Coversheet

This is the accepted manuscript (post-print version) of the article.

Contentwise, the accepted manuscript version is identical to the final published version, but there may be differences in typography and layout.

How to cite this publication

Please cite the final published version:

Jensen, RAA, Kirkegaard Thomsen, D, O'Connor, M, Mehlsen, MY. Age differences in life stories and neuroticism mediate age differences in subjective well-being. *Appl Cognit Psychol*. 2019; 1– 12.

<https://doi.org/10.1002/acp.3580>

Publication metadata

Title:	Age differences in life stories and neuroticism mediate age differences in subjective well-being
Author(s):	Rikke A. A. Jensen, Dorthe Kirkegaard Thomsen, Maja O'Connor, & Mimi Mehlsen
Journal:	Applied Cognitive Psychology
DOI/Link:	https://doi.org/10.1002/acp.3580
Document version:	Accepted manuscript (post-print)

This is the peer reviewed version of the above article, which has been published in final form at <https://doi.org/10.1002/acp.3580>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions.

General Rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

If the document is published under a Creative Commons license, this applies instead of the general rights.

Age Differences in Life Stories and Neuroticism Mediate Age Differences in Subjective Well-Being

Rikke A.A. Jensen^{1,2}, Dorthe Kirkegaard Thomsen^{1,2}, Maja O'Connor^{1,3} & Mimi Y. Mehlsen^{1,4}

¹Department of Psychology, Aarhus University

²Center on Autobiographical Memory Research (CON AMORE), Aarhus University

³Unit for Bereavement Research, Aarhus University

⁴Unit for Psychooncology and Health Psychology, Aarhus University

Author note

Rikke A.A. Jensen, Aarhus University, Dorthe Kirkegaard Thomsen, Aarhus University, Maja O'Connor, Aarhus University, Mimi Y. Mehlsen, Aarhus University,

Thanks to Astrid Geisler and Søren Madsen for their help with recruiting participants and to Kaare Bro Wellnitz for statistical assistance. The study was supported by a grant from the velux foundation to the second author (VELUX33266). The first and second authors are affiliated with con amore, which is funded by the Danish National Research Foundation (DNRF) Grant DNRF93.

Corresponding author: Rikke A.A. Jensen, Department of Psychology, Aarhus University, Bartholins Allé 9, DK-8000 Aarhus C, rjensen@psy.au.dk

Abstract

We examined whether age differences in life stories and personality traits mediated age differences in subjective well-being. One-hundred-and-one young, 77 middle-aged, and 81 older participants completed measures of subjective well-being and personality traits. They described chapters and specific memories in their life stories and rated these on emotional tone and positive and negative self-event connections. Older participants scored higher on subjective well-being, rated their life stories as more positive, and scored lower on neuroticism compared with both young and middle-aged participants. Age differences in subjective well-being were mediated by life stories and neuroticism, with neuroticism being the strongest mediator. We suggest that changes in personality may enable older individuals to interpret events and themselves in a positive light, which help enhance their subjective well-being.

Keywords: Age differences, life stories, self-event connections, personality traits, subjective well-being

Age Differences in Life Stories and Neuroticism Mediate Age Differences in Subjective Well-Being

1. Introduction

While old age is linked to biological, physiological, and cognitive decline, older adults report higher levels of subjective well-being (SWB), defined as higher levels of life satisfaction and positive affect, and lower levels of **negative** affect, compared with young and middle-aged adults (Blanchflower & Oswald, 2008; Diener & Suh, 1998; Frijters & Beaton, 2012). This finding has been termed “the paradox of aging”.

Research indicates that personality is one of the strongest predictors of individual differences in SWB (Diener, Suh, Lucas, & Smith, 1999). For example, personality traits, and especially the traits of neuroticism and extraversion, have been found to account for substantial variation in SWB (Steel, Schmidt, & Schulz, 2008). However, following McAdams' (1996) model of personality, a full understanding of personality must draw upon traits as well as *life stories*, and a recent review suggests that life stories are related to SWB beyond the effects of personality traits (Adler, Lodi-Smith, Philippe, & Houle, 2016).

Because differences in personality explain differences in SWB, it is possible that age differences in personality explain age differences in SWB. That is, the relationship between age and SWB may not be a direct effect but operate through age differences in personality. However, from an empirical point of view, efforts to simultaneously address different aspects of personality as determinants of SWB are scarce and lack a life span perspective. The present study aims to examine age differences in life stories and personality traits and test whether such age differences in personality mediate age differences in SWB in three groups of young, middle-aged, and older adults. Understanding how age differences in personality are related to age

differences in SWB is a first step towards illuminating potential age-related changes in personality, that enhance SWB in older adults.

1.1. Personality Traits, Subjective Well-Being, and Age Differences

Personality has been suggested to consist of three separate aspects: 1) stable inborn characteristics, such as personality traits; 2) context-dependent expressions of personality, such as goals and values; and 3) dynamic life stories that provide temporally, causally, and thematically coherent accounts of past, present, and future including interpretations of how events in life have shaped the individual (Habermas & Bluck, 2000; McAdams, 1996). The aspects thus categorize personality according to context dependence and stability, with personality traits believed to be very stable and consistent across contexts and life stories described as more changeable and context-sensitive. Although separate, the aspects interact: Studies have shown that personality traits are related to the way individuals construct their life stories (McAdams et al., 2004; Raggatt, 2006; Thomsen, Olesen, Schnieber, & Tønnesvang, 2014). Still, the different aspects of personality may independently explain variance in SWB (Adler et al., 2016). Here, we focus on personality traits and life stories, because they span the full dimension of stable and dynamic aspects of personality and are thus particularly interesting when examining potential age differences in personality that may explain age differences in SWB.

Most research on the relation between personality and SWB has focused on personality traits. There is abundant evidence pointing to strong associations between neuroticism, extraversion, and SWB. Specifically, neuroticism is associated with lower levels of SWB, while extraversion is associated with higher levels of SWB (see meta-analysis by Steel, Schmidt, & Schulz, 2008).

Research on age differences in personality traits indicates that, when comparing young, middle-aged, and older adults, conscientiousness and agreeableness show positive age trends, extraversion and openness to experience show flat trends, and neuroticism shows a negative age trend (Roberts, Walton, & Viecithbauer, 2006; Soto, John, Gosling, & Potter, 2011). Since neuroticism is negatively related to SWB and since older adults score lower on neuroticism compared with younger adults, it may be that age differences in neuroticism mediate the age differences in SWB.

In one study, Mroczek and Kolars (1998) examined whether the age difference in neuroticism mediated the age differences in positive and negative affect. Although there was a significant inverse relationship between age and neuroticism, such that higher age was associated with lower levels of neuroticism, this relationship did not mediate the relationship between age and SWB. Although age differences in neuroticism did not explain the age differences in positive and negative affect in the study by Morczek and Kolars (1998), it is possible that other aspects of personality may explain why older individuals have higher levels of SWB compared with younger individuals. Here, we focus on life stories, because life stories are reconstructed throughout the life span (McAdams, 1993) making them good candidates for explaining age differences in SWB. In addition, there is convincing evidence that life stories, as part of personality, are related to SWB, and that life stories predict SWB even when controlling for personality traits (Adler et al., 2016).

