as well as a questionnaire on BHs.

*The Coping Style Questionnaire (CSQ)* consists of 37 items scored on a four-point Likert scale ranging from ‘never’ (1) to ‘always (4) (Elklit, 1996; Roger, Jarvis, & Najarian, 1993). The scale measures four coping styles: Rational coping, which is a problem-focused approach (range = 11-44), Detached coping, describing as a sense of being detached, but not avoidant of events (range = 6-24), Emotional coping, where attention is given to feelings (range = 10-40), and Avoidant coping, where one attempts to avoid problems and emotions (range = 10-40). Higher scores on a subscale indicate greater use of a specific coping strategy. In the present study, the internal consistency of the subscales were acceptable to good: α = .62-.78, mean-inter-item-correlation (MIIC) = .14-.27.

*The NEO personality inventory revised (NEO PI-R) short version* consist of 60 items rated on a five-point Likert scale ranging from ‘strongly disagree’ (0) to ‘strongly agree’ (4) (Costa & McCrea, 2004). The three included personality domains are Openness, Neuroticism and Extraversion, which all range from 0-48 and had satisfactory internal consistency in the present study: α = .70-.80, MIIC = .16-.25.

*The Inventory of Complicated Grief-R (ICG-R)* was used to measure prolonged grief symptoms.
The scale is a short version of the Inventory of Complicated Grief (ICG) and contains 15 items scored on a five-point Likert scale ranging from ‘never’ (1) to ‘always’ (5) (Jacobs, Mazure, & Prigerson, 2000; Prigerson et al., 1995). The ICG-R focuses on separation distress (like yearning, longing and searching) and traumatic distress, which are bereavement-specific manifestations of being traumatized by the death of a spouse (such as ‘disbelief’, ‘numbness’ and a ‘shattered’ worldview). The total score ranges from 15 to 75. The internal consistency was good in the present study: $\alpha = .93$, MIIC = .46.

The Harvard Trauma Questionnaire – Part IV (HTQ) consists of 31 items, rated on a four-point Likert scale ranging from ‘not at all’ (1) to ‘very often’ (4) (Mollica, 1992). The total score measure used in the present study was based on the first 16 items resembling the three core clusters of post-traumatic stress disorder (PTSD) described in DSM-IV: intrusion, avoidance and arousal (American Psychiatric Association, 1994). The total score ranges from 16 to 64. The internal consistency was good in the present study: $\alpha = .84$, MIIC = .25.

The Beck Depression Inventory-II (BDI-II) is a revised version of the 21-items Beck Depression Inventory (BDI; Smarr & Keefer, 2011). The scale consists of 21-items rated on a 4-point Likert scale ranging from ‘not at all’ (0) to ‘extreme forms of symptoms’ (3), and has a score range of 0 to 63. It corresponds with DSM-IV criteria for identifying the risk for major depression and consists of items measuring cognitive, affective and somatic symptoms of depression. In the present study, the internal consistency was good: $\alpha = .88$, MIIC = .32.

A 10 item questionnaire on BHs was translated and the original questionnaire was modified with permission from the author (Grimby, 1993). This resulted in a six item questionnaire relevant to the aims of the present paper: Using a ‘yes/no’ response format the first four questions address whether the participant had 1) experiences or sensed the deceased’s presence in any way, 2) seen the deceased, 3) talked to/with the deceased, and 4) heard sounds the deceased used to make (humming, voice, creaking chair etc.). Participants were asked to rate the valence of their experience on a three point ordinal scale of ‘positive’, ‘neutral’ and ‘negative’. Lastly, participants were asked about the frequency of any continued experiences four years post loss on a five point ordinal scale: daily, weekly, monthly, yearly, and once this year. There was some discrepancies in the question about continued monthly experiences, and therefore it was decided to pool the participants into two groups illustrating continued frequent experiences (daily or weekly) and infrequent experiences (yearly or once a year).
Statistical analyses

Missing data were excluded pair-wise in all of the analyses. Participants confirming having experiences or sensed the presence of the deceased in any way was categorized as having had BHs. Scale reliability was assessed by internal consistency.

