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What a difference a year makes: Comparing relationships between stressful life events, mood and life satisfaction among older adults and their working-age counterparts.

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Disclosure of interest

The authors report no conflicts of interest.

What a difference a year makes: Comparing relationships between stressful life events, mood and life satisfaction among older adults and their working-age counterparts.

Aging and Mental Health

Objectives: Stressful life events (SLEs) have been linked to depression, anxiety and reduced life satisfaction. The inoculation hypothesis of aging suggests older adults may be less vulnerable to poor psychological outcomes following SLEs than working-age adults. The current study compared relationships between SLEs, mood and life satisfaction among older adults (65+) and adults aged 50-64, and investigated whether group identification and loneliness moderate these relationships.

Method: A community-based sample of 121 Scottish participants responded to measures of SLEs (modified Social Readjustment Rating Scale), symptoms of depression and anxiety (Hospital Anxiety and Depression Scale), life satisfaction (Life Satisfaction Index A), group identification (Group Identification Scale), and loneliness (UCLA Loneliness Scale).

Results: In the 50-64 age group, number of SLEs was significantly associated with greater symptoms of depression and anxiety, and reduced life satisfaction. Group identification and loneliness did not moderate these relationships. There were no significant relationships in the older adult group.

Conclusion: The finding of relationships in working-age, but not older adults, supports the inoculation hypothesis of aging. Further research to better understand changes across the lifespan, and inter-relationships with related variables, would be valuable from both theoretical and clinical perspectives.

Keywords: aging, life events, mental health, group identification, loneliness

Introduction

Background

Despite health and social challenges associated with aging, older adults typically report higher levels of wellbeing (Jones, Tabassum, Aresu & Abayaratne, 2011) and life satisfaction (Brown, 2014; Scottish Government, 2011) than working-age adults. To explain these findings, the inoculation hypothesis of aging posits that past stress increases resilience to future stressors and, since older adults have greater emotional regulation, maturity, and life experience than working-age adults, they are less vulnerable to poor psychological outcomes following stressors (Eysenck, 1983; Palgi, Shrira & Shmotkin, 2015; Shrira, Palgi, Hamama-Raz, Goodwin & Ben-Ezra, 2014).

In contrast, the vulnerability hypothesis posits that age-related factors, such as functional and physical decline, bereavements, and decreases in financial and social resources, place older adults at greater risk of poor psychological outcomes following stressors than working-age adults (Palgi et al., 2015; Solomon & Ginzberg, 1998; World Health Organization, 2001). This hypothesis is supported by findings of higher prevalence of poor mental health among older adults with long-term illnesses, and poorer mental wellbeing and lower life satisfaction with increasing age among older adults (Brown, 2014; Knott, 2013; NHS Health Scotland, 2012).

Relationships between stressful life events, mood and life satisfaction

A substantial body of research has found relationships between number of recent stressful life events (SLEs) experienced and onset of episodes of depression, among both community-based working-age adults and psychiatric patients (see reviews by Hammen, 2005; Kessler, 1997; Mazure, 1998; Tennant, 2002). For example, Mazure (1998) found patients with depression were 2.5 times more likely to have experienced recent stressors compared to

individuals who did not have depression. Evidence for older adult populations is smaller, but a modest significant positive relationship has been found between number of recent SLEs and symptoms of depression in both community-based and patient populations of older adults (Djernes, 2006; Fiske, Gatz & Pedersen, 2003; García-Peña et al., 2013; Kraaij, Arensman & Spinhoven, 2002; Lim et al., 2015; Phillips Carroll & Der, 2015; Zarit & Zarit, 2011). Musliner et al. (2015) found community-based adults aged 50-94 who had experienced at least one recent SLE were twice as likely to report four or more symptoms of depression than those who had not.

This relationship may be bi-directional, with longitudinal, community-based studies of both working-age and older adults finding recent SLEs were both predictive of, and predicted by, symptoms of depression (Fiske et al., 2002; Phillips et al., 2015). Several specific SLEs, such as experiencing severe illness, loss of social contacts or socio-economic problems, such as limited education and financial problems, appear to be most closely related to symptoms of depression in older adults (Djernes, 2006; Kraaij et al., 2002; Lieberman & Peskin, 2013).