1.2. Life Stories and Subjective Well-Being

The life story is an internalized and evolving self-narrative that a person works on over the course of life, which is central to identity (McAdams, 1996). To construct life stories individuals engage in autobiographical reasoning, a specific type of self-reflection, where

individuals consider how important events have shaped the self (Habermas & Bluck, 2000; McAdams, 2001; Fivush, 2007). Such reasoning creates connections between events and the self, termed *self-event connections* (Habermas & Bluck, 2000; Pasupathi, Mansour, & Brubaker, 2007). Two distinct types of self-event connections have been identified: One include explaining personal stability across time by declaring past events as illustrating personal characteristics, termed *stability connections* (e.g., “I played soccer for many years [event], because being a part of a group has always been important to me [stability connection]”). The other is based on explaining how past events have changed the self across time, termed *change connections* (e.g., “Having children [event] has made me more aware of how fragile life is [change connection]”). We suggest that the distinction between change and stability connections is further nuanced by emotional tone, that is, whether these connections emphasize positive or negative self stability and change (Banks & Salmon, 2013; Lilgendahl & McAdams, 2011). In other words, when we interpret how past events are linked to who we are today, these links may be either positive or negative. With respect to stability connections, the narrator may use past events to underscore how he or she has stayed the same in a positive or negative way (i.e. positive or negative stability connections). For example an individual may interpret playing soccer as showing either how she/he is sociable [positive stability] or lacks independence [negative stability]. With respect to change connections, the narrator may describe an event as leading to an improvement in his or her personality, or as contributing to some kind of characterological regression (i.e. positive or negative change connections). For example, a woman suffering from a serious illness may interpret it as making her realize what was important in her life [positive change] or/and as having lost

confidence in her health [negative change]. Based on this conceptual analysis, we examined four types of self-event connections in life stories: Positive stability connections, negative stability connections, positive change connections, and negative change connections. More use of positive self-event connections and less use of negative self-event connections result in more positive life stories and hence we will refer to the positivity of life stories, when discussing the combined effects of the four types of self-event connections.

Studies that have used content coding when relating self-event connections in life stories to SWB have primarily investigated positive and negative change connections. Positive change connections have been examined as growth or redemption sequences and negative change connections have been examined as contamination sequences. In two studies, McAdams, Reynolds, Lewis, Patten, and Bowman (2001) showed that a high density of redemption sequences in life stories, that is, where an emotionally negative life scene is interpreted as having positive consequences for the narrator, was related to higher levels of life satisfaction and lower levels of depression. Similarly, several other studies have found that the narration of growth or learning a positive lesson from negative life experiences is related to higher levels of SWB (Bauer & McAdams, 2004a; 2004b; King, Scollon, Ramsey, & Williams, 2000; Lilgendahl & McAdams, 2011; Pals, 2006). By contrast, a high density of contamination sequences in life stories, that is, sequences where the narrator scripts the move from an emotionally positive scene to a negative outcome, is related to higher levels of depression (McAdams et al., 2001, study 1; Adler, Kissel, & McAdams, 2006). While growth, redemption-, and contamination sequences differ from our conceptualizations of positive and negative change connections, the studies indicate that the emotional tone of change connections is important to SWB.

Although content coding is the most commonly used method in life story research, recent discussions suggest that self-report methods may be a useful supplement (Holm & Thomsen, 2018; McAdams, 2018; Panattoni & McLean, 2018). The rationale behind self-report methods is that life stories are *internalized* accounts that participants can introspectively assess on consciously accessible qualities, such as positive self-change (Holm & Thomsen, 2018; Panattoni & McLean, 2018). Self-report methods take seriously the subjective nature of life stories in letting participants themselves evaluate how they think and feel about their life stories, rather than using experts to content code the life stories. Studies assessing self-event connections through self-report have found results similar to studies based on content coding. For example, Thomsen and colleagues (Thomsen et al., 2016) found that lower self-report ratings of positive change connections were related to more symptoms of depression and higher trait-anxiety. Holm and Thomsen (2018) found that individuals who gave higher ratings of positive self-event connections and lower ratings of negative self-event connections, experienced fewer symptoms of psychopathology. Additionally, compared with healthy control participants, individuals with psychiatric illness rate their life stories lower on positive self-event connection (Lind, Jørgensen, Bøye, Heinskou, Simonsen, & Thomsen, 2018; Pedersen, Straarup, & Thomsen, 2018).

Given that 1) individuals are likely aware of the emotional tone and self-event connections in their life stories and hence can self-report on these life story characteristics and 2) previous studies on self-event connection using self-report have found results similar to content coding, we asked our participants to self-report these characteristics of their life stories. We expected that higher ratings of positive and lower

ratings of negative self-event connections in life stories would be associated with higher SWB.

1.3. Life Stories and Age Differences

Life stories are assumed to change over the life span (McAdams, 1993) and hence age differences in life stories should be expected. If life stories change in ways that support higher SWB, they may explain why older adults report higher SWB compared to younger adults. There are surprisingly few studies of age differences in life stories, but one important study examined age differences in change and stability connections (McLean, 2008). Using content coding of stability and change connections in self-defining memories of young and older adults, she found that young adults constructed the self more in terms of change and older adults constructed the self more in terms of stability. She argued that the age differences reflected differential identity concerns with young adults focusing on identity development and older adults focusing on maintaining identity in the face of age-related losses. The study, however, did not assess the emotional tone of self-event connections, which might be especially important in relation to SWB.

Previous studies on adult age differences in the emotional tone in life stories show mixed findings. Thomsen and colleagues found that middle-aged adults had less positive life story chapters compared with younger adults (Thomsen et al., 2014). In another study, no correlation was found between age and the emotional tone of life story chapters (Thomsen, Lind, & Pillemer, 2017). However, research examining evaluations in response to autobiographical events have found that older adults tend to evaluate past events more positively and less negatively compared with younger adults (Charles, Mather, & Carstensen, 2003). This age-related shift in attention to positive over negative evaluations has been termed the positivity effect and has been replicated in many studies (see meta-analysis by Reed, Chan, & Mikels,

2014). According to the socioemotional selectivity theory, the positivity effect reflects older adults' focus on increasing well-being in the present. Socioemotional selectivity theory contends that when time horizons become limited, as they typically do with age, people become more focused on savoring and emotional meaning (Charles, Mather, & Carstensen, 2003). Hence, older adults adopt a range of emotion-regulation strategies that help maximize emotional well-being (Knight et al., 2007). One such emotion-regulation includes interpretation of events, a concept similar to positive self-event connections. By narrating events in ways that elaborate on positive self-event connections older adults could gain higher well-being (Pasupathi et al., 2015).

Based on these ideas, we expected that older adults would have higher levels of positive self-event connections, especially positive stability connections, and lower levels of negative self-event connections compared with young and middle-aged adults.

1.4 Overview of the Present Research

Older adults experience higher well-being than younger adults. One possible explanation for this is that older adults' personality may have changed to support better well-being. We examine whether older adults display lower levels of neuroticism and narrate their lives in more positive ways compared to younger adults and whether these age differences in personality explain age differences in well-being. We examined this idea using mediation analyses, expecting that age differences in personality would mediate age differences in well-being. Following established guidelines for mediation (Hayes, 2018), we first examined age differences in SWB, expecting older adults to score higher on SWB than young and middle-aged adults. Second, we examined age differences in personality, expecting older adults to report lower neuroticism and have

more positive life stories than young and middle-aged adults. Third, we examined relations between personality and SWB, predicting that lower neuroticism and more positive life stories would be related to higher SWB. Finally, we tested the full mediation model, expecting that age differences in personality traits and life stories would mediate age differences in SWB.

