The emotional content of life stories:

Positivity bias and relation to personality

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Abstract

We examined whether past and future negative life story events, compared to past
and future positive events, were less likely to be related to life story chapters and
situated at a greater temporal distance from the present. We also examined relations
between life stories and personality traits. 310 students and 160 middle-aged adults
completed a measure of personality traits and identified chapters as well as past and
future events in their life story. All life story components were rated on emotion and
age. Negative future events were less likely to be a continuation of chapters and were
more temporally distant than positive future events. Extraversion and
Conscientiousness were related to more positive life stories, and Neuroticism was
related to more negative life stories. This suggests that the life story is positively
biased by minimizing the negative future, and that the construction of life stories is
related to personality traits.

KEYWORDS: LIFE STORY; EMOTION; PERSONALITY; CHAPTERS;
MENTAL TIME TRAVEL

The emotional content of life stories: Positivity bias and relation to personality

Life stories are a part of our identity and influence the actions we consider possible and the outcomes we expect (McAdams, 2001; Pillemer, 2001; White & Epston, 1990). The life story underlies our sense of continuation between past, present, and future: Through the life story we reflect on how we have come to be who we are and how we will develop in the future. These connections between past, present and future communicate a sense of meaning in life – things do not happen at random (McAdams, 2001). But the meaning contained in life stories may be very different. Some life stories are positive and convey a sense of hope and growth, even in the face of negative events. Other stories are negative and convey a dark picture of loss and downward spiraling (Gergen & Gergen, 1988; McAdams, 2006). The stories we tell are not just for entertainment: The way we narrate our experiences is related to well-being (Adler, 2012; King, Scollon, Ramsey, & Williams, 2000; Pals, 2006). Also our stories do not just reflect the raw data of experience: The meaning in life stories is continually constructed by emphasizing some parts of autobiographical memory (while ignoring others) and by selectively interpreting the causes and consequences of events (Bluck & Habermas, 2000; Conway, Singer, & Tagini, 2004; McAdams, 2001; Pillemer, 2001).

Autobiographical memory is positively biased (e.g., Walker, Skowronski, & Thompson, 2003; Wilson & Ross, 2003), and since life stories are based on autobiographical memory, they may also focus on positive events and interpretations.

This could serve as means to a positive view of the self and the future, which preserves motivation even when obstacles are encountered (e.g., Taylor & Brown, 1988). Thus, one question is whether life stories are positively biased.

Another question is whether variation in emotional content is related to personality traits. Personality may influence selection and interpretation of events and hence the emotional content of life stories (McAdams, 1996). This means that some individuals may be vulnerable to constructing negative life stories, resulting in a negative view of themselves and the future.

Most life story and autobiographical memory research focuses on specific memories, i.e., events located to a single day in the individual's life. Thus, specific memories have been argued to be the "building blocks of life narratives" (Bluck, 2001, p. 68). However, autobiographical memory is not limited to specific memories (Brewer, 1986; Conway, 2005). Of special interest here, is that autobiographical memory also encompasses knowledge of extended time periods, known as lifetime periods. Lifetime periods can span several years and include information about people, places, and activities typically associated with the period as well as the general emotional content (Conway, 2005). Such extended autobiographical memory may function as chapters in the life story, providing the life story with an overall temporal and thematic coherence (McAdams, 2001; Thomsen, 2009). Thus, the way individuals organize chapters is central to the meaning of the life story. The study reported here focuses on chapters in illuminating the emotional content of life stories.

We first examined differences in how positive and negative events in the past and future are related to the overall chapter structure in life stories. Second, we examined whether positive and negative events differ in their temporal distance from the present. Third, we tested whether the emotional content of life stories was related to the Big Five personality traits. Below we first describe the relationship between chapters and events in the past and future. We then describe the possible connections between these life story components and personality.

Chapters in relation to emotional past and future events

Although research on chapters is sparse, the idea of extended autobiographical memory is not new (Barsalou, 1988; Brown, 1990; Conway & Rubin, 1993; Linton, 1986; Robinson, 1992). Life story chapters have been argued to be a part of a hierarchical organization of autobiographical memory with the life story at the top level (Bluck & Habermas, 2000; Conway et al., 2004). In this organization, extended chapters nest briefer chapters which nest specific and general memories (Barsalou, 1988; Burt, Kemp, & Conway, 2003; Conway, 2005; Neisser, 1986). In the present article, we term autobiographical memories "past events" for ease of communication when comparing to their future counterpart, which we term "future events".

Life story chapters show an increased frequency in young adulthood, meaning that more chapters begin around 15-30 years of age (Thomsen & Berntsen, 2008; Thomsen, Pillemer, & Ivcevic, 2011). This is especially the case for positive chapters, whereas negative chapters show a more even distribution (Thomsen et al., 2011). When individuals identify past life story events they are more likely to select

events from the beginning of chapters (Thomsen & Berntsen, 2008; Thomsen, Olesen, Schnieber, Jensen, & Tønnesvang, 2012), and this seems to be the case for both positive and negative past events (Thomsen et al., 2011). The increased recall from the beginning of chapters may occur, because these events contain important information about role- and self-changes (e.g., Pillemer, Rhinehart, & White, 1986; Rathbone, Moulin, & Conway, 2008; Thomsen et al., 2011). Such past events may be more likely to become self-defining memories included in the life story (Singer, 2004).

However, not all life story events may be a part of chapters. Either because the event is not thematically related to a life story chapter (i.e. it is perceived as an isolated instance), or because the event is a part of an extended period not considered a life story chapter (i.e. it is a part of a period considered mundane, e.g. "when I was a girl scout"). No previous studies have examined whether positive and negative past events are equally likely to be perceived as a part of chapters.

The life story is also directed towards the future and may contain possible positive and negative future events. Such events may symbolize future positive and negative selves and direct behavior aimed at achieving the positive events and avoiding the negative events (McAdams, 1993). It has been suggested that the construction of future events is based on memory (e.g. Atance & O'Neill, 2001; Schachter, Addis, & Buckner, 2007; Szpunar, 2010; Suddendorf & Corballis, 2007). Supporting this, both past and future events are most frequent in the near past and future and then become less frequent with increased distance from the present, although the drop-off for future events is steeper (e.g. Berntsen & Jacobsen, 2008;

Spreng & Levine, 2006). Both past and future events are positively biased, but future

events more so (e.g., Berntsen & Bohn, 2010; Berntsen & Jacobsen, 2008;

D'Argembeau & van der Linden, 2004; D'Argembeau, Xue, Lu, van der Linden, &

Bechara, 2008; Newby-Clark & Ross, 2003; Rasmussen & Berntsen, 2013).