In terms of SLEs experienced over the lifetime and symptoms of depression, evidence is limited and results conflicting. A study of older adults living in supported accommodation found number of SLEs in childhood did not relate to symptoms of depression (Kraaij, Kremers & Arensman, 1997). However, a longitudinal, community-based study by Assari and Lankarani (2016) found SLEs predicted subsequent risk of an episode of major depression 25 years later. Furthermore, greater cumulative lifetime adversity has been associated with more symptoms of depression, lower quality of life, and faster functional decline among older adults (Shrira, 2012; Shrira & Litwin, 2014). Thus, lifetime SLEs may continue to have a negative impact on mental health and wellbeing in later life.

Relationships between SLEs and anxiety are unclear. There is evidence for a relationships between SLEs and generalised anxiety disorder in working-age adults (Blazer, Hughes & George, 1987; Kendler, Hettema, Butera, Gardner & Prescott, 2003). However, Phillips et al. (2015) found SLEs did not predict symptoms of anxiety, but instead anxiety scores predicted subsequent SLEs within five years. The relationship between SLEs and symptoms of anxiety in older adults has not previously been explored.

A negative relationship has been found between recent SLEs and life satisfaction in older adults (Krause, 1994). Krause (2004) found exposure to trauma over the lifetime was associated with reduced life satisfaction among community-based older adults. These findings suggest SLEs are also associated with reduced wellbeing more generally.

Potential moderating factors – group identification and loneliness

Whilst the evidence is small, relationships between SLEs, depression and life satisfaction appear to be moderated by other variables, such as social support (Kraaij et al., 2002; Melchiorre et al., 2012), emotional support (Krause, 2004), resilience (Lim et al., 2015), self-esteem and education (Norris & Murrell, 1984). For instance, a meta-analysis by Kraaij et al. (2002) found social support played a buffering role, reducing the strength of relationships between SLEs and negative psychological outcomes.

For this study, group identification and loneliness were chosen for investigation as potential moderators. Two variables were chosen in order to keep the questionnaire concise. These variables both relate to interaction with others and could therefore, if found to be moderators, provide opportunity for clinical intervention to reduce likelihood of poor psychological outcomes following experience of SLEs. Whilst both variables relate to connection with others they are distinct constructs, with one concerning group belonging and

the other desired versus actual social interactions. It was therefore considered important to investigate both variables.

Group identification has been defined as subjective feelings of group belonging and commonality with other members of a social group (Wakefield et al., 2016). Compared to individuals with low group identification, adults (aged 18-97) who reported higher levels of group identification tended to have greater life satisfaction (Wakefield et al., 2016) and fewer symptoms of depression (Rosenthal, Somers, Fleming & Walsh, 2014; Sani, Madhok, Norbury, Dugard & Wakefield, 2015a). Age has been found to correlate positively with group identification (Wakefield et al., 2016). Thus, group identification may be protective, particularly for older adults, reducing likelihood of poor psychological outcomes following SLEs.

Loneliness is the subjective experience of discrepancy between desired and actual social interactions with others (Dykstra, 2009; Victor et al., 2000). Despite increased likelihood of being socially isolated, most older adults do not report being lonely (Dykstra, 2009; Victor et al., 2000). However, older adults who report high levels of loneliness have been found to be at increased risk of both physical and mental health problems (Davidson & Rossall, 2015; Ong, Uchino & Wethington, 2015; Victor et al., 2000). Additionally, SLEs are associated with increased loneliness among older adults (Victor et al., 2000; Wenger, Davies, Shahtahmasebi & Scott, 1996; World Health Organization, 2016), suggesting loneliness may affect relationships between SLEs, mood and life satisfaction.

Aims of the current study

This study aimed to investigate relationships between SLEs, mood and life satisfaction in older adults and adults aged 50-64, and compare these relationships between age groups. The study also sought to examine the roles of group identification and loneliness on these

relationships.

Research questions

1. Do relationships exist between SLEs, mood and life satisfaction in both age groups?
2. Are these relationships distinctive between age groups?
3. Are group identification and loneliness related to mood and life satisfaction?
4. Do group identification and loneliness moderate relationships between SLEs, mood and life satisfaction?

Hypotheses

1. In both age groups, positive relationships were predicted between number of SLEs and symptoms of depression and anxiety, while negative relationships were predicted between number of SLEs and life satisfaction scores.
2. In line with the inoculation hypothesis of aging, stronger relationships were predicted between SLEs, mood and life satisfaction in the 50-64 age group, compared to the older adult group.
3. Group identification was predicted to be negatively related to depression and anxiety, and positively related to life satisfaction. Loneliness was predicted to be positively related to depression and anxiety, and negatively to life satisfaction.
4. Both group identification and loneliness were predicted to moderate relationships between SLEs, mood and life satisfaction, such that high group identification and low loneliness would reduce the strength of these relationships.