Differences between participants with and without BHs on measures of psychological distress (i.e. symptoms of prolonged grief, PTSD, depression and loneliness) four years post loss was explored using independent t-tests. Based on the results two post-hoc analyses were conducted: 1) Differences in psychological distress between participants rating their experience as positive, neutral or negative was explored using a Kruskal-Wallis test. 2) Differences in psychological distress between people with frequent BHs (daily or weekly) and infrequent BHs (yearly or once a year) were explored using a Mann-Whitney test.

Pre-dispositioning variables of having BHs was explored using a hierarchical logistic regression analysis with forced entry in three blocks containing 10 variables in total: 1. block) age, gender and length of marriage (demographic variables), 2. block) openness, neuroticism and extraversion (personality traits) 3. block) avoidant, emotional, rational and detached coping (coping styles). The variables in each block were chosen based on previous research. Assumptions regarding linearity of the logit and multicollinearity were carried out showing data to be eligible for this type of analysis. A correlation matrix of the 11 variables included in the logistic regression was conducted post-hoc.

All analyses were performed using SPSS 24.

Results

More than half (53%, n=92) of the participants reported having some kind of BHs. More specifically, 52% (n=48) of these had seen the deceased spouse, 45% (n=41) had heard their deceased and 32% (n=29) had talked to/with their spouse. A majority of participants reported more than one kind of BHs, but 20% (n=18) did not specify the nature of their experience.

Psychological distress

Analyses showed that the participants experiencing BHs had significantly higher levels of prolonged grief symptoms, PTSD symptoms and higher levels of both depression and emotional loneliness than participants without these experiences. The same pattern was found for levels of social loneliness, but this difference was not significant (See Table 1).
A majority (61%, n=54) of the participants with BHs rated their experiences as positive, 31% (n=27) rated them as neutral and only 7% (n=8) as negative, but there were no significant difference in psychological distress between these three groups on any of the measures. However, a marginal significant association on PTSD score was found $\chi^2(2, n = 82) = 5.10, p = .078$, suggesting that participants rating their experiences as neutral ($Md = 32, n = 25$) reported higher PTSD scores compared to people rating their experiences as positive ($Md = 27.5, n = 50$). Interestingly, the PTSD scores of those rating the experience as negative had a lower median ($Md = 25, n = 7$) than those in the other groups, but not significantly so. As such, no interpretation can be offered of this group.

In addition, the post-hoc Mann-Whitney test showed no significant difference between the small subgroup (7%, n=12) with daily or weekly BHs and the 55 (48%) participants with yearly BHs four years after the loss on psychological distress measures. However, a marginal significant association on both prolonged grief symptoms ($U = 213, z = -1.706, p = .088, r = .21$) and depression symptoms ($U = 179.5, z = -1.723, p = .085, r = .23$) was found. The results point to higher scores on prolonged grief ($Md = 29.5, n = 12$) and depression ($Md = 14, n = 11$) for people continuing having frequent BH compared to people having infrequent BH (grief: $Md = 23.5, n = 52$; depression: $Md = 6, n = 49$) four years post loss.

**Personality, coping and demographic variables**

The logistic regression model of pre-dispositioning variables of BHs correctly classified 69.3% of the 127 included participants as experiencing or not experiencing BHs ($\chi^2(10)= 31.6, p<.001$) thereby indicating the models ability to distinguish between bereaved with and without BHs. The model as a whole explained between 22% (Cox and Snell R square) and 29.5% (Nagelkerke R square) of the variance in having BHs (see Table 2).