Recently it has been suggested that the construction of future events is

influenced by chapters (D'Argembeau, Lardi, & van der Linden, 2012;

D'Argembeau & Mathy, 2012). As chapters are central in providing the life story

with overall coherence, future events are probably constructed as thematically

consistent extensions of chapters, thus providing continuity between past and future.

Note that future events may be constructed to be thematically consistent extensions

of both ongoing and past chapters (see example in Appendix). However, no previous

studies have examined whether future events in the life story are perceived as a

continuation of chapters and whether this differs between positive and negative

future events.

Based on these ideas, we examined whether positive and negative events

in the past and future relate to chapters in different ways. We expected that past

negative events would less often be a part of chapters than past positive events.

Similarly, we expected that future negative events would less often be a continuation

of chapters than future positive events. The rationale for these ideas is that the overall

life story as represented by chapters is presumably positive, being a part of the

positive self-concept most people hold (e.g., Sedikides & Gregg, 2008; Taylor &

Brown, 1988). Although individuals may be able to identify negative past and future

events, such events may be perceived as exceptions and not as a part of the overall

chapter structure or the thematically consistent future extension of such chapters. In support of this idea, studies have found that positive past events are rated as more central to identity and life story than negative past events (Rasmussen & Berntsen, 2009; Berntsen, Rubin, & Siegler, 2011). However, when past and future negative events are perceived as a part or a continuation of chapters, individuals may distance themselves from these negative events in other ways. One possibility is to identify negative events in ways that maintain psychological distance, for example by identifying past and future negative events as temporally more distant. Extensive research has shown that individuals subjectively experience negative events as temporally more distant than positive events, possibly as a way to distance present selves from past negative selves (Wilson & Ross, 2003). Thus, we expected past and future negative events to be related to temporally more distant chapters and to be more temporally distant than past and future positive events. Finally, based on previous studies, we also expected both positive and negative past events to be over-represented at the beginning of chapters.

The emotional content of life stories and personality

Personality may impact on how events are (re)constructed and how chapters are formed, both of which shape self-understanding. If positive events and chapters are emphasized in the life story, this forms the basis for positive self-understanding and positive expectations for the future. If, on the other hand, negative events and chapters are magnified, the individual may develop a negative self-understanding and a pessimistic outlook on the future. This interplay between personality and life story is articulated in McAdams' (1996) model of personality. In

this model, personality consists of three separate, but related, layers: 1) stable inborn dispositions, like personality traits, 2) context-dependent expressions of personality, like self-images and goals, and 3) life stories that tie together the different self-images and goals across context and time, and that is constructed in the interplay between autobiographical memory, other parts of personality and social-cultural processes.

Here we focus on the big five, i.e., Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness, because it is a well-established taxonomy of personality traits (John, Nauman, & Soto, 2008; McCrae & Costa, 2008). Also, Neuroticism and Extraversion have been shown to be closely related to positive and negative emotional states (Steel, Schmidt, & Schulz, 2008) and thus may be expected to show relations with the emotional content of life stories. These relations have been confirmed in three separate studies. In two data-collections, using 10 specific life story memories as measures of the life story, Neuroticism was associated with negative emotional content, but, surprisingly, Extraversion was not associated with more positive emotional content (McAdams et al., 2004). In a later study, measuring the life story partly through specific life story memories, Extraversion was associated with identifying positive emotions as a theme, and Neuroticism was associated with identifying negative emotions as a theme (Raggatt, 2006). A third study examining self-event connection in self-defining memories, found that Extraversion and Openness were related to making more positive self-event connections, i.e., connections where an event was seen as having a positive impact on the self.

Neuroticism was not related to the positivity of self-event connections (McLean & Fournier, 2008).

The above studies all examine the life story as measured through past events. To the best of our knowledge, the relationship between chapters and personality has not been examined. Thus, we tested whether Neuroticism was related to more negative content, and whether Extraversion was related to more positive content in chapters. We also related Neuroticism and Extraversion to positive and negative events in the past and the future.

The present studies

In summary, the two purposes of the present studies were to examine 1) whether positive and negative past and future events differ in how they relate to chapters and their temporal distance from the present, and 2) whether the emotional content of life stories was related to personality traits. With regard to the first purpose, we hypothesized that negative past and future events would be 1) less likely to be a part or a continuation of chapters and 2) more temporally distant and related to temporally more distant chapters compared to positive past and future events. Referring to the second purpose we hypothesized that 1) Neuroticism would be related to more negative content in chapters, past events and future events, and 2) that Extraversion would be related to more positive content in chapters, past events and future events. We included both a young and a middle-aged sample to examine whether these hypotheses could be confirmed across age.

Method

Participants

Young sample. The participants were 310 students, 221 women and 89 men with a mean age of 22.95 (range 19-64, $SD = 5.04$), who had previously participated in a study on personality (see Olesen, Thomsen, Schnieber, & Tønnesvang, 2010; Thomsen, Schnieber, & Olesen, 2011; Thomsen, Tønnesvang, Schnieber, & Olesen, 2011). The young sample participated in the present study as a part of a follow-up on the original study (the follow-up data have not previously been reported).

Middle-aged sample. The participants were 161 adults (128 women, 32 men, one missing) with a mean age of 50.01 (range 20-78, $SD = 12.01$). Regarding marital status, 24 indicated never married/single, 112 indicated married or co-habiting, 18 indicated divorced, 3 indicated widowed, and 1 indicated other status (3 missing values). Regarding work status, 93 worked full-time, 26 worked part-time, 8 were unemployed, 24 were retired, 6 were studying, and 1 was a house wife (3 missing values). Highest achieved education was as follows: 8 had primary school, 14 had practical education, 10 had high school education (or equivalent), 91 had college education (3-4 years of post-high school education), and 37 had university education (5 years post high school, resulting in both a bachelor's and a master's degree) (1 missing value). The participants were recruited through evening lectures in psychology.

Materials

For the young sample, we used electronic questionnaires to measure personality traits and the life story. For the middle-aged sample, we used paper and pencil versions of the same questionnaires. There were some minor differences in material between the two samples, this is noted below.

The NEO-FFI (Costa & McCrae, 2004) was used to measure the big five personality traits. The Danish translation of the NEO-FFI consists of 60 items measuring Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness with 12 items each. The items are answered on 5-point scales, and higher scores indicate higher degree of the trait. The internal reliabilities for the subscales in the present study were good (Cronbach's alphas: 0.86 (Neuroticism), 0.82 (Extraversion), 0.70 (Openness), 0.76 (Agreeableness), and 0.84 (Conscientiousness)).