Method

Participants

This was a community-based study of 121 participants aged 50 years or older (50-64 age group: $n = 71$; older adult group: $n = 50$). In line with current literature (Department of Health 2001; Mental Health Foundation, 2009; World Health Organization, 2015; Victor, Scambler, Bond & Bowling, 2000; Zarit & Zarit, 2011), 'older adults' were defined as adults aged 65 years or older. The comparison group of adults aged 50-64 was chosen to include individuals who were close in age to the older adult group and, subsequently, likely to have experienced a substantial number of SLEs over their lifetimes. Participants were recruited through researcher visits to community groups based in Scotland, and through advertising in community emails and newsletters.

Procedure

Participants were invited to complete a questionnaire consisting of several measures related to mental health and wellbeing, and completed either paper ($n = 26$) or online ($n = 95$) versions. All participants were provided with an information sheet before taking part and debrief sheet following completion. For the paper version, participants signed a consent form which was separated from the questionnaire to ensure anonymity. For the online version, participants were told consent would be assumed by participation and submission of the questionnaire. Participants were informed responses would be confidential and they were free to withdraw at any time. Participants were advised that if they experienced any stress or discomfort they should withdraw from the study immediately and could contact their GP, or the Samaritans or Silver Line helplines for further support. Ethical approval was granted by the University Research Ethics Committee of the University of Dundee.

Materials

Stressful life events (SLEs)

A modified version of the Social Readjustment Rating Scale (Holmes & Rahe, 1967) was used to measure SLEs. Participants identified, from a list of 39 items, SLEs which had happened to them in the past year and over their lifetime. To ensure the inventory was concise and relevant, five items were removed (*outstanding personal achievement, begin or end of school or college, change in school or college, vacation, Christmas*) and three items were added (*death of a child, injury/illness of spouse, divorce of a child*). Number of SLEs experienced was summed, with separate scores for past year SLEs and lifetime SLEs.

Symptoms of depression and anxiety

The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) was used to assess current symptoms of depression and anxiety. Participants rated, on a 4-point scale from 0-3 (with 3 indicating higher frequency of symptoms), 7 items related to symptoms of anxiety and 7 items related to symptoms of depression. Item scores were summed to give a score for each subscale (range = 0-21). HADS scores are categorised as normal (0-7), mild (8-10), moderate (11-14), and severe (15-21). The HADS has good internal consistency and test-retest reliability (Bjelland, Dahl, Haug & Neckelmann, 2002), and has been validated in both working-age and older adults (Fitzpatrick, Gibbons & Mackintosh, 2009; Flint & Rifat, 2002).

Life satisfaction

Life satisfaction was measured using the 20-item Life Satisfaction Index A (LSI-A) (Neugarten, Havighurst & Tobin, 1961). Participants responded 'agree', 'disagree' or 'undecided' with each item was scored either 0 or 1 (for 12 items, 'agree' = 1; for 8 items,

‘disagree’ = 1). Scores were summed, with higher scores indicating greater life satisfaction (range = 0-20). The LSI-A was developed, and validated, specifically for community-based adults aged 50-90 (Neugarten et al., 1961; Sperlinger, Clare, Bradbury & Culverwell, 2004). It has reasonable-strong test-retest reliability, validity, and internal consistency (Adams, 1969; BioPsychoSocial Assessment, n.d.; Neugarten et al., 1961).

Group identification

The Group Identification Scale (GIS) (Sani, Madhok, Norbury, Dugard & Wakefield, 2015b) was used to assess subjective feelings of in-group belonging and commonality with other in-group members. The GIS consists of four items; rated on a 7-point scale from 1 (‘I strongly disagree’) to 7 (‘I strongly agree’). In this study, the GIS was used to assess participants’ identification with three groups: their family, local community, and social group of their choice. Scores for each group (range 4-28) were dichotomised into a binary scale of either identification (score $\geq 20 = 1$ point) or lack of identification (score $< 20 = 0$ points).

Summing these points produced an overall GIS score of how many of the three groups the participants identified with (range 0-3). The GIS has shown good internal and test-retest reliability, and convergent and divergent validity, in community-based samples (Sani et al., 2015b).