None of the variables contributed significantly when entered in the first block, but length of marriage became a significant contributor in the second block. As can be seen in the Pearson correlation matrix (Table 3), there was a significantly positive association between longer marriage and having BHs ($r=.23, p<.001$), as well as a significant association to the personality trait of openness ($r=-.22, p<.01$). None of the personality variables contributed significantly in the second
block, but the personality trait of openness became significant in the third block, when coping style entered the model. While the personality trait of openness was not significantly associated with BHs per se (\(r=.10, p=.20\)), there was a significantly negative correlation between openness and avoidant coping style (\(r=-.21, p<.01\)). In the final logistic model, high scores on avoidant coping were the strongest predictor of experiencing BHs; participants with high scores being 1.22 times more likely to experience BHs than participants with low scores on avoidant coping. The strongest predictor of not experiencing BHs was high scores on detached coping, where participant with high scores were 0.81 less likely to experience BHs than participant with low scores on detached coping. Participant with longer marriages were 1.05 more likely to experience BHs than participants who had been married for shorter time. Lastly, participants with high scores on openness to experience were 1.08 times more likely to have BHs than participants with low scores (See Table 2).

*Insert table 3 here*

**Discussion**

Consistent with previous research (Castelnovo et al., 2015), a little more than half of the sample in this study reported having experienced BHs after the death of their spouse. This finding underlines that BHs are common following conjugal loss.

**Psychological distress**

In the present study, the participants with BHs scored significantly higher on emotional loneliness and symptoms of prolonged grief, PTSD and depression four years post loss compared to participants without BHs. These results support the position that having BHs is associated with higher levels of bereavement related psychological distress.

The strong relationship between BHs and higher levels of prolonged grief symptoms renders support for BHs as a feature supporting the diagnosis of PCBD (APA, 2013), a diagnosis with substantial psychometric overlap with Prolonged Grief Disorder (Maciejewski et al., 2016). In particular, the association between BHs and higher levels of prolonged grief symptoms could be interpreted as BHs keeping the bereaved person in a loss-oriented position by being a continuous reminder of the loss. At the same time, a majority of the participants with BHs rated their experiences positively, suggesting that a positive evaluation of the experience is not, by definition, related to better clinical outcome (Steffen & Coyle, 2012). This apparent discrepancy could be explained by neurobiological accounts of prolonged grief disorder. A study of 23 bereaved women,
which showed that while pain-related neutral activation (related to the social pain of loss) happens to both people with uncomplicated and prolonged grief, only participants with prolonged grief symptoms showed neural activity in pathways typically mediating reward related to attachment behavior (M.-F. O'Connor et al., 2008). Hence, BHs could act similarly on the reward network as the pictures of the deceased and grief-related words used in the grief-eliciting task, and as such be activating neural rewards related to attachment behavior. Additionally, the neural reward system has an addictive aspect, possibly explaining the attraction of continuing reveries of the deceased in prolonged grief, despite its suggested interference with adjustment (M.-F. O'Connor et al., 2008). BHs could be part of a craving response of the deceased making adaption to the loss more difficult. This account is comparable to the CB explanation of BHs as a part of activated searching behavior after a loss (Field, 2006). However, BHs could also be intensifying the grief by reminding the bereaved person of the reality of the loss. Increased feelings of loneliness and grief after realizing that the deceased would never return was reported by participants in a previous study of BHs (Carlsson & Nilsson, 2007). Understanding BHs as a mental intrusion of the loss is in line with previous suggestion that BHs are externalized continuing bonds similar to intrusion in PTSD, or put another way, an attachment representation of the deceased manifested in outer reality (Field & Filanosky, 2010). This will be discussed further in relation to avoidance below.

The association between BHs and higher levels of grief symptoms is in line with previous research (Boelen & Hoijtink, 2009; Field & Filanosky, 2010; Lee, 2015; Simon et al., 2011). However, as most of the research on BHs relation to grief severity (this study included) has a cross-sectional design, we should be cautious in term of causal inferences. Rather than intensifying grief as suggested above, BHs could be a help to people dealing with high levels of grief severity. Furthermore, as hallucinatory experiences co-occur with both depression and PTSD (Baethge et al., 2005; Jessop, Scott, & Nurcombe, 2008), it is questionable whether BHs primarily are connected to one of these pathological distress measures rather than prolonged grief symptoms per se. However, to our knowledge, symptoms of PTSD have not previously been explored in relation to BHs and the present study was not designed to answer which pathology BHs is primarily connected to.