2. Methods

2.1. Recruitment and Participants

Participants were recruited through electronically distributed material to local schools and on social network sites advertising for participants between the ages of 20-25 years; 45-50 years and 65-70 years. The material briefly described the study and directed those interested to a study website for more information about how to participate. Participants then referred themselves to the study via email. They received a link to the online questionnaire containing the materials described below. If participants did not complete the questionnaire within three weeks, they received a reminder to complete the questionnaire. After completion, participants were debriefed and received a gift card of 100 DKK (approximately 15 USD).

In total, 361 participants referred themselves to the study, but 79 participants failed to answer all questions and 25 participants never opened the questionnaires (28% drop-out rate). The final sample thus consisted of 259 participants, with 101 participants in the young group, 77 participants in the middle-aged group, and 81 participants in the old group. The sample size allows for detection of age differences with small to medium effect sizes with a power of .80 and a α of .05.

2.2. Measures

The Life Story Questionnaire. When individuals construct life stories, they include both chapters and specific memories (McAdams, 1993; Thomsen, 2009), and hence we asked

participants in our study to identify up to ten chapters and up to ten specific memories that were important to their life story (following Thomsen & Berntsen, 2008). A chapter was described as an “extended time period in your life that need not have a clear-cut beginning or end”. Participants were informed that they could “include chapters that are parallel, that is, they may be referring to the same period in your life. You are also welcome to include chapters that you feel are not completed yet”. A specific memory was described as a “memory of an event lasting no more than 24 hours”. Participants were instructed to start with the chapter/specific memory that first came to mind, to give each chapter/specific memory a heading, and to briefly describe the content of the chapter/specific memory. Then they were asked to give their best estimate for their age at the beginning and the end of the chapter (or mark it as ongoing)/their age at the time of the event in the specific memory. Participants were asked to answer separate questions about the positive and negative emotional tone of the chapter/specific memory, and the positive and negative tone of stability and change connections associated with the chapter/specific memory (see Table 1). All questions were rated on a 5-point scale (1 = not at all; 5 = very much). The questions have shown good validity in previous studies. For example, we have found that the questions relate in predictable and theoretically meaningful ways to personality traits and self-esteem (Thomsen & Pillemer, 2017), self-esteem and self-concept clarity (Steiner, Thomsen, & Pillemer, 2017), SWB (Thomsen, Lind, & Pillemer, 2017), symptoms of psychopathology and self-concept clarity (Holm & Thomsen, 2018), and bipolar disorder (Pedersen, Straarup, & Thomsen, 2018).

To calculate a mean score for each participant on each of the six life story variables, we summed items for positive tone, negative tone, positive stability

connections, negative stability connections, positive change connections, and negative change connections, respectively, across chapters and specific memories. Each participant's six sum scores were then divided by his or her total number of chapters and specific memories.

Subjective Well-Being. SWB was measured using three self-report indicators. To measure life satisfaction, we used The Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), which is designed to measure global cognitive judgments of satisfaction with one's life. The five items are rated on 1-7 point scales, with higher scores indicating higher life satisfaction. This scale is a widely used measure of SWB, and has been translated and validated in Danish (Mehlsen et al., 2005). The internal reliability in this study was good (Cronbach's $\alpha = .87$).

To measure well-being, we used the World Health Organization-Five Well-Being Index (WHO-5 Well-Being Index; Bech, 2012), which consists of five positively worded items related to current well-being. The items are rated on 1-6 point scales, with higher scores indicating higher levels of well-being. The WHO-5 Index was originally developed in Denmark, and has been translated and validated in many other countries (Bech, 2012). The internal reliability in this study was good (Cronbach's $\alpha = .86$).

Negative affect was measured using the two subscales of depression and anxiety from The Common Mental Disorder Questionnaire (CMDQ; Christensen et al., 2005). The depression subscale consists of six items measuring symptoms of depression, while the anxiety subscale consists of four items measuring symptoms of anxiety. All items are rated on 1-5 point scales, with higher scores indicating higher levels of symptoms. The CMDQ-index is a Danish instrument and it has been validated in a Danish sample (Bilberg, Nørgaard, Roessler, & Overgaard, 2014) and shows good psychometric qualities (Christensen et al., 2005). Because we

were interested in negative affect and because the two subscales were highly correlated, we used the total score in subsequent analyses. The internal reliability in this study was good (Cronbach's alpha = .90). We will refer to these three measures as life satisfaction, well-being, and negative affect.

Personality traits. We used the Danish version of the NEO-FFI (Costa et al., 2004) to measure the Big Five personality traits. The NEO-FFI consists of 60 items measuring the traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness with 12 items each. The items are answered on 1-5 point scales, where a higher score indicate a higher degree of the trait. The internal reliabilities for the subscales in this study were satisfactory. Cronbach's alphas: .87 (neuroticism), .83 (extraversion), .73 (openness), .73 (agreeableness), and .84 (conscientiousness).

3. Results

3.1. Preliminary analyses

Mean ages, gender, and sociodemographic variables for the three groups are shown in Table 1. Chi-square tests were utilized to assess differences on categorical demographical variables as a function of age group, and showed a significant difference between the three groups on gender (Pearson $\chi^2 = 16.42$, $df = 2$, $p < .001$) and highest education (Pearson $\chi^2 = 136.58$, $df = 12$, $p < .001$). There were more women in the middle-aged group compared with the young and old group and the young group were more likely to report high school as their highest level of education (however, 85% of the young adults were engaged in further education).

To examine whether gender was related to SWB, personality traits, and the life story variables, we conducted a series of independent t-tests (see Table 3). In summary,

the tests showed no effect of gender on SWB; women scored significantly higher on neuroticism and agreeableness compared with men; and in relation to the life story variables, the only significant difference was that women scored significantly higher on negative tone compared with men. Since there were no gender differences in SWB, we did not control for gender in the mediation analyses.

To examine whether education was related to SWB, personality traits, and the life story variables, we conducted a series of 1-way ANOVAS. There were only significant differences for openness, conscientiousness, and agreeableness ($ps < .05$, contact first author for detailed analyses). Since there were no effect of education on SWB, we did not control for education in the mediation analyses.

3.2. Age Differences in SWB, Life Stories, and Personality Traits

All means and standard deviations are shown in Table 4. Significant differences among age groups were obtained for all three SWB measures. Bonferroni corrected post hoc tests showed that older adults scored significantly higher on life satisfaction and well-being, and significantly lower on negative affect compared with middle-aged and young adults. There were no significant differences in SWB between middle-aged and young adults. Thus, for our mediation analyses we will focus on examining whether life stories and personality traits explain SWB differences between the older group on the one hand, and the young and middle-aged groups on the other hand. Hence, when we examine age differences in the mediator variables (i.e. life stories and personality traits), we will focus on comparing the older group with the young group and comparing the older group with the middle-aged group and ignore age differences in life stories and personality traits between the young and the middle-aged group.

This is because there is no age difference between the young and the middle-aged group in SWB to be mediated by age differences in life stories and personality traits.