Loneliness

Loneliness was assessed using the 3-item UCLA Loneliness Scale (Hughes, Waite, Hawkley & Cacioppo, 2004). Participants responded, on a 3-point scale (1 = ‘rarely’; 2 = ‘sometimes’; 3 = ‘often’), to statements related to loneliness. Responses were summed, with higher scores indicating greater feelings of loneliness (range = 3-9). The scale has shown satisfactory internal consistency, and convergent and discriminant validity in community-based populations of working-age and older adults (Hughes et al., 2004; Rico-Urbe et al., 2016).

Demographic information

Participants were asked to report their gender, age, marital status, number of children and/or grandchildren, and first half of their postcode. Postcode information was coded using the Carstairs index (Brown, Allik, Dundas & Leyland, 2014) to provide an indication of socio-economic status (1 = high deprivation; 5 = low deprivation).

Statistical analyses

To determine whether demographic or main study variables differed significantly between age groups, Chi-square tests of independence for dichotomous variables and independent samples t-tests for continuous variables (with effect sizes calculated using Cohen's *d*) were conducted. For each age group, a series of linear regression analyses were performed to investigate relationships between SLEs, mood, life satisfaction, group identification and loneliness. In order to determine whether relationships differed significantly between age groups, interaction terms between SLEs (past year and lifetime) and age group were created, and entered into bivariate linear regression models with mood and life satisfaction as dependent variables in turn. Moderation analyses were conducted to determine whether group identification or loneliness influenced relationships between numbers of SLEs, mood and life satisfaction. For moderation analyses, past year SLEs, lifetime SLEs, GIS, and loneliness were centred (i.e. the mean was subtracted from each value). Interaction terms between SLEs and group identification and loneliness were entered as the second level in hierarchical regression models with (a) mood and (b) life satisfaction of dependent variables, and centred SLEs and either group identification or loneliness in the first level. Chi-square tests of independence and multiple regression analyses were performed to test whether differences in specific SLEs experienced between age groups had an effect on relationships between SLEs, mood and life satisfaction. All analyses were conducted with IBM SPSS v22.

Results

Demographic information

Descriptive statistics for demographic variables are shown in Table 1. There were significant gender differences between age groups ($p < 0.001$), with more females in the 50-64 age group and more males in the older adult group. More respondents in the 50-64 age group reported being divorced or separated, and more respondents in the older adult group reported being widowed ($p = 0.01$). The older adult group were significantly more likely to have grandchildren ($p = 0.001$). There were no significant age group differences in frequency of having children, number of children or grandchildren, or socio-economic status. [Table 1 near here]

Significant age group differences were found for several study variables (see Table 2 for descriptive results). The 50-64 age group reported significantly more past year SLEs ($p = 0.004$, $d = 0.54$) and had significantly higher depression scores ($p = 0.04$, $d = 0.39$), whereas the older adult group had significantly higher life satisfaction scores ($p = 0.03$, $d = 0.42$). There were no significant age group differences for lifetime SLEs, anxiety, group identification, or loneliness scores. [Table 2 near here]

Relationships between SLEs, mood and life satisfaction

In the 50-64 age group, significant relationships were found between SLEs and depression, anxiety, and life satisfaction (see Table 3). Past year SLEs was a significant predictor of depression ($r(65) = 0.38$, $p = 0.002$), anxiety ($r(65) = 0.41$, $p = 0.001$), and life satisfaction ($r(66) = -0.33$, $p = 0.006$). Similarly, lifetime SLEs was a significant predictor of depression ($r(64) = 0.25$, $p = 0.044$), anxiety ($r(65) = 0.3$, $p = 0.017$), and life satisfaction ($r(66) = -0.3$, $p = 0.016$). In the older adult group, no significant relationships were found between SLEs

(past year or lifetime), and depression, anxiety, or life satisfaction (see table 4).¹ [Tables 3 & 4 near here]

The interaction term of age group and past year SLEs did not significantly predict anxiety ($\beta = 0.12, p = 0.226$), depression ($\beta = -0.01, p = 0.884$), or life satisfaction ($\beta = 0.25, p = 0.435$). The interaction term of age group and lifetime SLEs did not significantly predict anxiety ($\beta = -0.04, p = 0.421$), depression ($\beta = -0.07, p = 0.061$), or life satisfaction ($\beta = 0.11, p = 0.054$). Therefore, effects of numbers of SLEs on mood and life satisfaction did not differ significantly between age groups.