In accordance with previous research (Grimby, 1993), BHs is associated with higher levels of loneliness. However, it was only emotional loneliness (i.e. feeling alone while together with other people) which was associated with having BHs, suggesting that BHs may be more related to a subjective feeling of being isolated rather than to a lack of social companionship. Just as BHs may be a mental response to the loss and the related loneliness, then BHs could in turn cause loneliness
because people tend not to disclose having BHs as they feel such experiences are stigmatized (Rees, 1971). This stigma could result in a mental distancing to other, which makes the bereaved feel isolated and alone with their experiences.

In contrast to the study by Lindström (1995), participants in this study who rated their experiences positively, neutrally or negatively did not differ significantly on any measure of psychological distress. Furthermore, the present result showed a trend toward higher scores on PTSD for participants with neutral experiences compared to positive experiences. However, the present study was underpowered to examine this question in full detail and further research is still needed.

Finally, having more than weekly BHs four years post loss was not significantly associated with more psychological distress than having infrequent BHs-experiences. This result suggests that in term of adjustment to the loss, the frequency of BHs is not a determining factor. However, the study was also underpowered on this question, and the results indicated a small trend towards more psychological distress in participants with frequent BHs. This is in some accordance with a previous study finding an association between ongoing BHs and higher levels of grief severity five years post loss (Field, Gal-Oz, & Bonanno, 2003); even though they did not differentiate between the frequency of the experiences in that study, their findings indicates that continued BHs do not appear to be adaptive.

**Personality, coping and demographic variables**

In this study, four variables predicted whether participants had BHs. Higher levels of avoidant coping was the strongest predictor of having BHs. This coping style is considered maladaptive, as it involves denial and avoidance of reality (Roger et al., 1993). People with prolonged grief may have intrusive longing for the deceased, which they attempt to manage by engaging in avoidance behavior (Arizmendi, Kaszniak, & O'Connor, 2016). As such, people with BHs could be avoiding the reality of the loss due to the increased longing for the deceased, and BHs could be experienced as an intrusion of the loss similarly to intrusive PTSD symptoms. This is consistent with findings showing that avoidant coping is related to higher PTSD severity after the loss of an infant (Christiansen, Elklit, & Olff, 2013). However, BHs could also be considered a part of avoiding the reality of the loss, as the deceased often is considered present during a BH. In this sense, BHs may be perceived as positive during the experience, even if they subsequently intensify the pain of the loss and possibly contribute to more psychological distress.

In contrast, higher scores on detached coping was the only predictor of not experiencing BHs in this
study. Detached coping is considered adaptive because it includes neither denial nor avoidance, but is the result of being able to accept the reality of the stressor and being emotionally detached, making it possible to better handle stressful situations (Roger et al., 1993). A possible explanation of the association between detached coping and not having BHs could be that a detached strategy helps the bereaved person to accept the loss, thereby avoiding becoming overwhelmed and engaging in continual searching behaviors or experiencing BHs as a mental intrusion.

Longer marriages predicted having BHs in the final model, which is in accordance with previous findings (Rees, 1971). This result is supported by the significantly positive correlation between the two. Length of marriage is very likely associated with the amount of interaction between the couple, both verbal and non-verbal, resulting in well-established communication and behavioral patterns. This could be the basis for the mind’s manifestations of BHs; however, length of marriage could also be associated with the strength of the attachment bond (though there to our knowledge is no research so far supporting this suggestion), thereby possibly relating BHs further to attachment (Bowlby, 1977).

