How stable is the personal past?

Stability of most important autobiographical memories and life narratives across eight years in a lifespan sample

Christin Köber & Tilmann Habermas
Department of Psychology, Goethe University Frankfurt

Published as: Köber, C., & Habermas, T. (2017). How stable is the personal past? Stability of most important autobiographical memories and life narratives across eight years in a lifespan sample. *Journal of Personality and Social Psychology, 113,* 608-626. doi 10.1037/pspp0000145

Data were collected and prepared by Cybèle de Silveira (wave 1), Alexa Negele and Verena Diel (wave 2), and Anda Constantinescu and the first author (wave 3). The studies were supported by the German Research Foundation (DFG, grant #HA2077-6, wave 1; grant #HA2077-10, wave 3) to the second author. The stability manual is based on earlier work by Alexa Negele and Hanna Peltzer. Life narrative stability was coded by Sima Gelfgat and Melanie Kühl, stability of most important memories was identified by Philipp Nicolay, global coherence was rated by Isabel Peters, and content of life narrative segments was coded by Yvonne Breyer and Katharina Hertje, all supervised by the first author. We thank Florian Schmiedek and Jean-Renaud Pycke for helpful statistical advice and Sonja Rohrmann and Katie Collier for valuable comments on earlier versions of this manuscript.

Christin Köber is now at the Department of Psychology, New York University Abu Dhabi, U.A.E. Correspondence regarding this article should be addressed to Christin Köber, Department of Psychology, P.O. Box 129188, Abu Dhabi, United Arabic Emirates. E-mail: christinkoeber@nyu.edu

Abstract

Considering life stories as the most individual layer of personality (McAdams, 2013) implies that life stories, similar to personality traits, exhibit some stability throughout life. While stability of personality traits has been extensively investigated, only little is known about the stability of life stories. We therefore tested the influence of age, of the proportion of normative age-graded life events, and of global text coherence on the stability of the most important memories and of brief entire life narratives as two representations of the life story. We also explored whether normative age-graded life events form more stable parts of life narratives. In a longitudinal lifespan study covering up to three measurements across eight years and six age groups (N=164) the stability of important memories and of entire life narratives was measured as the percentage of events and narrative segments which were repeated in later tellings. Stability increased between ages 8 and 24, leveling off in middle adulthood. Beyond age, stability of life narratives was also predicted by proportion of normative age-graded life events and by causal-motivational text coherence in younger participants. Memories of normative developmental and social transitional life events were more stable than other memories. Stability of segments of life narratives exceeded the stability of single most important memories. Findings are discussed in terms of cognitive, personality, and narrative psychology and point to research questions in each of these fields.

With the rise of a narrative approach, the conceptualization of personality was expanded to include the *life story*, or *narrative identity* (Erikson, 1968; Ricœur, 1991), as the most individual layer of personality (McAdams, 2013). By narrating the personal past and relating it to the present and future self, people succeed to integrate changes of life and of personality across time (e.g., Grysman & Hudson, 2010; McLean & Pratt, 2006; Pasupathi, Mansour, & Brubaker, 2007). Underlying this narrative approach to personality is the implicit assumption that the life story itself is moderately stable across the life span. This, however, has been studied only rarely. Therefore, the present longitudinal study attempts to complement research on the stability of personality by investigating the relative stability of narrative identity. We first introduce the conceptual framework, then present three kinds of life story stability and the evidence available to date, and finally suggest factors which may contribute to life story stability.

The Life Story

The life story is a theoretical concept, which is also termed narrative identity to stress that it is the most encompassing form to represent identity (McAdams, 2013). A rudimentary life story is assumed to be represented in memory, termed *life story schema* (Bluck & Habermas, 2000). As an empirical phenomenon, the life story shows both in entire *life narratives* as specific, but rare linguistic products covering the entire life, as well as, in a more piecemeal fashion, in *narratives of most important memories* covering single events. Life narratives are elicited asking for a narrative from the beginning of life to the present and can be short, as in our study, or may last several hours, whereas narratives of most important memories are elicited by more specific instructions to narrate self-defining memories (Singer & Salovey, 1993) or a variety of key events such as turning point or high and low point episodes (McAdams, 1993). Each narrative, produced at a specific point in time and directed at a specific audience, offers a specific version of either the entire life story (life narrative) or of a biographically salient episode of the life story (narrative of important memory). Narratives of important memories are much more frequent in everyday life than entire life narratives. They are part of the life story due to their biographical salience expressed in their links to other parts of life and to the development of the narrator's personality. These links are termed *autobiographical arguments* (Habermas, 2011).