The participants were asked to identify chapters in their life story by the following instruction: "Please think about your life story and divide it into chapters. It is important that the chapters cover your whole life story – think back over your entire life. For each of your chapters, please briefly describe the main content in a few key sentences. Chapters need not have a clear beginning or end. You can include parallel chapters, i.e., chapters may refer to the same period in your life story. You may also include chapters that are not yet finished. *Some people describe their life story in just a few chapters, whereas other people describe their life story in many chapters. There is no right or wrong way to divide your life into chapters—it is up to you to decide how many chapters to include.* Please begin with chapter 1 and end

whenever you are satisfied with your description of the chapters in your life. You can describe up to 20 chapters" (based on McAdams, 1993; Thomsen & Berntsen, 2008). The middle-aged sample was instructed that they could continue their description on the back page of the questionnaire if they had more than 20 chapters (because very few participants did so, analyses are based on only the 20 chapters indicated in the questionnaire). Note that although the chapter instruction may seem to invite chronological ordering of chapters, participants are allowed to and sometimes do report chapters non-chronologically (as evidenced by a correlation between order and chapter start age of r_s (3767) = 0.84, $p < 0.05$).

The participants were then provided with 20 text fields where they could describe the content of the chapter. In addition, they were asked to give their age at the start of the chapter, their age at the end of the chapter or, if the chapter was ongoing, to mark "ongoing". For each chapter, they were asked to describe the emotional content on a 7-point scale, with 1 indicating "extremely negative", 4 indicating "mixed, equally positive and negative", and 7 indicating "extremely positive".

The participants were then asked to identify positive and negative past and future events in their life story (based on McAdams, 1993; see Appendix 1 for detailed instructions). They were given a text field to describe the event and were asked to give their age at the time of the event. For the past events, they were asked to rate the emotional content of the positive event on a 3-point scale with 1 indicating "moderately positive", 2 indicating "very positive", and 3 indicating "extremely positive" (for the negative event, the word "negative" replaced "positive" on the

rating scale). For the future events, they were asked to rate the emotional content of

the event on a 7-point scale with 1 indicating "extremely negative", 4 indicating

"mixed, equally positive and negative", and 7 indicating "extremely positive".

Lastly, they were asked to look back upon the chapters they had identified and decide

whether the event was "a part of" (past events) or "a direct continuation of" (future

events) one of these chapters with the response options yes (= 1) and no (= 0). If they

responded yes, they were asked to indicate what chapter the event was a part of and,

if it was a part of several chapters, they were asked to select the most important (see

Appendix 2 for an example).

The middle-aged sample was asked to describe and rate the four events in

counterbalanced order to ensure that the results were not due to the order of

presentation.

Procedure

Young sample. The participants received links to several electronic

questionnaires by email. The NEO-FFI was part of one questionnaire, and the life

story questions were part of another questionnaire. Each questionnaire had to be

completed within one hour. Participants who completed all electronic questionnaires

received a book gift (value $29).

Middle-aged sample. The participants received the questionnaires to be

completed at home along with a pre-stamped envelope. They received a book gift

(value $25) for their inconvenience.

Results

The means for the variables are displayed in Table 1. The middle-aged sample had significantly more and longer chapters than the young sample. The young sample had significantly more positive life story chapters than the middle-aged sample.

In order to examine the temporal distribution of chapters, we plotted percentage of chapter beginnings across age. As can be seen from Figure 1, there was a sharp increase in chapters during the teenage years, i.e., the age interval between 16-20 years for both samples. We also examined the emotional content of chapters across the life span. Thus, we plotted the mean emotional content of chapters starting in a given age interval (see Figure 2). For both samples, chapters starting during young childhood and adolescence/young adulthood were rated as more positive than chapters starting during late childhood. For the middle-aged sample, young adulthood was also rated more positive than later adult years.

Below, we first report analyses on the relations between chapters and past events. Second, we report results concerning chapters and future events. Third, we describe results concerning the temporal distance from the present for all four types of events. Finally, we report analyses on the associations between the emotional content of life stories and personality traits.

Chapters and past events

As the middle-aged sample was asked to describe positive and negative events in their past and future in counterbalanced order, we first tested whether participants differed in their likelihood of describing positive and negative past

events. McNemar tests for correlated proportions showed that participants were equally likely to report positive and negative past events (no report of positive events: 6% and no report of negative events: 6%; $\chi^2(1, N = 161) = 125.33$, $p > 0.05$).

Next, we examined whether past negative events were less likely than past positive events to be a part of chapters. Almost all past events were perceived to be a part of chapters (young/middle-aged sample: positive events = 88%/90% and negative events = 83%/91%). McNemar tests for correlated proportions showed that the difference between positive and negative events did not quite reach conventional levels of significance for the young sample ($\chi^2(1, N = 310) = 10.91$, $p = 0.06$) and was non-significant for the middle-aged sample ($\chi^2(1, N = 146) = 13.72$, $p > 0.05$).

We then compared chapter characteristics for positive and negative past events (Tables 2 and 3). For the young sample, past negative events were a part of chapters that started and ended earlier in life than past positive events. Past negative events were also less likely to be a part of ongoing chapters. Neither of these findings replicated for the middle-aged sample. For both samples, past negative events were a part of more negative chapters than past positive events.

In order to examine whether positive and negative past events were more frequent around the beginning of the chapter they were a part of, we subtracted the age at the start of the chapter from the age at the past event. A "0" would indicate that the event is dated to the start year of the chapter. The results are plotted in Figure 3 (note that we only display results for chapters longer than one year, because including chapters lasting less than one year would only allow events to occur in the start year of the chapter, thus introducing an artificially inflated beginning effect).

For the young sample, neither positive nor negative past events were over-represented at the beginning of the chapter. However, the middle-aged sample showed the expected increase of events at the chapter beginning for both positive and negative events.

Chapters and future events

As the participants in the middle-aged sample were asked to describe positive and negative events in their past and future in counterbalanced order, we first tested whether the participants differed in their likelihood of describing positive and negative future events. Participants were significantly less likely to report negative future events compared to positive future events (percentage that did not report positive event: 15% versus negative event: 26%; $\chi^2(1, N =161) = 24.09$, $p < 0.05$).

Future negative events were less likely to be a continuation of chapters than future positive events. This was the case for both the young and the middle-aged sample (young sample: positive events = 67% continuation of chapters versus negative events = 38%, $\chi^2(1, N = 310) = 25.18$, $p < 0.05$; middle-aged sample: positive events = 68% continuation of chapters versus negative events = 49%; $\chi^2(1, N =142) = 8.06$, $p < 0.05$).