The moderating roles of group identification and loneliness

50-64 age group

Group identification was a significant predictor of depression ($\beta = -0.46, p < 0.001$), anxiety ($\beta = -0.43, p < 0.001$), and life satisfaction ($\beta = 0.35, p = 0.005$). Similarly, loneliness was a significant predictor of depression ($\beta = 0.52, p < 0.001$), anxiety ($\beta = 0.63, p < 0.001$), and life satisfaction ($\beta = -0.57, p < 0.001$). Addition of the interaction terms between SLEs and GIS and loneliness did not significantly improve model fit for anxiety, depression or life satisfaction (all $p > 0.1$).

Over 65 age group

Group identification and loneliness were significant predictors of depression ($\beta = -0.4, p = 0.005$, and $\beta = 0.43, p = 0.002$ respectively) and life satisfaction ($\beta = 0.32, p = 0.026$, and $\beta = -0.52, p < 0.001$ respectively). However, neither group identification nor loneliness were

¹ All analyses were also conducted separately for male and female participants, and the direction of results remained, albeit the strength and significance was reduced.

significant predictors of anxiety. Addition of the interaction terms between SLEs and GIS and loneliness did not significantly improve model fit for anxiety, depression or life satisfaction (all $p > 0.1$).

Specific types of SLEs

There were several age group differences in specific SLEs experienced. SLEs with a difference of 10% or more in percentage frequency experienced by each age group are presented in Table 5. [Table 5 near here]

The 50-64 age group was significantly more likely to report *change in responsibilities at work* ($p = 0.01$), *change in work hours or conditions* ($p = 0.01$), and *change in sleeping habits* ($p = 0.004$) in the past year. Over the lifetime, the 50-64 age group was significantly more likely to report *divorce* ($p = 0.001$), *marital separation* ($p = 0.001$), *sex difficulties* ($p = 0.002$), and *trouble with boss* ($p = 0.002$). These SLEs were not significant predictors of depression, anxiety, or life satisfaction (see Tables 6 & 7 for β -values). [Tables 6 & 7 near here]

The older adult group was significantly more likely to report *death of spouse* ($p = 0.03$), *retirement* ($p < 0.001$), *divorce of a child* ($p = 0.01$), *change in church activities* ($p = 0.01$), and *change in social activities* ($p = 0.01$) over their lifetime. These specific SLEs were not significant predictors of depression, anxiety, or life satisfaction. Divorce of a child, however, was a significant individual predictor of depression ($p = 0.04$) (see Table 8 for β -values). [Table 8 near here]

Discussion

Summary of results

This study found that the 50-64 age group had significantly higher depression and lower life

satisfaction scores than the older adult group. In the 50-64 age group, SLEs (past year and lifetime) were significant predictors of mood and life satisfaction. In the older adult group, there were no significant relationships between SLEs, mood and life satisfaction.

Significant differences existed in specific SLEs experienced between age groups. However, regression models of specific SLEs which differed were not significant in predicting mood or life satisfaction.

This study found that group identification and loneliness were significant predictors of mood and life satisfaction in both age groups, but were not significant moderators of relationships between SLEs, mood and life satisfaction.

Evaluation and implications for practice/future research

In line with previous research (Brown, 2014; Jones et al., 2011), this study found that the 50-64 age group had higher depression and lower life satisfaction than the older adult group. Despite health and social difficulties associated with aging, psychological wellbeing appears to improve from early adulthood to old age (Carstensen et al., 2011). Theories related to development over the lifespan suggest older adults may be more motivated to invest in activities and relationships that are meaningful for them and prioritise emotional goals, leading to greater emotional self-regulation and stability (Carstensen et al., 2011; Scheibe & Carstensen, 2010). However, relationships between psychological outcomes and age across the lifespan may not be linear. Several studies suggest psychological wellbeing follows a U-shaped curve, with poor psychological wellbeing highest in middle age (Blanchflower & Oswald, 2008; Stone, Schwartz, Broderick & Deaton, 2010). The reasons for increased vulnerability among 50-64 year-olds require further investigation but may be related to work fatigue or concerns about getting older and retirement, a life stage older adults are likely to have already adjusted to.