The personality domain of openness to experience was also a significant predictor of having BHs in the final model. This association should be seen in light of the scale authors suggestion that openness to experience is characterized by openness to unusual cognitive and perceptual experiences, which in turn is supported by its association with proneness to hallucinatory experiences in elderly (Larøi et al., 2005) and to the presence of positive schizotypy symptoms in a non-clinical sample (Ross, Lutz, & Bailley, 2002). Hence, openness to experience could be a pre-dispositioning variable for experiencing BHs. Of note, neither extraversion nor neuroticism was predictive of having BHs, in contrast to the Datson and Marwits (1997) study. However, it is in accordance with Larøi and colleagues’ (2005) finding that neuroticism did not correlate with proneness to hallucinations in their elderly sample.

It should be noted that both length of marriage and the personality trait of openness only contributed significantly to the model in interaction with other variables. Whereas longer marriage was significantly associated with having BHs, the personality trait of openness was not, and neither was the coping style of avoidance; however, these two latter variables were significantly negatively correlated with each other. This could mean that one of these variables may not be a predictor, but rather a suppressor facilitating the other variable. Thus, the complexity of BHs is greater than anticipated, and our understanding of the relationship between BHs and the predictors revealed in the present study is still limited.
The findings of this study adds to a neglected field within bereavement research, but should be considered with the following limitations in mind. First, the present study was a post-hoc addition to an existing study, which was not originally designed to evaluate the present research questions. In consequence, causality inferences are only tentative and the power of the post-hoc tests was limited. The present data were chosen from a large pool of available data; and though the measures were not included in the original study based on the aims of this study, the extracted measures were chosen based on previous research. Secondly, the present sample consisted of elderly people bereaved within a one year time span in a defined geographical area. This may limit the generalizability of the finding to other populations. Thirdly, the validity of the BHs-assessment could be questioned. The presence of the deceased can be experienced in many ways, including vivid dreams and receiving symbols or messages from the deceased; therefore, the broad framing of the initial BH question (“experiences in any way”) might have tapped into a broader phenomenon than hallucinatory experiences. However, the scores of the 18 (20%) participants reporting only sense of presence experiences did not differ significantly from the participants reporting either visual or auditory experiences on any of the included measures. Therefore, a small subgroup only experiencing dreams or symbols did not influence the overall results of the present study. Fourth, is the possible connection between hallucinatory experiences and both sensory loss and cognitive deficient in the elderly (Badcock, Dehon, & Laroi, 2017), which was not addressed in the present study. This is an issue which needs to be address in future research if BHs are to be understood.

Conclusions and future directions

The current study results indicate a significant relationship between experiencing BHs and higher levels of bereavement related psychological distress. However, it is still equivocal whether some characteristics of BHs mediates the relationships to bereavement adjustment as well as the nature of the causal relationship between BHs and adjustment. Additionally, based on the present study it is not clear whether BHs is primarily associated with prolonged grief, or perhaps depression or PTSD, both of which are known to cause hallucinatory experiences. Further research is needed, and could profitably explore some of these issues, as well as associations to attachment.

Furthermore, the results indicate a significant relationship between BHs and both avoidant and detached coping style, as well as openness to new experiences and length of marriage; however, given the variables interaction it seems clear that the question of pre-dispositioning variables is multifaceted. Further research is needed, and should consider the variables possible interaction in the study design.
References


Smarr, K. L., & Keefer, A. L. (2011). Measures of depression and depressive symptoms: Beck Depression Inventory - II (BDI - II), Center for Epidemiologic Studies Depression Scale (CES - D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire - 9 (PHQ - 9). *Arthritis Care & Research, 63*(S11), S454-S466. doi:10.1002/acr.20556


Table 1: Results of independent t-test comparing participants with and without BHs on measures of psychological distress