We then compared chapter characteristics for positive and negative future events (Tables 2 and 3). In the young sample, negative future events were perceived to be a continuation of chapters starting earlier in life compared to positive future events (but no effect for end age of chapter). The middle-aged sample did not show this difference. For both samples, negative future events were a continuation of more

negative chapters than positive future events. In addition, for both samples, positive and negative future events were both more likely to be related to ongoing chapters compared to positive and negative past events.

Temporal distance of emotional past and future events

We examined whether negative past and future events were more distant in time than positive past and future events (see Table 1). For both samples, we ran a 2-way repeated ANOVA with time (past, future) and valence (positive, negative) as the independent variables and temporal distance in years as the dependent variable. For the young sample, positive past and future events were closer in time than negative past and future events ($F(1, 299) = 44.38$, $p < 0.05$). However, for the middle-aged sample, the distance travelled was not affected by valence ($F(1, 102) = 0.09$, $p > 0.05$). For the young sample, past events were closer in time than future events ($F(1, 299) = 61.01$, $p < 0.05$), but for the middle-aged sample, future events were closer in time than past events ($F(1, 102) = 123.25$, $p < 0.05$). For the young sample, there was no significant interaction between valence and time ($F(1, 299) < 0.05$, $p > 0.05$). For the middle-aged sample, however, the main effect of time was qualified by a significant interaction with valence ($F(1, 102) = 8.75$, $p < 0.05$). The interaction was due to negative future events being more distant than positive future events ($t(109) = 4.09$, $p < 0.05$), while there was no difference in distance for positive and negative past events ($t(137) = 1.59$, $p > 0.05$). In summary, the young group travelled further into the future and the middle-aged group travelled further into the past. But both groups travelled the longest into the future when identifying negative future events.

The emotional content of life stories and personality

In order to examine whether personality traits were related to the emotional content of the life story, we ran a series of Spearman's correlations. For both samples, individuals high on Neuroticism reported more negative chapters, while individuals high on Extraversion reported more positive chapters (see Table 4). Surprisingly, highly Conscientious individuals also identified more positive chapters.

Regarding the emotional content of positive events in the past and future, Extraversion showed consistent patterns of correlations in the expected direction for both samples. But there were no relations with negative future events. For both samples, individuals scoring high on Neuroticism identified more negative past events (owing to the direction of the scale this correlation is positive). Neuroticism showed no relationship with negative future events. Regarding the other personality traits, Openness showed the highest number of correlations with emotional content in both directions, being associated with more intense negative past events as well as more intense positive future events.

Discussion

Both the young and the middle-aged sample had generally positive life stories and had more chapters beginning during adolescence and young adulthood, which is in agreement with previous studies of chapters (Thomsen & Berntsen, 2008; Thomsen et al., 2011) and with studies showing that many temporally extended self-images are formed during this period (Rathbone et al., 2008). This is consistent with the idea of a generally positive life story that develops during adolescence and young adulthood (Fitzgerald, 1988; Habermas & Bluck, 2000). The chapters starting during

this period tended to be more positive than chapters starting in late childhood and middle-age, which is consistent with the finding that individuals' most positive chapters stem from young adulthood, whereas negative chapters are more evenly distributed (Thomsen et al., 2011).

For both the young and the middle-aged sample, we found that negative future events were less likely to be a continuation of chapters than positive future events, and that negative future events were temporally more distant than positive future events. In addition, the emotional content of negative future events was not related to Neuroticism (see also Rubin, in press).

Extraversion and Conscientiousness were consistently associated with more positive chapters, whereas Neuroticism was associated with more negative chapters. In addition, Extraversion was associated with more intensely positive past and future events while Neuroticism was associated with more intensely negative past events.

Chapters in relation to emotional past and future events

We expected that negative past events would be less likely than past positive events to be a part of chapters and would be more temporally distant. While the findings for the young sample were consistent with this idea, the findings for the middle-aged sample did not show this pattern. This may suggest that differences between positive and negative past events in the young sample occur, because they are in a positive part of their lives, as evidenced by the positive emotional content generally found for young adulthood (Figure 2). Consistent with previous studies, the middle-aged participants located positive events and chapters in young adulthood

rather than the temporally near past (Berntsen & Rubin, 2002; Thomsen et al., 2011).

Individuals are thought to locate important positive memories and chapters to this

period, because of a positive focus in the life story in this period (Glück & Bluck,

2007), or because cultural norms emphasize this period as important and happy

(Berntsen & Rubin, 2004).

Most positive and negative past events were a part of emotionally

congruent chapters for both the young and the middle-aged sample. This is consistent

with the suggestion that chapters guide the identification of life story memories

(Thomsen & Berntsen, 2008; Thomsen et al., 2011). The middle-aged sample

identified life story events, which were often from the beginning of chapters

(Thomsen & Berntsen, 2008, Thomsen et al., 2011; 2012). This indicates that events

selected to be important for the life story are perceived to be the starting point of a

thematically linked series of events that may constitute a chapter in the life story.

Such linking between memories is a central characteristic of self-defining memories

(Singer & Salovey, 1993), and we suggest that self-defining memories are often

perceived as off-setting a thematically-related stream of events that may become a

chapter in the life story. In this way, the self-defining memory becomes a symbol of

a theme in the life story, which can be told to others as a vivid and engaging story.

However, the lack of a beginning effect for the young sample suggests that chapters

may not always direct the memory search towards the beginning. Still, the lack of an

effect may also be due to the young sample reporting shorter chapters (more than 67

participants had chapters of 1 year or less), where a beginning effect could not be

examined.

Negative future events were less likely to be perceived as a continuation of chapters and were temporally more distant than positive future events for both samples (see Rasmussen & Berntsen, 2012; Sharot, Riccardi, Raio, & Phelps, 2007 for similar findings). The middle-aged sample was more likely to omit negative future events than positive future events. This suggests that across age groups, the negative future is minimized to a higher degree than the negative past. This is consistent with the finding that negative possible selves are considered less often than positive possible selves (Markus & Nurius, 1986). In addition, the emotional content of negative future events was not related to Neuroticism, although other life story events showed the expected correlations with traits (see also Rubin, in press). That the negative future is less likely to be considered a part of the life story and is unrelated to personality traits may indicate that the negative future is not a part of the explicit personality system, perhaps because of defensive mechanisms. Avoiding negative future events, perceiving them as discontinuous with the past and far into the future, and generally not a part of one's personality may help the individual to maintain psychological health. Indeed, it has been suggested that some clinical disorders are characterized by a high focus on an expected negative future (Rubin, in press). In general, the findings for negative future events indicate that they are different from other event types, and hence that other processes may be involved in constructing negative future events.