Analyses of variance showed that the three groups did not differ significantly on number of chapters, $F(2, 256) = .45, p > .05$, or number of specific memories, $F(2, 256) = 2.80, p > .05$. This suggests comparable engagement in the task across age groups.

Significant differences among age groups were obtained for negative tone (note that this effect remained significant when co-varying gender, contact first author for detailed analyses), positive stability connections, negative stability connections, and negative change connections. Bonferroni corrected post hoc tests showed that compared with young adults, older adults scored significantly higher on positive stability connections and significantly lower on negative change connections ($ps < .05$). Compared with middle-aged adults, older adults scored significantly lower on negative tone, negative stability connections, and negative change connections ($ps < .05$). In addition, compared with young adults, middle-aged adults scored significantly higher on negative tone. Thus, middle-aged adults constructed more negative life stories than the young group, and older adults constructed more positive life stories than both younger groups by emphasizing positive stability connections and deemphasizing negative tone, negative stability connections, and negative change connections.

In regards to personality traits, analyses of variance showed significant differences among age groups on agreeableness, conscientiousness, and neuroticism. Bonferroni corrected post hoc tests showed that, compared with young adults, older adults scored significantly higher on agreeableness and conscientiousness, and significantly lower on neuroticism. Compared with middle-aged adults, older adults

scored significantly lower on neuroticism. Compared with young adults, middle-aged adults scored higher on agreeableness (see Table 4).

The above analyses established that the predictor variable (age) is related to the outcome variable (SWB), that is, the older group scored higher on SWB than the two other groups. The analyses also established that the predictor variable (age) was related to the mediator variables (traits and life stories), that is, the older group described more positive life stories and scored significantly lower on neuroticism compared with the two other groups (as well as higher conscientiousness and agreeableness compared with the young group).

3.3. The Relationship between Life Stories, Personality Traits, and Subjective Well-Being

To examine whether life stories were related to SWB, we conducted a series of correlations in the full sample, summarized in Table 5. As predicted, higher positive tone and more positive self-event connections were related to higher SWB. Conversely, higher negative tone and more negative self-event connections were related to lower SWB.

With respect to personality traits, our findings replicate previous studies indicating that higher scores on extraversion and conscientiousness were related to higher SWB, while higher scores on neuroticism were related to lower SWB.

In addition, the correlations between life stories and personality traits also replicate previous findings. Higher scores on neuroticism was related to rating life stories higher on negative tone and negative self-event connections and lower on positive tone and positive self-event connections. Extraversion and conscientiousness were related to higher scores on positive tone and positive self-event connections and lower ratings of negative tone and negative self-event connections.

3.4. Age Differences in Life Stories and Personality Traits Mediate Age Differences in SWB

So far we have shown that 1) the older group scored higher on SWB compared with the two other groups; 2) the older group described more positive life stories and had lower scores on neuroticism compared with the young and middle-aged group (in addition to higher scores on conscientiousness compared with the young group); and 3) the positivity of life stories, neuroticism, and conscientiousness are associated with SWB. In order to examine whether life stories and personality traits mediate age differences in SWB, we conducted a series of mediation analyses using model 4 in the process macro file for SPSS (Hayes, 2018), where the significance of the indirect effect is tested using bootstrapping procedures. In all models, mediation was investigated by testing the significance of the indirect effect of the predictor variable on the outcome variable through the mediators. This indirect effect was quantified as the product of the effects of the predictor variable on the mediator and of the mediator on the outcome variable, controlling for the direct effect of the predictor variable. Bootstrapping estimated indirect point effects and associated 95% confidence intervals (CI) were derived from the mean of 5.000 bootstrap samples. Indirect effects were deemed statistically significant when the bias correct CI did not include zero (Hayes, 2018).

We conducted separate analyses for each of the three SWB measures, entering these as the outcome variable. Age group was entered as the predictor variable. Because the older group differed from the young and the middle-aged group on different mediator variables (e.g., life stories and personality traits), we first conducted analyses comparing the young and the older group (models 1a, 2a, and 3a), and then analyses comparing the middle-aged and the older group (models 1b, 2b, and 3b). For both comparisons (young versus old and middle-aged versus old), we tested three different mediation models. We

first tested mediation effects of the life story variables (models 1a and 1b), we then tested mediation effects of personality traits (models 2a and 2b), and finally, we tested mediation of personality traits and life stories together in the same model (models 3a and 3b). This strategy allowed us to disentangle the potential mediational effects of life stories and personality traits.

Concerning the comparison between young and older adults, we entered age group (1 = young adults, 3 = older adults) as the predictor variable. Because older adults scored higher on positive stability connections and lower on negative change connections than young adults, these variables were entered at the mediator level in model 1a. Older adults scored lower on neuroticism and higher on conscientiousness compared with young adults, thus neuroticism and conscientiousness were entered at the mediator level in model 2a (although older adults also scored significantly higher on agreeableness compared with young adults, we did not test agreeableness as a mediator, since it was not related to SWB). Finally, in model 3a, positive stability connections, negative change connections, neuroticism, and conscientiousness were entered together at the mediator level (see Table 6). The models show that when the mediators are entered in separate models, positive stability, negative change, and neuroticism each significantly mediate age differences in the SWB measures. When entered simultaneously, only positive stability connections and neuroticism significantly mediated age differences in life satisfaction. For well-being and negative affect, only neuroticism significantly mediated age differences.

Concerning the comparison between middle-aged and older adults, we entered age group (2 = middle-aged adults, 3 = older adults) as the predictor variable. Because older adults scored lower on negative tone, negative stability connections, and negative change connections

compared with middle-aged adults, these variables were entered at the mediator level in model 1b. Since older adults scored lower on neuroticism compared with middle-aged adults, neuroticism was entered at the mediator level in model 2b. Finally, in model 3b, negative tone, negative stability connections, negative change connections, and neuroticism were entered simultaneously at the mediator level (see Table 7). Only negative change and neuroticism consistently mediated age differences in all three SWB measures; but when entering neuroticism and the life story variables simultaneously, only neuroticism significantly mediated age differences in SWB.

4. Discussion

The results also showed that both personality traits and life stories were related to SWB in predicted ways, consistent with previous studies (e.g., Adler et al., 2016; Steel et al., 2008). We confirmed previous findings of age differences in SWB, showing that older adults reported higher levels of SWB compared with young and middle-aged adults (e.g., Blanchflower & Oswald, 2008, Soto et al., 2011). In addition, older adults were lower on neuroticism compared with young and middle-aged adults. With respect to age differences in life stories, we found that, compared with young and middle-aged adults, older adults constructed more positive life stories by emphasizing positive stability connections and deemphasizing negative tone, negative stability connections, and negative change connections. These age differences in life stories and neuroticism mediated the relationship between age and SWB, with neuroticism being the strongest mediator.

4.1. Age Differences in Personality

Older adults scored significantly lower on neuroticism compared with young and middle-aged adults. Compared with young adults, older adults also scored significantly higher on agreeableness and conscientiousness. These results replicate other studies of age differences in personality traits (Soto et al., 2011). Numerous longitudinal studies have also reported changes in personality traits across the life span: Specifically, people become less neurotic and more conscientious from young adulthood to old age (see meta-analysis by Roberts, Walton, & Viechtbauer, 2006; Smits et al., 2011). Since we did not use a longitudinal design, we cannot conclude whether the age differences we found reflect age-related changes in personality traits, but the age differences in the present study are consistent with age changes in personality traits identified in longitudinal studies.