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<th>Without BH</th>
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<th>Upper CI</th>
<th>r</th>
<th>p</th>
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<td>N</td>
<td>M (SD)</td>
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<td>PG^a</td>
<td>72 20.82 (5.33)</td>
<td>82 28.60 (10.83)</td>
<td>-5.76</td>
<td>121.27</td>
<td>-10.45</td>
<td>-5.10</td>
<td>.46</td>
<td>&lt;.001</td>
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<tr>
<td>PTSD^b</td>
<td>75 23.29 (4.10)</td>
<td>87 28.83 (7.29)</td>
<td>-5.70</td>
<td>152.53</td>
<td>-7.45</td>
<td>-3.62</td>
<td>.42</td>
<td>&lt;.001</td>
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<tr>
<td>Depression^c</td>
<td>71 3.41 (4.10)</td>
<td>84 9.10 (7.23)</td>
<td>-6.14</td>
<td>135.00</td>
<td>-7.52</td>
<td>-3.85</td>
<td>.47</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Emotional loneliness</td>
<td>78 1.90 (1.25)</td>
<td>91 2.80 (1.95)</td>
<td>-3.50</td>
<td>155.52</td>
<td>-1.36</td>
<td>-0.38</td>
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<tr>
<td>Social loneliness</td>
<td>78 2.60 (2.15)</td>
<td>91 3.19 (2.25)</td>
<td>-1.72</td>
<td>167.00</td>
<td>-1.25</td>
<td>-0.09</td>
<td>NA</td>
<td>=.807</td>
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^a Prolonged grief symptoms ^b post-traumatic stress disorder symptoms ^c Symptoms of depression

Table 2: A hierarchical logistic regression model predicting variables of having BH after the loss of a spouse

<table>
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<tr>
<th>Predictor^a</th>
<th>B (SE)</th>
<th>df</th>
<th>Wald’s $\chi^2$</th>
<th>Odds ratio [95% CL]</th>
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<td>Block 1</td>
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<tr>
<td>Gender</td>
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<td>1</td>
<td>3.71</td>
<td>0.47 [0.22-1.01]</td>
</tr>
<tr>
<td>Age</td>
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<td>1</td>
<td>1.27</td>
<td>1.06 [0.96-1.17]</td>
</tr>
<tr>
<td>LM^b</td>
<td>0.03   (0.02)</td>
<td>1</td>
<td>3.40</td>
<td>1.03 [1.00-1.07]</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.09  (3.49)</td>
<td>1</td>
<td>2.12</td>
<td>NA</td>
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<td>Block 2</td>
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<tr>
<td>Gender</td>
<td>-0.66  (0.41)</td>
<td>1</td>
<td>2.58</td>
<td>0.52 [0.23-1.16]</td>
</tr>
<tr>
<td>Age</td>
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<td>1</td>
<td>1.10</td>
<td>1.06 [0.95-1.17]</td>
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<tr>
<td>LM</td>
<td>0.42   (0.19)</td>
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<td>1.04 [1.00-1.08]</td>
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<tr>
<td>Openness</td>
<td>0.05   (0.03)</td>
<td>1</td>
<td>2.74</td>
<td>1.05 [0.99-1.12]</td>
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<tr>
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<td>0.02   (0.03)</td>
<td>1</td>
<td>0.46</td>
<td>1.02 [0.96-1.09]</td>
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<td>Extraversion</td>
<td>-0.01  (0.04)</td>
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<td>0.06</td>
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<tr>
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<td>Gender</td>
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<td>0.45 [0.19-1.08]</td>
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<tr>
<td>Age</td>
<td>0.07   (0.05)</td>
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<td>1.73</td>
<td>1.07 [0.97-1.19]</td>
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<tr>
<td>LM</td>
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<tr>
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<tr>
<td>Avoidant</td>
<td>1.20   (0.06)</td>
<td>1</td>
<td>9.37</td>
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<tr>
<td>Rational</td>
<td>0.01   (0.05)</td>
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$\chi^2$ df R^2

Overall model evaluation
Model 31.60*** 10 0.22-0.295

Goodness-of-fit test
Hosmer & Lemeshow 14.99 8

^a Forced entry was employed in each block. ^b Length of marriage
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* Length of marriage. ’<.1, * p<.05, ** p<.01, ***p<.001