Many positive future events were perceived as being a continuation of chapters. Also, both positive and negative future events were perceived to be a continuation of emotionally congruent chapters. This is consistent with the idea that

the construction of future events is influenced by chapters (D'Argembeau et al., 2012). Interestingly, future events were more likely than past events to be related to ongoing chapters, perhaps because ongoing chapters are associated with active goals, which prime future events that direct and motivate behavior (D'Argembeau & Mathy, 2011). Thus, ongoing positive chapters may prime the identification of positive future events that create an emotionally engaging representation of a possible future, which fuels motivation. Negative ongoing chapters, on the other hand, may prime negative future events associated with feelings of anxiety and pessimism.

The emotional content of life stories and personality

The findings are generally in agreement with predictions and previous studies (McAdams et al., 2004; McLean & Fournier, 2008; Raggatt, 2006), although the present study used self-reported emotional content and previous studies used observer-rated emotional content. That personality traits were related to the emotional content of chapters suggests that traits influence the organization of chapters as well as the selection and interpretation of events. Thus, a neurotic individual may focus on negative events and interpretations and link together these events, resulting in more negative chapters. Such a life story would convey negative meaning and self-understanding, and make the recall of positive events difficult. These processes may play a role in explaining why neurotic individuals experience a range of emotional problems (Ozer & Benet-Martínez, 2006). Supporting the idea that chapters are related to emotional problems, one study has shown that depressed individuals have more negative chapters (Dalgleish, Hill, Golden, Morant, & Dunn,

2011). If life stories play a part in explaining emotional problems, then targeting life

stories in interventions may be a possible strategy (e.g. White & Epston, 1990).

Conscientiousness was generally not related to the emotional content in

past and future events, but did show a relation to more positive chapters. This

indicates that Conscientiousness is not related to emotional reactions to specific

events, but to more general positive evaluations. One possible explanation is that

very conscientious individuals are highly disciplined, leading to better job

performance and fewer risk behaviors (Ozer & Benet-Martínez, 2006), which then

form the basis for such generally positive evaluations of chapters.

Age differences in the emotional content of life stories

When comparing the life story components between the two samples, the

middle-aged sample had more, longer, and less positive chapters. Considering that

the middle-aged sample had lived longer, it makes sense that they needed more and

longer chapters to adequately represent their life story (although the method, e.g.,

electronic versus paper-and-pen questionnaires may also play a role). The middle-

aged sample had less positive chapters than the young sample, which would appear

at odds with the finding that older adults show a stronger positivity bias in memory

than young adults (e.g., Kennedy, Mather, & Carstensen, 2004). However, the

middle-aged adults had a longer period of life to sample chapters from and the period

that extended beyond the young sample's would seem to be more negative (e.g.

middle-age, Figure 2), overall resulting in a more negative life story. Consistent with

the present age distribution of emotional content in chapters, studies have shown a

U-shaped distribution for well-being with young and late adulthood being associated

with higher well-being than middle-age (e.g., Stone, Schwartz, Broderick, & Deaton, 2010). The lower well-being in middle-age agrees with conceptions of a midlife crisis, but the reasons for this dip in well-being are still unknown. Content analyses of chapters starting during middle-age may help address this question.

Both the young and the middle-aged sample tended to identify past and future events that were some years away from the present. This result differs from other studies on the temporal distribution of past and future events, which have found that both types of events cluster closely around the present (e.g., Berntsen & Jacobsen, 2008; Spreng & Levine, 2006). The present results are probably due to the life story perspective, which invited individuals to emphasize long-term goals and thus project themselves further into both past and future. A previous study has found that young individuals travel further into the future and that older individuals travel further into the past (Spreng & Levine, 2006). This finding was replicated in the present study, presumably because both groups extended their mental time travel most in the temporal direction, where the largest part of their life story lies. The shorter future perspective displayed by the middle-aged sample is in accordance with socio-emotional selectivity theory, i.e., the notion that older individuals have a sense of limited time, with consequences for emotion-regulation and social activities (Carstensen, Isaacowitz, & Charles, 1999).

Conclusion and perspectives

The present study showed that life stories are positively biased, since negative future events were more often omitted, not perceived as a continuation of chapters, and were temporally more distant than positive future events. The study

also showed that personality traits were related to the emotional content of chapters as well as past and future events.

The present study confirms that chapters are an important part of life stories. This is consistent with recent suggestions from other researchers that semantic autobiographical knowledge plays an important role for maintaining self and identity (Prebble, Addis, & Tippett, 2012; Rathbone, Moulin, & Conway, 2009). Chapters also provided a window into how the life story is constructed at different periods of life, revealing both similarities, like a positive focus on the period between 15-30 years, and differences, like the middle-aged sample having more, longer, and less positive chapters than the young sample. Future studies could examine how the emotional content and complexity of chapters relate to other aspects of personality and well-being.

Chapters have received little attention in life story and autobiographical memory research, perhaps because chapters do not fit neatly into the episodic-semantic distinction of memory (Tulving, 1985; 2002). Although episodic and semantic memory refers to systems and not types of memory, the typical conceptualization of episodic memory is personally experienced events located at a specific time and place; whereas the typical conceptualization of semantic memory is abstracted knowledge about the world that cannot be located to a specific time and place. Chapters possess characteristics of both episodic and semantic memory. They are personally experienced (episodic) and abstracted knowledge (semantic). However, they are not "timeless" (p. 225, Tulving, 1984) as traditional semantic memory phenomena. Time information in chapters is necessary, because individuals

change (e.g., from a school girl to a working woman), and thus autobiographical abstractions are only accurate for a given period of time. Hence, chapters are an "impossible category" within the episodic-semantic distinction, and we suggest that this may have discouraged research in chapters, because the categories we adopt shape the realities we perceive. One implication of our research is, that the typical conceptualizations of episodic and semantic memory do not describe the full complexity of memory (see also Greenberg & Verfaellie, 2010; Renoult, Davidson, Palombo, Moscovitch, & Levine, 2012), and that research may benefit from adopting naturalistic approaches to identifying memory phenomena (e.g. Barsalou, 1988; Linton, 1986; Thomsen, 2009).