We also found age differences in life stories. Our results indicate that older adults tend to construct more positive life stories compared with young and middle-aged adults by emphasizing positive stability connections and by deemphasizing negative tone, negative stability connections, and negative change connections. These age differences were consistent with our predictions derived from the literature on the positivity effect (e.g., Reed, Chan, & Mikels, 2014) and extend this literature by showing that the age-related positivity bias also includes life stories and thus help older individuals construct a positive narrative identity in the face of age-related losses. Two previous studies on age differences in positivity of life stories have found no effect (Thomsen et al., 2017) or found that middle-aged individuals had less positive life stories than younger individuals (Thomsen et al., 2014; but see Bohn, 2010, for a study indicating that older adults have more negative life stories compared to younger adults). One explanation for the inconsistent findings is that previous studies have focused on the emotional tone of events, and

not included self-event connections and especially negative self-events connections showed large effects of age in the present study.

Our results extend McLean's (2008) study in showing that age differences in self-event connections are nuanced by the emotional tone of self-event connection. We found that older adults rated *positive* but not negative stability connections higher than the young adults. At the same time, older adults deemphasized negative change connections compared with young and middle-aged adults. Thus, while older adults may focus more on stability in their life stories, they do so in a way that emphasize stable positive aspects of the self.

4.2. Personality and SWB

Consistent with previous research (Steel et al., 2008), personality traits were associated with SWB, such that higher levels of extraversion and conscientiousness were related to higher levels of life satisfaction and positive affect, and lower levels of negative affect. Conversely, neuroticism was related to lower levels of life satisfaction and positive affect, and higher levels of negative affect.

Personality traits were also related to emotional tone and self-event connections in life stories, and these findings are generally in agreement with previous studies (e.g. Lilgendahl & McAdams, 2011; McAdams et al., 2004; McLean & Fournier, 2008; Raggatt, 2006; Thomsen et al., 2014). We found that higher levels of extraversion and conscientiousness and low levels of neuroticism were consistently related to more positive and less negative life stories. In addition, higher openness and agreeableness were related to more positive life stories, although findings were less consistent across measures.

Life stories were related to SWB as predicted. Thus, the results are consistent with previous findings (e.g. Lilgendahl & McAdams, 2011; McAdams et al., 2001; Pals, 2006), by showing that more positive life stories and more positive change connections in life stories were related to higher levels of SWB. This similarity in results occurred even when the present study used self-reporting of self-event connections, whereas previous studies have coded self-event connections based on verbal descriptions. Importantly, we extended previous findings by showing that the tone of stability connections was related to SWB, such that more positive stability connections were related to higher levels of SWB, while more negative stability connections were related to lower levels of SWB. In other words, whether we see ourselves as having changed over time *or* as being the same through time in positive or negative ways is important to our experience of well-being. Our concepts of positive and negative stability and change connections differ from the concepts of redemption and contamination (McAdams et al., 2001), since we assumed that positive and negative change or stability connections may intersect with both positive and negative events. Thus, an individual may describe positive stability and change connections in response to positive events, and not just negative events (as captured in redemption sequences). Likewise, an individual may describe negative stability and change as a part negative events, and not just positive events (as captured in contamination sequences). In fact, our results showed that positive change and stability connections were more likely to co-occur with positive events, while negative change and stability connections were more likely to co-occur with negative events (see Table 4). While redemption may be an especially powerful narrative strategy to achieve well-being (Adler et al., 2016; McAdams et al., 2001), our results suggest that positive and negative change and stability connections can fruitfully be examined more broadly.

4.3. Age Differences in Life Stories and Neuroticism Explain Age Differences in SWB

Our study suggests that age differences in life stories and neuroticism mediated age differences in SWB. Specifically, it appears that older adults' tendency to emphasize positive stability connections and to deemphasize negative tone, negative stability and negative change connections together with the age-related differences in neuroticism may mediate the age differences in SWB. Although life stories may be less stable over the life span compared with personality traits and hence more likely to explain age-related changes in SWB, we found that when the age differences in life stories and age differences in personality traits were entered in the same mediator model, in only one out of six model did life stories remain significant mediators. That is, the larger portion of age differences in SWB was explained by age differences in neuroticism. One possible explanation for this pattern of results is that as people age, their level of neuroticism decreases and this contributes to older individuals' preference for positive self-event connections and reduced emphasis on negative self-event connections leading to higher levels of SWB. However, it is also possible that personality traits influence SWB, which in turn influences interpretation of life stories. Thus, higher levels of neuroticism may be related to lower levels of SWB in younger adults, and lower levels of SWB may in turn be related to a tendency to select more negative life story chapters and specific memories and make more negative self-event connections. Indeed, experimental studies showing that mood affects the valence of autobiographical memories are consistent with this interpretation (e.g., Bower, 1981). Most likely, however, the relationship between age differences in personality traits, life stories, and SWB is reciprocal, and in order to begin to accumulate evidence of a causal relationship, longitudinal and experimental studies are

needed. Longitudinal studies could also help pinpoint when and why these age-related changes take place. Our results indicate that middle-aged participants have not yet experienced the changes in personality that support the higher levels of SWB associated with older age, but our cross sectional design does not allow any causal interpretations and we cannot rule out cohort effects. Thus, longitudinal studies need to sample a broad range of ages and include assessment of events that may catalyze the changes in personality observed in our study.

It is important to note, however, that age differences in neuroticism and life stories may not be the only mediators of age differences in SWB. A substantial body of research suggests that levels of SWB differ across adulthood due in part to age differences in adults' abilities to regulate emotions (Charles & Carstensen, 2009). Specifically, older adults have been found to be more adept at down-regulating negative emotions compared with younger adults (Mehlsen et al., 2009; Philips, Henry, Hoise, & Milne, 2008; Scheibe & Blanchard-Fields, 2009). At the same time, older adults have also been found to make more frequent use of intrapersonal emotion focused strategies, such as positive reappraisal (Folkman, Lazarus, Pimley, & Novacek, 1987). This emotion regulation strategy focus on interpretations of events and it is possible that the age differences in self-event connections found in our study is a reflection of an improved ability to interpret events in positive ways thereby down-regulating negative emotion and up-regulating positive emotions. It may even be argued that our results merely reflect that older adults are more proficient at positive re-appraisal than younger individuals. Indeed, one study found relationships between positive meaning in high- and low points in life stories and adaptive emotion regulation (Cox & McAdams, 2014). But we would argue that the self-event connections examined in our study go beyond positive re-appraisal by providing a more nuanced and detailed portrayal of the identity-salient interpretive processes involved in maintaining well-being in old age. It follows

from this that socioemotional selectivity theory could also include life stories as an outcome that is affected by the sense of limited remaining time experienced by older adults (Charles & Carstensen, 2009).