In the 50-64 age group, relationships between SLEs, mood and life satisfaction support previous findings (Hammen, 2005, Kessler, 1997; Tennant, 2002; Kendler et al., 2003), and suggest significant stressors increase risk of psychological distress in line with a stress-vulnerability model of psychopathology development (Goh & Agius, 2010; Ingram & Luxton, 2005; Zubin & Spring, 1977). However, this study did not replicate previous findings of significant relationships in older adults (Djernes, 2006; Fiske et al., 2003; Kraaij et al., 2002; Krause, 2004) as would be expected by the vulnerability hypothesis (Palgi et al., 2015; Solomon & Ginzberg, 1998).

Although there was no statistical support for significant age group differences in the nature of relationships between SLEs, mood and life satisfaction, the finding that there were significant relationships only in the working age group provides support for the inoculation hypothesis of aging. This hypothesis suggests past life experience, increased resilience and greater emotional regulation in older adults reduces risk of poor psychological outcomes following stressors compared to working-age adults (Eysenck, 1983; Palgi et al., 2015; Shrira et al., 2014). Alternatively, it is possible older adults perceive certain SLEs, such as death of a spouse or personal illness, as common features of aging and subsequently normalise their experiences of these stressors, lessening their negative impact on mental health.

In line with previous research (Sani et al., 2015a; Victor et al., 2000; Wakefield et al., 2016), group identification and loneliness were significant predictors of mood and life satisfaction in both age groups. In practice, this suggests clinical interventions which are group-based, or focused on increasing levels of group interaction and feelings of belonging, may help to improve psychological wellbeing for individuals.

However, the prediction that relationships between SLEs, mood and life satisfaction would be moderated by group identification and loneliness was not supported. Given previous findings of significant moderation of these relationships by social support (Kraaij et

al., 2002; Melchiorre et al., 2012), this warrants further investigation to determine which factors are implicated and develop a theoretical model of inter-relationships. This would be valuable for clinical practice as interventions to increase protective factors may help to buffer individuals from poor psychological outcomes following experience of SLEs.

The finding that age group differences in specific SLEs experienced did not significantly predict mood or life satisfaction supports previous research that number of SLEs is more strongly related to mood and life satisfaction (Kraaij et al., 2002). However, interestingly, one SLE, '*divorce of a child*', was a significant independent predictor of depression in the older adult group. Small sample size ($n = 8$) limits the power of this finding, particularly given number of SLEs was not related to depression in this age group. However, divorce or marital separation of an adult child has been linked with reduced contact and closeness with grandchildren, resulting in feelings of stress and loss, and emotional problems (Drew & Smith, 1999; Westphal, Poortman & Van der Lippe, 2015). The impact of divorce of a child on older adult wellbeing warrants further investigation as it may be beneficial for mental health professionals to ask older adults about their children, and related stressors such as divorce, when undertaking psychological assessment.

Whilst 13 participants reported symptoms within the clinical range of mild-to-moderate depression and 40 participants reported symptoms of mild-to-severe anxiety, mean depression and anxiety scores were low, within the non-clinical range of symptomatology. Additionally, whilst this study investigated two age groups, 50-64 year-olds appear to be particularly vulnerable to low mood and life satisfaction compared to other age groups (Brown, 2014; Jones et al., 2011). It would be valuable to extend this research in clinical populations and with other age groups.

The findings of this study suggest it may be helpful to take age and number of SLEs experienced into account during psychological screening and assessment to help to identify

individuals in need of further support early, improving outcomes for individuals and reducing demand on specialist services. Clinicians may benefit from exploring number of SLEs experienced, rather than focusing on the impact of specific SLEs on mental health, during psychological assessment.

Study strengths and limitations

This study has extended previous research in several ways. Use of a community-based sample of older adults and adults aged 50-64 years allowed for comparison of relationships between SLEs, mood and life satisfaction between two age groups. Participant scores for each measure varied over a medium-to-wide range, suggesting the sample was fairly diverse in respect to key variables. Additionally, use of measures validated in both working-age and older adult populations increased reliability and validity of current findings.

The retrospective, cross-sectional nature of this study is a limitation. Accuracy of retrospective recall has been disputed by researchers (Krause, 2004), individuals with depression tend towards negative autobiographical memories (Dalgleish & Watts, 1990; Joormann & Quinn, 2014), and older adults have been found to have a positivity bias towards autobiographical memories (Kennedy, Mather & Carstensen, 2004; Scheibe & Carstensen, 2010). In this study, several lifetime SLEs which would likely be fairly common – such as *sex difficulties*, *trouble with boss*, and *minor mortgage or loan* – were reported by fewer older adults than 50-64 year-olds. This suggests the older adult group may have been less likely than the 50-64 age group to recall all SLEs they had experienced. Future research may benefit from longitudinal designs to track changes in relationships with SLEs over time.