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Table 1

Means (SD) for life story chapter variables, past and future events and personality traits

	Young	Middle-aged	t
Number of chapters	6.23 (2.59)	11.04 (4.92)	11.61*
Average length of chapters (in years)	4.18 (1.95)	5.87 (2.85)	6.74*
Average emotion, chapters	5.23 (0.72)	4.93 (0.73)	4.25*
Positive past event, emotion	2.73 (0.49)	2.74 (0.47)	0.23
Time since positive past event (in years)	3.31 (4.63)	17.80 (12.20)	13.85*
Negative past event emotion	2.44 (0.70)	2.54 (0.68)	1.42
Time since negative past event (in years)	5.90 (5.28)	16.35 (13.87)	8.75*
Positive future event emotion	6.30 (0.63)	6.27 (0.59)	0.50
Time to positive future event (in years)	6.70 (5.05)	3.91 (4.55)	5.49*
Negative future event emotion	1.60 (0.67)	1.77 (0.97)	1.95
Time to negative future event (in years)	9.25 (11.59)	7.02 (7.11)	2.38*
Neuroticism	36.72 (8.12)	32.77 (8.65)	4.82*
Extraversion	42.20 (7.10)	43.14 (6.98)	1.36
Openness	43.28 (6.41)	43.10 (5.38)	0.32
Agreeableness	42.57 (6.27)	46.24 (5.63)	6.18*
Conscientiousness	43.25 (6.78)	45.65 (6.27)	3.68*

*) $p < 0.05$

Table 2

Differences in chapter beginning age, end age, length, emotional content, and whether the chapter was ongoing for past and future events (the young sample)

	Positive past event M (SD)	Negative past event M (SD)	Positive future event M (SD)	Negative future event M (SD)
Beginning age	$18.06 (4.76)^{b,c,d}$	$15.15 (6.82)^{a,c,d}$	$21.57 (6.07)^{a,b,d}$	$21.14 (5.30)^{a,b,c}$
End age	$20.51 (4.20)^{b,c,d}$	$18.78 (5.55)^{a,c,d}$	$23.54 (7.16)^{a,b}$	$23.11 (6.42)^{a,b}$
Length	$2.80 (2.72)^{b,c}$	$3.72 (3.61)^{a,c}$	$2.13 (3.35)^{a,b}$	$2.49 (4.12)$
Emotional content	$6.08 (0.99)^{b,d}$	$3.76 (1.79)^{a,c,d}$	$5.89 (0.97)^{b,d}$	$5.20 (1.62)^{a,b,c}$
Ongoing (0 = no, 1 = yes)	$0.11 (0.31)^{b,c,d}$	$0.04 (0.18)^{a,c,d}$	$0.31 (0.47)^{a,b}$	$0.29 (0.46)^{a,b}$

Note: [a]) significantly different from positive past events, [b]) significantly different from past negative events, [c]) significantly different from positive future events, [d]) significantly different from negative future events.

Table 3

Differences in chapter beginning age, end age, length, emotional content and whether the chapter was ongoing for past and future events

(the middle-aged sample)

	Past positive events M (SD)	Past negative events M (SD)	Positive future events M (SD)	Negative future events M (SD)
Beginning age	28.80 (9.11)[c,d]	29.30 (15.50)[c,d]	37.33 (14.22)[a,b]	35.90 (16.93)[a,b]
End age	33.91 (10.00)	32.44 (14.53)[c,d]	40.26 (14.89)[b]	34.84 (16.35)[b]
Length	6.74 (6.10)[b]	4.79 (5.20)[a]	6.64 (7.15)	6.41 (10.49)
Emotional content	5.94 (1.08)[b,c,d]	3.28 (1.86)[a,c,d]	5.79 (1.17)[a,b,d]	3.94 (1.82)[a,b,c]
Ongoing (0 = no, 1 = yes)	0.16 (0.37)[c,d]	0.12 (0.33)[c,d]	0.53 (0.50)[a,b]	0.51 (0.50)[a,b]

Note: [a]) significantly different from positive past events, [b]) significantly different from negative past events, [c]) significantly different from positive future events, [d]) significantly different from negative future events.

Table 4

Correlations between the emotional content of life story chapters (averaged across chapters), past and future events, and personality traits (young sample/middle-aged sample). Results that are consistent across the two samples are shown in bold.

	N	E	O	A	C
Emotional content in life story chapters	**-.42*/-.45***	**.33*/.21***	-.13*/.05	.10/.08	**.24*/.23***
Emotional content, positive past event	-.08/-.14	**.12*/.30***	.20*/.07	.11/-.01	.06/.11
Emotional content, negative past event	**.29*/.23***	-.19*/.01	**.21*/.22***	-.04/.09	.02/.01
Emotional content, positive future event	-.07/-.09	**.13*/.23***	**.17*/.22***	.05/.08	.14*/.13
Emotional content, negative future event	-.09/-.08	.03/.04	-.13*/-.09	-.02/-.02	-.02/.07