4.4. Limitations

The present study suffers from several limitations. As mentioned above, the correlational nature of the data prevents us from drawing conclusions about causal relationships. In addition, it is possible that the differences between the young, middle-aged, and older adults are not due to aging, but rather generational effects, or other unknown factors. Although individuals are arguably in the best position to report on their own SWB, more objective measures of SWB as well as peer-rating of personality traits would strengthen our results. Finally, self-rating of life stories may be limited in assessing aspects of life stories that participants are not fully aware of. In addition, self-ratings of life stories may not reflect deeper processing of events, but rather more superficial evaluations (Holm & Thomsen, 2018; McAdams, 2018; Panattoni & McLean, 2018). Hence, replicating the present findings using content coding of life stories is crucial.

5. Conclusion and perspectives

We found that older adults narrated their life stories in more positive ways and scored lower on neuroticism than both young and middle-aged adults. These age-related differences in personality mediated age differences in SWB. Our findings suggest that age-related differences in personality may explain why older adults have higher levels of SWB despite age-related losses. Future research could examine these personality changes longitudinally, also including emotion regulation and other aspects of personality that

may change with age (e.g., intrinsic motivation), disentangling how these aspects of personality interact in their prediction of age-related improvements in well-being. Knowledge of which characteristics are related to SWB may enable us to tailor interventions and recommendations towards optimizing well-being.

References

- Adler, J. M., Kissel, E. C., & McAdams, D. P. (2006). Emerging from the CAVE: Attributional style and the narrative study of identity in midlife adults. *Cognitive Therapy and Research*, 30(1), 39-51. doi:10.1007/s10608-006-9005-1
- Adler, J. M., Lodi-Smith, J., Philippe, F. L., & Houle, I. (2016). The incremental validity of narrative identity in predicting well-being: A review of the field and recommendations for the future. *Personality and Social Psychology Review*, 20(2), 142-175, doi:10.1177/1088868315585068
- Banks, M. V., & Salmon, K. (2013). Reasoning about the self in positive and negative ways: Relationship to psychological functioning in young adulthood. *Memory (Hove, England)*, 21(1), 10-17, doi:10.1080/09658211.2012.707213
- Bauer, J. J., & McAdams, D. P. (2004a). Growth goals, maturity, and well-being. *Developmental Psychology*, 40(1), 114-127. doi:10.1037/0012-1649.40.1.114
- Bauer, J. J., & McAdams, D. P. (2004b). Personal growth in adults' stories of life transitions. *Journal of Personality*, 72(3), 573-602. doi:10.1111/j.0022-3506.2004.00273.x
- Bech, P., (2012). Clinical psychometrics. Oxford: Wiley Blackwell. doi:10.1002/9781118511800
- Bilberg, R., Nørgaard, B., Roessler, K.K., & Overgaard, S. (2014): Mental health as a predictor for patient reported outcome after total hiparthroplasty – a prospective cohort study. *Orthopedics & Muscular System*. (7) doi:10.4172/2161-0533.S2-004

- Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, 66(8), 1733-1749. doi:10.1016/j.socscimed.2008.01.030
- Bohn, A. (2010). Generational differences in cultural life scripts and life story memories of younger and older adults. *Applied Cognitive Psychology*, 24(9), 1324-1345, doi:10.1002/acp.1641
- Bower, G. H. (1981). Mood and memory. *American Psychologist*, 36(2), 129-148. doi:10.1037/0003-066X.36.2.129
- Charles, S. T., & Carstensen, L. L. (2009). Social and emotional aging. *Annual Review of Psychology*, 61(1), 383-409. doi:10.1146/annurev.psych.093008.100448
- Charles, S. T., Mather, M., & Carstensen, L. L. (2003). Aging and emotional memory : The forgettable nature of negative images for older adults. *Journal of Experimental Psychology: General*, 132(2), 310-324. doi:10.1037/0096-3445.132.2.310
- Christensen, K. S., Fink, P., Toft, T., Frostholm, L., Ornbøl, E., & Olesen, F. (2005). A brief case-finding questionnaire for common mental disorders: The CMDQ. *Family Practice*, 22(4), 448-457. doi:10.1093/fampra/cmi025
- Costa, P. T., McCrae, R. R., Skovdahl Hansen, H., Lykke Mortensen, E., & Schiøtz, H. K. (2004). *NEO PI-R: Manual - klinisk*. Virum: Dansk Psykologisk Forlag.
- Cox, K., & McAdams, D. P. (2014). Meaning making during high and low point life story episodes predicts emotion regulation two years later: How the past informs the future. *Journal of Research in Personality*, 50, 66-70. doi:10.1016/j.jrp.2014.03.004

- Diener, E., & Suh, E. M. (1998). Subjective well-being and age. An international analysis. *Annual Review of Gerontology and Geriatrics*, 17, 304-324. doi:10.1007/978-94-007-0753-5_2905
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71-75. doi:10.1207/s15327752jpa4901_13
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276-302. doi:10.1037/0033-2909.125.2.276
- Fivush, R. (2007). Maternal reminiscing style and children's developing understanding of self and emotion. *Clinical Social Work Journal*, 35(1), 37-46. doi:10.1007/s10615-006-0065-1
- Folkman, S., Lazarus, R. S., Pimley, S., & Novacek, J. (1987). Age differences in stress and coping processes. *Psychology and Aging*, 2(2), 171-184. doi:10.1037/0882-7974.2.2.171
- Frijters, P. & Beatton, T. (2012). The mystery of the U-shaped relationship between happiness and age. *Journal of Economic Behavior & Organization*, 82(2/3), 525. doi:10.1016/j.jebo.2012.03.008
- Habermas, T., & Bluck, S. (2000). Getting a life: The emergence of the life story in adolescence. *Psychological Bulletin*, 126(5), 748-769. doi:10.1037/0033-2909.126.5.748
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis : A regression-based approach, second edition*. New York: The Guilford Press.

Holm, T., & Thomsen, D. K. (2018). Self-event connections in life stories, self-concept clarity, and dissociation: Examining their relations with symptoms of psychopathology.

Imagination, Cognition and Personality, 37(3), 293-317.

King, L. A., Scollon, C. K., Ramsey, C., & Williams, T. (2000). Stories of life transition:

Subjective well-being and ego development in parents of children with down syndrome.

Journal of Research in Personality, 34(4), 509-536.

doi:<http://dx.doi.org.ez.statsbiblioteket.dk/2048/10.1006/jrpe.2000.2285>

Lilgendahl, J. P., & McAdams, D. P. (2011). Constructing stories of self-growth: How individual differences in patterns of autobiographical reasoning relate to well-being in midlife. *Journal of Personality*, 79(2), 391-428. doi:10.1111/j.1467-6494.2010.00688.x

Lind, M., Jørgensen, C. R., Heinskou, T., Simonsen, S., Bøye, R., & Thomsen, D. K. (2018).

Patients with borderline personality disorder show increased agency in life stories after 12 months of psychotherapy. *Psychotherapy (Chicago, Ill.)*, doi:10.1037/pst0000184

McAdams, D. P. (1993). *The stories we live by: Personal myths and the making of the self*. New York: Guilford Press.

McAdams, D. P. (1996). Personality, modernity, and the storied self: A contemporary framework for studying persons. *Psychological Inquiry*, 7(4), 295-321.

doi:10.1207/s15327965pli0704_1

McAdams, D. P. (2001). The psychology of life stories. *Review of General Psychology*, 5(2), 100-122. doi:10.1037/1089-2680.5.2.100

McAdams, D. P. (2018). Narrative identity: What is it? What does it do? How do you measure it? *Imagination, Cognition and Personality*, 37(3), 359-372.

doi:10.1177/0276236618756704

McAdams, D. P., Anyidoho, N. A., Brown, C., Huang, Y. T., Kaplan, B., & Machado, M. A. (2004). Traits and stories: Links between dispositional and narrative features of personality.