The use of self-report measures may have been resulted in social desirability bias. However, Krumpal (2013) found individuals were more likely to respond accurately to sensitive, personal questions when data collection involved self-reported, rather than

interviewer-administered, questionnaires. The participant sample may also have been non-representative due to self-selection bias. Cohort or cultural factors may have influenced levels of psychological wellbeing or responses differentially between age groups, although this likelihood was minimised by the groups being as close in age as possible. Whilst the recruitment and data collection methods used were the most appropriate for this study, such factors should be taken into account when interpreting findings.

The relatively small sample size ($n = 121$) is a limitation, particularly given previous studies had larger sample sizes and the study did not replicate previous findings of significant relationships in older adults. However, previous effect sizes for older adults have been small and the effect size for past year SLEs and depression was similar to that found previously in a meta-analysis by Kraaij et al. (2002) ($r = 0.15$ compared to $r = 0.112$). The small number of male participants ($n = 29$) and small sample size for specific SLEs also limits findings. Further investigation to elucidate findings in a larger and more representative sample is warranted.

Conclusion

This study supports previous findings of relationships between SLEs, mood and life satisfaction in working-age adults. In contrast, there were no significant relationships between SLEs, mood and life satisfaction in the older adult group, supporting the inoculation hypothesis of aging. Group identification and loneliness were significantly related to mood and life satisfaction scores in both age groups, but were not significant moderators of relationships between SLEs, mood and life satisfaction. This study extends previous findings and suggests avenues for future research, particularly in understanding how these relationships change over the lifespan and inter-relationships with other variables. Such research is valuable for clinical practice, particularly in considering number of SLEs

experienced during psychological assessment and developing interventions to increase psychological wellbeing.

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Table 1. Descriptive results of demographic variables overall and for each age group.

| Participant characteristic | Total sample | 50-64 age group | Older adult group |
|---|--------------|-----------------|-------------------|
| Gender <i>n</i> (%) | | | |
| Male | 29 (24.4) | 9 (12.9) | 20 (40.8) |
| Female | 89 (74.8) | 61 (87.1) | 28 (57.1) |
| Prefer not to say | 1 (0.8) | 0 (0.0) | 1 (2.0) |
| Marital status <i>n</i> (%) | | | |
| Married/ domestic partnership | 80 (66.1) | 46 (64.8) | 34 (68.0) |
| Divorced | 15 (12.4) | 12 (16.9) | 3 (6.0) |
| Separated | 4 (3.3) | 4 (5.6) | 0 (0.0) |
| Single | 9 (7.4) | 6 (8.5) | 3 (6.0) |
| Widowed | 13 (10.7) | 3 (4.2) | 10 (20.0) |
| Has children <i>n</i> (%) | | | |
| Yes | 97 (80.2) | 54 (76.1) | 43 (86.0) |
| No | 24 (19.8) | 17 (23.9) | 7 (14.0) |
| If yes, how many <i>M</i> [<i>SD</i>] | 2.43 [2.74] | 2.21 [3.68] | 2.69 [3.90] |
| Has grandchildren <i>n</i> (%) | | | |
| Yes | 59 (49.6) | 26 (37.1) | 33 (67.3) |
| No | 60 (50.40) | 44 (62.9) | 16 (32.7) |
| If yes, how many <i>M</i> [<i>SD</i>] | 3.24 [2.39] | 2.58 [2.84] | 3.77 [1.83] |
| Carstairs quintile <i>M</i> [<i>SD</i>] | 3.17 [1.31] | 3.13 [1.22] | 3.22 [1.44] |

n = sample size, *M* = mean, *SD* = standard deviation

Table 2. Sample size, mean, and standard deviation of study variables for each age group.

| Measure | 50-64 age group | | | Older adult group | | |
|----------------------|-----------------|----------|-----------|-------------------|----------|-----------|
| | <i>n</i> | <i>M</i> | <i>SD</i> | <i>n</i> | <i>M</i> | <i>SD</i> |
| Past year SLEs | 67 | 2.48 | 3.43 | 47 | 0.98 | 1.97 |
| Lifetime SLEs | 67 | 14.04 | 6.78 | 47 | 13.11 | 6.49 |
| Depression | 64 | 4.45 | 3.25 | 48 | 3.35 | 2.27 |
| Anxiety | 65 | 6.75 | 3.98 | 48 | 6.27 | 3.38 |
| Life satisfaction | 66 | 11.17 | 4.35 | 48 | 13.06 | 4.72 |
| Group identification | 63 | 1.76 | 0.98 | 48 | 2.06 | 0.95 |
| Loneliness | 63 | 5.05 | 2.00 | 48 | 4.33 | 1.87 |

n = sample size, *M* = mean, *SD* = standard deviation

Table 3. Standardised regression coefficients (β) between study variables for the 50-64 age group.