Figure 1

Percentage chapters starting across age for the young sample (upper panel) and middle-aged sample (lower panel)
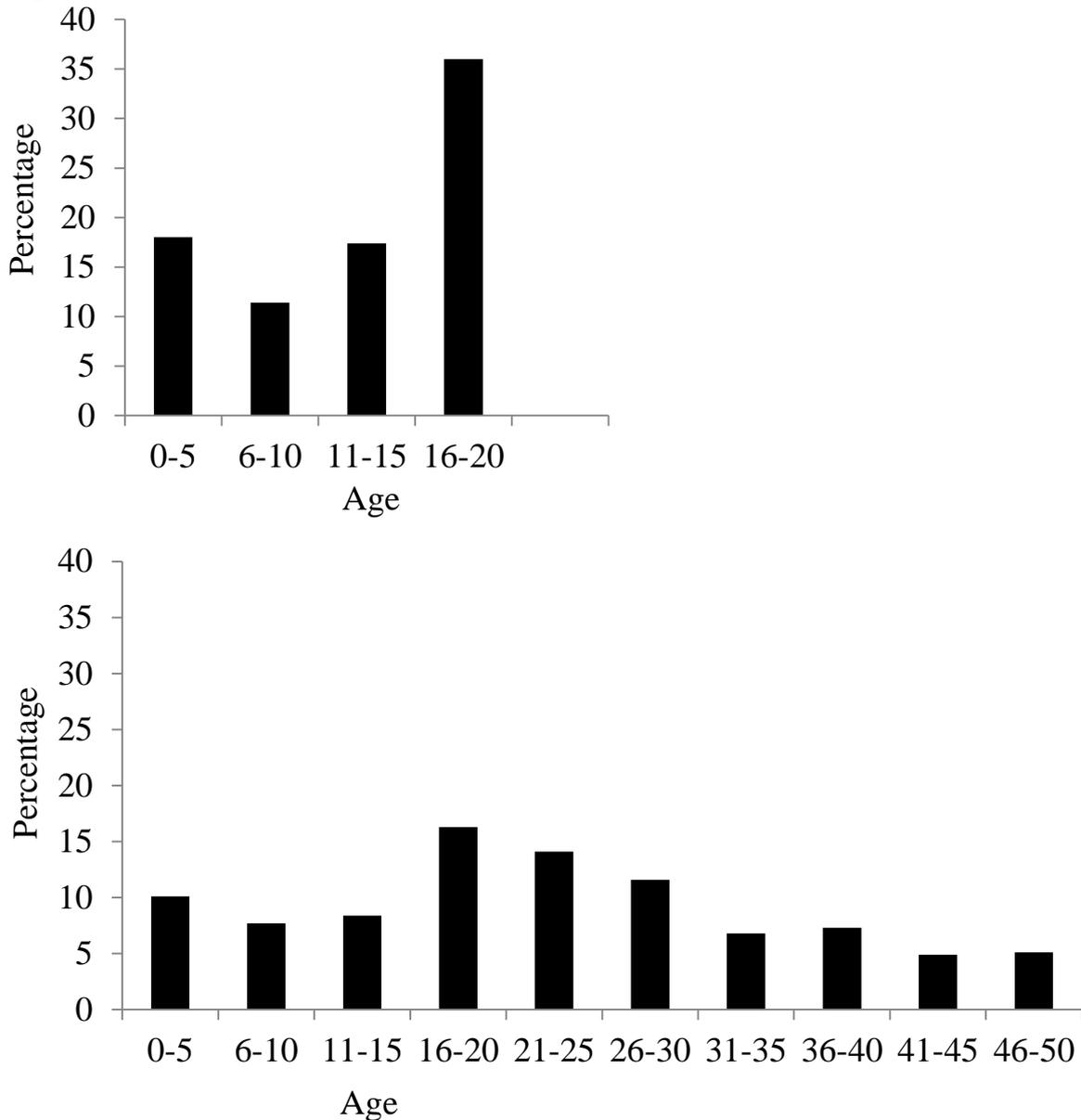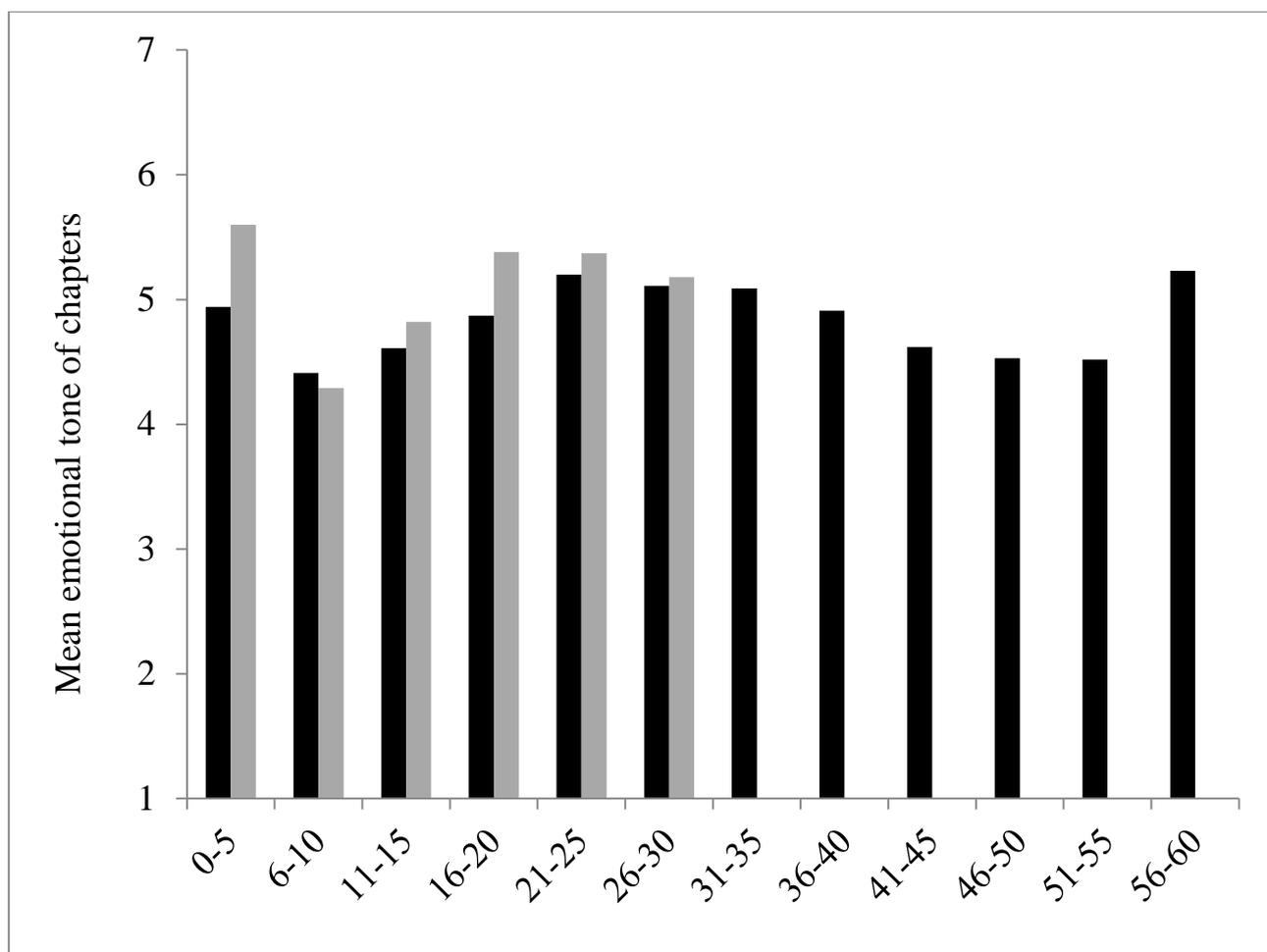

Note that for the young sample, age intervals over 20 years are not shown because many participants were too young to start chapters after age 20 and that for the middle-aged sample, age intervals over 50 years are not shown because many participants were too young to start chapters after age 50.

Figure 2

Mean emotional content of chapters over the life span for the young sample (grey bars) and the middle-aged sample (black bars)

Note: For each sample age intervals with less than 30 chapter starts are not shown.