Journal of Personality, 72(4), 761-784. doi:10.1111/j.0022-3506.2004.00279.x

McAdams, D.P., Bauer, J.J., Sakaeda, A.R., Anyidoho, N.A., Machado, M.A., Magrino-Failla, K., White, K.W. & Pals, J.L. (2006). Continuity and change in the life story: a longitudinal study of autobiographical memories in emerging adulthood. *Journal of Personality*, 74, 1371-1400. doi: 10.1111/j.1467-6494.2006.00412.x

McAdams, D. P., Reynolds, J., Lewis, M., Patten, A. H., & Bowman, P. J. (2001). When bad things turn good and good things turn bad: Sequences of redemption and contamination in life narrative and their relation to psychosocial adaptation in midlife adults and in students. *Personality and Social Psychology Bulletin*, 27(4), 474-485.

doi:10.1177/0146167201274008

McLean, K. C. (2008). Stories of the young and the old: Personal continuity and narrative identity. *Developmental Psychology*, 44(1), 254-264. doi:10.1037/0012-1649.44.1.254

Mehlsen, M., Kirkegaard Thomsen, D., Viidik, A., Olesen, F., & Zachariae, R. (2005). Cognitive processes involved in the evaluation of life satisfaction: Implications for well-being. *Aging & Mental Health*, 9(3), 281-297. doi:10.1016/S0191-8869(02)00120-4

- Mehlsen, M., Jensen, A. B., Christensen, S., Pedersen, C. G., Lasseisen, B., & Zachariae, R. (2009). A prospective study of age differences in consequences of emotional control in women referred to clinical mammography. *Psychology and Aging*, 24(2), 363-372. doi:10.1037/a0015188
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology*, 75(5), 1333-1349. doi:10.1037/0022-3514.75.5.1333
- Pals, J. L. (2006). Authoring a second chance in life: Emotion and transformational processing within narrative identity. *Research in Human Development*, 3(2), 101-120. doi:10.1080/15427609.2006.9683364
- Panattoni, K., & McLean, K. C. (2018). The curious case of the coding and self-ratings mismatches: A methodological and theoretical detective story. *Imagination, Cognition and Personality*, 37(3), 248-270.
- Pasupathi, M., Billitteri, J., Mansfield, C.D., Wainryb, C., Hanley, G.E., & Taheri, K. (2015). Regulating emotion and identity by narrating harm. *Journal of Research in Personality*, 58, 127-136. Doi:10.1016/j.jrp.2015.07.003
- Pasupathi, M., Mansour, E., & Brubaker, J. R. (2007). Developing a life story: Constructing relations between self and experience in autobiographical narratives. *Human Development*, 50(2-3), 85-110. doi:10.1159/000100939

- Pedersen, A. M., Nielsen Straarup, K., & Thomsen, D. K. (2018). Narrative identity in female patients with remitted bipolar disorder: A negative past and a foreshortened future. *Memory*, 26(2), 219-228. doi:10.1080/09658211.2017.1344250
- Phillips, L. H., Henry, J. D., Hosie, J. A., & Milne, A. B. (2008). Adult aging and the experience, expression and regulation of negative affect. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 63, 138–145. doi: 10.1177/0963721410388395
- Raggatt, P. (2006). Putting the fivefactor model into context: Evidence linking big five traits to narrative identity. *Journal of Personality*, 74(5), 1321-1348. doi:10.1111/j.1467-6494.2006.00411.x
- Reed, A. E., Chan, L., & Mikels, J. A. (2014). Meta-analysis of the age-related positivity effect: Age differences in preferences for positive over negative information. *Psychology and Aging*, 29(1), 1-15. doi:10.1037/a0035194
- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course : A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1-25. doi:10.1037/0033-2909.132.1.1
- Scheibe, S., & Blanchard-Fields, F. (2009). Effects of regulating emotions on cognitive performance : What is costly for young adults is not so costly for older adults. *Psychology and Aging*, 24(1), 217-223. doi:10.1037/a0013807

- Smits, I. A., Dolan, C. V., Vorst, H., Wicherts, J. M., & Timmerman, M. E. (2011). Cohort differences in Big Five personality factors over a period of 25 years. *Journal of personality and social psychology*, 100(6), 1124-38. doi:10.1037/a0022874
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of personality and social psychology*, 100(2), 330-348. doi:10.1037/a0021717
- Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, 134(1), 138-161. doi:10.1037/0033-2909.134.1.138
- Steiner, K. L., Thomsen, D. K., & Pillemer, D. B. (2017). Life story chapters, specific memories, and conceptions of the self. *Applied Cognitive Psychology*, 31(5), 478-487. doi:10.1002/acp.3343
- Thomsen, D. K. (2009). There is more to life stories than memories. *Memory*, 17(4), 445-457. doi:10.1080/09658210902740878
- Thomsen, D.K. (2015). Autobiographical periods: A review and central components of a theory. *Review of General Psychology*, 19(3), 294-310. doi:10.1037/gpr0000043
- Thomsen, D. K., & Berntsen, D. (2008). The cultural life script and life story chapters contribute to the reminiscence bump. *Memory*, 16(4), 420-435. doi:10.1080/09658210802010497

Thomsen, D. K., Lind, M., & Pillemer, D. B. (2017). Examining relations between aging, life story chapters, and well-being. *Applied Cognitive Psychology*, 31(2), 207-215.

doi:10.1017/CBO9780511558313.009

Thomsen, D. K., Olesen, M. H., Schnieber, A., & Tønnesvang, J. (2014). The emotional content of life stories: Positivity bias and relation to personality. *Cognition & Emotion*, 28(2), 260-

277. doi:10.1080/02699931.2013.815155

Table 1

Questions for chapters and specific memories

Variable Labels	Questions
Positive tone	To what extent would you describe the chapter/specific memory as positive
Negative tone	To what extent would you describe the chapter/specific memory as negative
Positive stability	Does the chapter/specific memory highlight any positive attributes that characterize who you are?
Negative stability	Does the chapter/specific memory highlight any negative attributes that characterize who you are?
Positive change	Has the chapter/specific memory changed you in a positive way?
Negative change	Has the chapter/specific memory changed you in a negative way?

Note. The questions were rated from 1 (not at all) to 5 (very much).