| Variable | Lifetime SLEs | Depression | Anxiety | Life satisfaction |
|-------------------|---------------|------------|---------|-------------------|
| Past year SLEs | .30* | .38** | .41** | -.33** |
| Lifetime SLEs | | .25* | .30* | -.30* |
| Depression | | | .74*** | -.75*** |
| Anxiety | | | | -.58*** |
| Life satisfaction | | | | |

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

Table 4. Standardised regression coefficients (β) between study variables for the older adult group.

| Variable | Lifetime SLEs | Depression | Anxiety | Life satisfaction |
|-------------------|---------------|------------|---------|-------------------|
| Past year SLEs | .02 | .11 | .25 | <.01 |
| Lifetime SLEs | | -.07 | -.08 | .04 |
| Depression | | | .39** | -.66*** |
| Anxiety | | | | -.46** |
| Life satisfaction | | | | |

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

Table 5. Specific SLEs, experienced in the past year or lifetime, with $\geq 10\%$ difference in percentage frequency between age groups.

| Specific SLEs | | 50-64 age group (<i>n</i> = 71) | Older adult group (<i>n</i> =50) |
|---------------|------------------------------------|--|---|
| Past year | Change in health of family member | 21.1 | 10.0 |
| SLEs | Change in financial state | 14.1 | 4.0 |
| | Change in responsibilities at work | 12.7 | 0.0 |
| | Change in work hours or conditions | 12.7 | 0.0 |
| | Change in sleeping habits | 19.7 | 2.0 |
| | Lifetime | Death of spouse | 4.2 |
| SLEs | Divorce | 40.8 | 14.0 |
| | Marital separation | 35.2 | 10.0 |
| | Marriage | 64.8 | 54.0 |
| | Retirement | 15.5 | 74.0 |
| | Injury/illness of spouse | 19.7 | 34.0 |
| | Divorce of a child | 2.8 | 16.0 |
| | Sex difficulties | 23.9 | 8.0 |
| | Children leaving home | 49.3 | 60.0 |
| | Trouble with boss | 32.4 | 12.0 |
| | Change in recreation | 33.8 | 48.0 |
| | Change in church activities | 14.1 | 32.0 |
| | Change in social activities | 28.2 | 52.0 |
| | Minor mortgage or loan | 21.1 | 10.0 |

Table 6. Standardised regression coefficients (β) between past year SLEs and outcome variables for the 50-64 age group.

| Past year SLEs | Depression | Anxiety | Life satisfaction |
|------------------------------------|------------|---------|-------------------|
| Change in responsibilities at work | -.02 | .02 | .06 |
| Change in work hours or conditions | -.10 | -.09 | .03 |
| Change in sleeping habits | .01 | -.001 | -.03 |

* $p < 0.05$, ** $p < 0.01$.

Table 7. Standardised regression coefficients (β) between lifetime SLEs and outcome variables for the 50-64 age group.

| Lifetime SLEs | Depression | Anxiety | Life satisfaction |
|--------------------|------------|---------|-------------------|
| Divorce | -.08 | -.01 | .12 |
| Marital separation | .10 | .12 | .02 |
| Sex difficulties | .01 | -.12 | .04 |
| Trouble with boss | -.12 | -.14 | -.10 |

* $p < 0.05$, ** $p < 0.01$.

Table 8. Standardised regression coefficients (β) between lifetime SLEs and outcome variables for the older adult group.

| Lifetime SLEs | Depression | Anxiety | Life satisfaction |
|-----------------------------|------------|---------|-------------------|
| Death of spouse | -.32 | .04 | .17 |
| Retirement | -.05 | -.01 | -.04 |
| Divorce of a child | .34* | .32 | -.32 |
| Change in church activities | .12 | -.02 | -.03 |
| Change in social activities | -.01 | -.13 | .07 |

* $p < 0.05$, ** $p < 0.01$.