Life Story Stability

Personality traits exhibit substantial stability across time and situations throughout life, especially after early adulthood (e.g., Allemand, Steiger, & Hill, 2013; Rantanen, Metsäpelto, Feldt, Pulkkinen, & Kokko, 2007; Roberts, Walton, & Viechtbauer, 2006; Wortman, Lucas, & Donnellan, 2012). Life stories, in contrast, are more prone to change because life is lived forward and new life events add up. In addition, new life events may lead to a change in the self-concept as well as reveal new insights into one's own personality (Pasupathi et al., 2007). Both may lead to revisions of the life story. Furthermore, life stories are expected to coherently relate life events to each other and to the individual's personality and development so as to convey a meaningful life. Thus, both new life events and changes in the self-concept may motivate change in the life story with the aim of recounting a story that still plausibly leads to

the narrator's present identity.

Basically, life stories may change in three ways: first by the way in which a life is narrated, interpreted, and evaluated, second by the choice of central narrative themes, and third by the selection or de-selection of events included in the life story. Measuring the stability of these three narrative characteristics requires comparing repeated life stories across extended periods of time, an undertaking called for some time ago (Thorne, Cutting, & Skaw, 1998). We briefly discuss and review existing evidence for the three kinds of stability.

A first feature of narrative stability is the degree to which a life is narrated, interpreted, and evaluated in the same way as in earlier tellings. While objective contents of a life event such as dates, places, persons involved or actions cannot plausibly be altered, its interpretation and evaluation may change. The social requirement to be able to provide a coherent account of one's story across change in central concerns and self-concept leads to the necessity to continuously adapt the life story as life is being lived (Josselson, 2009). Two studies using narratives of key life events found moderate stability of affective tone and complexity in emerging adults across three years (Dunlop, Guo, & McAdams, 2016; McAdams et al., 2006).

A second form of narrative stability is that of central themes. Central motives such as power, achievement, affiliation and intimacy may remain stable across differing evaluations and varying memories. Similarly, memories that as nuclear scenes (Tomkins, 1987) comprise central unresolved conflictual relationship themes may be expressed by similar memories with analogue affect and interactional patterns. Such affective themes in turn organize autobiographical memory, and persons show a tendency to interpret life situations in accordance with their themes (Demorest & Alexander, 1992). Therefore, dominant life themes may both enhance consistent recall and re-telling of the same life events as well as facilitate the recall of thematically similar life events (Conway, Singer, & Tagini, 2004; Williams & Conway, 2009). The study by McAdams and colleagues (2006) mentioned above found low to moderate stability of themes of communion and agency across three years, averaged across narratives of ten important memories.

The third form of life story stability is defined by the identity of events selected to be part of the life story across time. Change in the selection of events for inclusion in the life story may reflect change in the biographical salience of these events. The selection of events is not a dichotomous decision, but a gradual one, as events may be re-narrated in varying length and detailedness (Schank & Abelson, 1995). However, to include events repeatedly in the life story is a basic way of providing stability and recognizability to a life story. Consequently, this study aims to explore life story stability in terms of the proportion of events that are repeatedly included in the life story. When asking students for written narratives of ten key events from their lives, repeated selection of the same life events was low after three months (22.5%) and three years (17.2%; McAdams et al., 2006). Oral memory narratives of important life events with significant others were even less stable after six months (12%; Thorne et al., 1998) and five years (11.4%; Mackinnon, De Pasquale, & Pratt, 2016). The use of emotionally significant cues discrepant to the current self-concept for eliciting childhood memories led to a comparable stability rate, with students repeating only 22.2% of the same events when confronted with the same cues three years later (Strauman, 1996). When the stability of events included in the life story is measured by memories of single key events, it is influenced by how distinct the elicitation of memories is. This shows when asking for earliest memories which appear to be

much more stable than less specifically defined key events. A large majority (82%) of women nominated the identical event when asked for their earliest memory once a year over a four-year period and re-narrated it in a similar fashion in regard to length, chronology, content, and coherence (Bauer, Tasdemir-Ozdes, & Larkina, 2014). Similarly, over half of a group of women interviewed at ages 21, 33, and 43 consistently chose the same two earliest memories (Josselson, 2000). Even without asking for a highly specific kind of memory but for an entire life narrative resulted in a higher stability than asking for narratives of separate key events: two 20-year-olds (from the sample of the present study) repeated 30% of all events when retelling their lives after four years (Negele & Habermas, 2010).