Figure 3

Temporal placement of positive and negative past event (white/black bars) within chapters for the young sample (upper panel) and the middle-aged sample (lower panel).
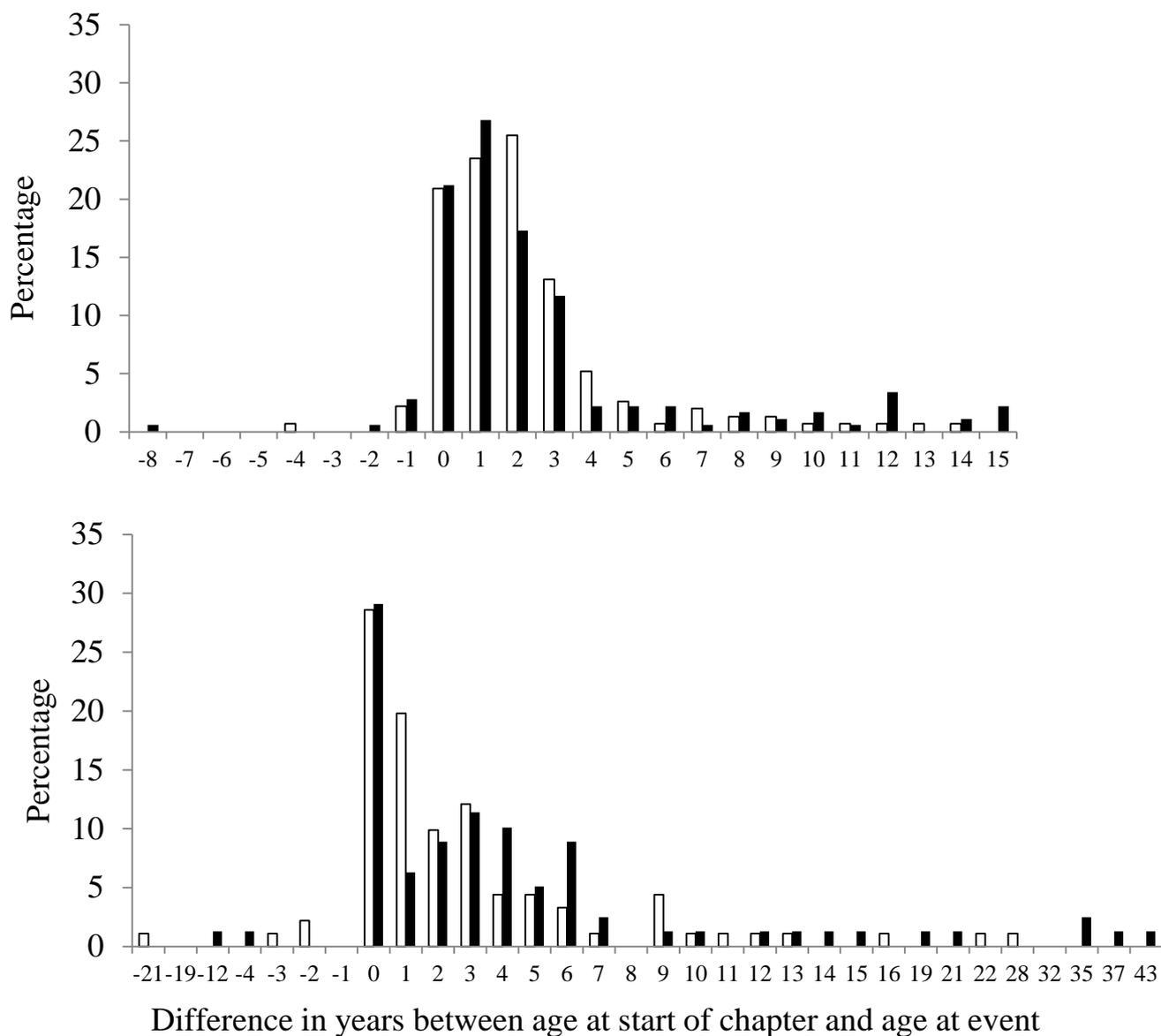
Note that for the middle-aged sample (lower panel) the x-axis for -21 to -5 and for 16-43 is compressed.

Appendix 1

Detailed instruction for past and future events

Past positive/negative event: "Please identify a high/low point, or maybe *the* high/low point, in your life story. A high/low point refer to (only for low point: the opposite of a high point and is) an event, where you experienced very positive/negative emotions, like joy, pride, enthusiasm, great happiness, deep inner peace/anxiety, grief, anger, depression, despair, guilt or other positive/negative emotions"

Future positive/negative event: "Please identify a positive/negative future scenario in your life story. A positive/negative future scenario should encompass what you would like to happen in your life in the future, including the goals and dreams you may achieve or realize/what you fear may happen to you in the future, but that you hope will not happen. Please select a realistic scenario."

Appendix 2

Example of positive and negative events being a part or continuation of chapters (female, 56 years)

Negative past event (the chapter it is a part of in brackets)

Age 33: "I am standing at my dead brother's stretcher at the hospital. My sister in law – his young wife – tries to make me relate to his dead body (temperature) and the situation generally. It is so difficult for me to stay in that room and I go to stand close to the wall at the foot of his stretcher." (Chapter 14: "My brother dies in a traffic accident. He was psychologically unstable and marked by our insecure childhood. I still miss him." Age 33-33)

Positive past event (the chapter it is a part of in brackets)

Age, 33: "I'm giving birth to our second child. The birth takes time but I receive so much support from my husband and our competent and caring midwife (who also assisted when I gave birth to our first child). Right after the birth of the most perfect child I have this surreal experience of seeing my dead brother reaching down from the ceiling and giving me the child. Time stands still and I feel an intense happiness. The birth takes place 6 months after the death of my brother." (Chapter 12: "We had a daughter in 85, a son in 88 and another son in 92. I feel extremely wealthy." Age 30-37)

Positive future scenario (the chapter it is a part of in brackets)

Age 80: "I am old and wise, sitting on a bench in the garden enjoying the present moment and my life. My husband sits in his sofa chair and then goes to gently weed the garden. Our three children come by with their children and spouses for a cup of coffee, tea and freshly made juice." (Chapter 17: "I meet my husband in high school. We married in 1990". Age 21-present).

Negative future scenario (the chapter it is a part of in brackets)

Age 57: "I fear to lose my husband or one of my children. Almost on a daily basis I worry about this. If my husband arrives a bit later than expected, if I cannot contact my children who are travelling, then my inner alarm bells start sounding." (Chapter 2: "The centralizing of my father's workplace was so difficult for him that he committed suicide." Age 7-10)