Table 2

Demographic Variables as a Function of Age Group

	Young adults (<i>N</i> = 101)	Middle-aged adults (<i>N</i> = 77)	Older adults (<i>N</i> = 81)	Total sample (<i>N</i> = 259)
Age, <i>M</i> (<i>SD</i>)	22.71 (1.61)	47.56 (2.24)	67.04 (1.95)	43.96 (18.75)
Gender (women)	49 (48.5%)	60 (77.9%)	45 (55.6%)	154 (59.5%)
Highest education				
Primary school	0	2 (2.6%)	2 (2.5%)	4 (1.5%)
High school	64 (63.4%)	2 (2.6%)	0	66 (25.5%)
Vocational education	3 (3.0%)	10 (13.0%)	12 (14.8%)	25 (9.7%)
Academy profession degree	2 (2.0%)	4 (5.2%)	11 (13.6%)	17 (6.6%)
Bachelor's degree	26 (25.7%)	36 (46.8%)	34 (42.0%)	96 (37.1%)
Master's degree	4 (4.0%)	21 (27.3%)	19 (23.5%)	44 (17.0%)
Other	2 (2.0%)	2 (2.6%)	3 (3.7%)	7 (2.7%)

Table 3

Gender Differences in Subjective Well-Being, Life Stories, and Personality

Traits

	<u>Women</u>		<u>Men</u>		<i>t</i> (257)	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Life satisfaction	24.99	7.04	25.79	6.47	-.93	.35	.12
Well-being	16.10	4.91	16.20	4.93	-.16	.87	.02
Negative affect	6.94	6.32	6.80	7.19	.16	.87	.02
Positive tone	3.56	.55	3.65	.60	-1.20	.23	.15
Negative tone	2.63	.54	2.48	.59	2.19	.03	.27
Positive stability	3.54	.60	3.62	.55	-1.04	.30	.13
Negative stability	2.29	.58	2.23	.59	.83	.41	.10
Positive change	3.52	.62	3.60	.57	-1.02	.31	.13
Negative change	1.91	.53	1.85	.49	.91	.36	.11
Neuroticism	33.36	9.01	31.08	8.71	2.02	.04	.25
Extraversion	42.47	7.56	42.37	6.97	.10	.92	.01
Openness	42.77	6.41	41.13	6.94	1.95	.05	.24
Agreeableness	44.92	5.11	42.21	5.26	4.15	.00	.52
Conscientiousness	45.05	6.61	44.05	7.80	1.11	.27	.14

Note. CI = confidence interval

Table 4

Means, Standard Deviations (SD) and Omnibus Tests for Subjective Well-Being, Life Stories, and Personality Traits

	<u>Young adults</u>		<u>Middle-aged adults</u>		<u>Older adults</u>		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> (2, 256)
Life Satisfaction	24.85	6.07	23.61	7.24	27.51	6.77	7.16**
Well-Being	15.25	4.19	15.24	5.45	18.10	4.69	10.06***
Negative Affect	8.13	6.44	7.64	7.00	4.61	6.13	7.31**
Positive tone	3.64	.56	3.50	.59	3.63	.56	1.50
Negative tone	2.52	.53	2.73	.61	2.49	.54	4.43*
Positive stability	3.46	.60	3.61	.54	3.68	.58	3.33*
Negative stability	2.27	.53	2.40	.60	2.12	.60	4.66*
Positive change	3.59	.61	3.53	.58	3.52	.60	.69
Negative change	1.95	.47	2.01	.54	1.68	.48	10.40***
Neuroticism	34.46	8.56	33.49	9.21	28.93	8.20	10.00***
Extraversion	42.58	7.15	41.47	7.59	43.15	7.24	1.08
Openness	41.52	7.21	43.09	6.43	41.91	6.13	1.27
Agreeableness	43.16	6.67	45.31	5.64	46.25	5.53	6.35**

Conscientiousness	43.48	7.74	44.61	6.38	46.12	6.77	3.16*
-------------------	-------	------	-------	------	-------	------	-------

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Intercorrelations Among Main Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Life Satisfaction	-	.67**	-.65**	.37**	-.32**	.32**	-.29**	.28**	-.36**	-.54**	.38**	.06	.10	.34**
2. Well-Being		-	-.70**	.34**	-.30**	.31**	-.34**	.35**	-.42**	-.60**	.42**	.11	.14*	.44**
3. Negative Affect			-	-.28**	.32**	-.24**	.38**	-.24**	.45**	.71**	-.33**	.01	-.10	-.36**
4. Positive tone				-	-.77**	.50**	-.38**	.37**	-.32**	-.29**	.29**	.02	.02	.22**
5. Negative tone					-	-.30**	.56**	-.19**	.48**	.32**	-.18**	.14*	-.03	-.23**
6. Positive stability						-	-.19**	.64**	-.24**	-.31**	.41**	.25**	.14*	.32**
7. Negative stability							-	-.21**	.69**	.45**	-.22**	.05	-.25**	-.31**
8. Positive change								-	-.20**	-.27**	.37**	.21**	.06	.34**
9. Negative change									-	.47**	-.28**	.00	-.24**	-.30**

10. Neuroticism	-	-.49**	-.06	-.11	-.45**
11. Extraversion		-	.33**	.04	.25**
12. Openness			-	.20*	.04
13. Agreeableness				-	.16*
14. Conscientiousness					-

* $p < .05$, ** $p < .001$

Table 6

Age Differences in Life Stories and Personality Traits Mediate Age Differences in SWB: Comparing Young and Older Adults

	<u>Life Satisfaction</u>		<u>Well-Being</u>		<u>Negative Affect</u>	
	Partially standardized		Partially standardized		Partially standardized	
	indirect effect	95% CI	indirect effect	95% CI	indirect effect	95% CI
Mediation Model 1a						
Positive stability	.05*	[.01, .09]	.04*	[.004, .08]	-.03*	[-.07, -.001]
Negative change	.07*	[.03, .13]	.07*	[.03, .13]	-.09*	[-.15, -.04]
Mediation Model 2a						
Neuroticism	.15*	[.08, .23]	.13*	[.07, .21]	-.20*	[-.29, -.12]
Conscientiousness	.02	[-.01, .05]	.04*	[.003, .09]	-.02	[-.05, .01]
Mediation Model 3a						
Positive stability	.03*	[.001, .07]	.02	[-.01, .05]	-.01	[-.03, .02]
Negative change	.02	[-.01, .06]	.02	[-.02, .05]	-.01	[-.05, .02]
Neuroticism	.13*	[.07, .20]	.12*	[.06, .20]	-.19*	[-.29, -.11]
Conscientiousness	.01	[-.02, .04]	.04	[.001, .08]	-.01	[-.05, .01]

Note. CI = confidence interval

* = $p < .05$

Table 7

Age Differences in Life Stories and Personality Traits Mediate Age Differences in SWB: Comparing Middle-Aged and Older Adults

	<u>Life Satisfaction</u>		<u>Well-Being</u>		<u>Negative Affect</u>	
	Partially standardized		Partially standardized		Partially standardized	
	indirect effect	95 % CI	indirect effect	95% CI	indirect effect	95% CI
Mediation Model 1b						
Negative tone	.08*	[.003, .20]	.03	[-.05, .11]	-.04	[-.12, .02]
Negative stability	-.004	[-.11, .11]	.01	[-.12, .12]	-.03	[-.13, .07]
Negative change	.16*	[.02, .33]	.25*	[.08, .46]	-.23*	[-.43, -.06]
Mediation Model 2b						
Neuroticism	.27*	[.11, .44]	.31*	[.12, .49]	-.35*	[-.56, -.14]
Mediation Model 3b						
Negative tone	.07	[-.001, .19]	.01	[-.06, .10]	-.03	[-.10, .02]
Negative stability	-.05	[-.16, .04]	-.05	[-.20, .06]	.03	[-.04, .15]
Negative change	.06	[-.07, .21]	.13	[-.02, .30]	-.10	[-.27, .03]
Neuroticism	.24*	[.09, .41]	.28*	[.11, .46]	-.32*	[-.52, -.13]

Note. CI = confidence interval

* $p < .05$