Across the three forms of life story stability, adapting the personal past to the present does have its limits in the memories of others. Life stories need to concur with others' versions of the past and to be validated by others. Hence, the life story needs to satisfy both claims of veridicality, demanding the life story to be true to past events, and of coherence, demanding the life story to lead coherently and plausibly to the present identity (Conway et al., 2004). This tension justifies the expectation that people will show a certain degree of life story stability, as some studies have indeed shown.

Factors Influencing Life Story Stability

We discuss four factors that possibly influence the stability of the life story, starting with the method of measurement of the life story, continuing with the degree to which a life story contains normative life events, the coherence of the life narratives, and individual development as indicated by age.

Entire Life Narratives and Narratives of Important Memories

While narratives of single important life events provide some of the building blocks of the life story, life narratives cover entire lives, starting with birth and ending with the present or an outlook onto the future. Many different life events are expected to be included in life narratives and to be related to other parts of life and to the narrator's personality development up to the present. Asking for broadly defined single important memories may produce a recency effect due to the greater similarity of recent memories to the current self-concept (Conway et al., 2004), and may thus lead to selecting different, more recent events in retellings, especially after longer time intervals.

Asking for an entire life narrative, in contrast, typically requires starting with birth (Lejeune, 1986) and covering the entire lifespan in the narrative, presumably facilitating a more stable selection of life events in repeated life narratives compared to asking for broadly defined kinds of important life events such as turning point events.

Normativity of Life Events

Cultural norms, termed *cultural concept of biography* (Habermas & Bluck, 2000), define what a life narrative should look like. At its core is a set of biographically salient developmental and social normative age-graded life events such as learning to speak, entering school, puberty, marriage, or retirement, with age norms denoting when in life these events are expected to happen, termed *life script* (Berntsen & Rubin, 2004). Moreover, these normative life events are transitional, leading to enduring changes in one's life and identity, and thus mark the beginning

and end of lifetime periods (Brown, Hansen, Lee, Vanderveen, & Conrad, 2012; Thomsen, 2015). Consequently, normative age-graded life events tend to be biographically salient, guiding the selection of events for a life narrative, and helping to establish a chronological order. They offer a kind of skeleton for constructing life narratives (Collins, Pillemer, Ivcevic, & Gooze, 2007; Hatiboğlu & Habermas, 2016; Rubin, Berntsen, & Hutson, 2009). Therefore normative age-graded life events may be more stable than other life events so that including normative age-graded life events may enhance life story stability.

Global Text Coherence

The basic way to organize narratives of any kind is to imitate the sequence of events by narrating them in chronological order. Indeed, when asked for entire life narratives, most people above the age of 10 are likely to start at birth and then to narrate their lives more or less chronologically (Köber & Habermas, 2017). Chronological narrating is supported by serial cuing; what has been recalled provides cues for what is to be recalled next (Rubin, 1995). Thus, telling one's life chronologically from the beginning to the present may lead to a more stable selection of events than narrating single important memories selected independently from each other.

The sequential narrating of an entire life also helps integrating events into the life story. Crafting coherent connections between elements increases the depth of information processing (Craik & Lockhart, 1972), which in turn increases long-term memorability for the interconnected events (Lehman & Schraw, 2002; Mar, 2004; Peterson, Morris, Baker-Ward, & Flynn, 2014; Radvansky, Copeland, & Zwaan, 2005). For life narratives to be intelligible, global coherence of the entire life narrative is crucial and has been defined in regard not only to temporal coherence achieved by chronological narrating, but also to causal-motivational and thematic coherence (Habermas & Bluck, 2000). Causal-motivational coherence is created by providing insight into causes, motivations, and consequences of past events and actions. Thematic coherence is created through dominant life themes. We expect all three aspects of global text coherence of life narratives to contribute to the stability of the selected events in entire life narratives. However, because temporal and especially causal-motivational coherence are based more on specific life events than thematic coherence, they may contribute more to stability of event selection than thematic coherence.

In addition to memory-enhancing effects of global text coherence, causal-motivational coherence may enhance life story stability also in a more specific way by buffering against the pull to change the past to fit the present self-concept. Some of the autobiographical arguments that contribute to causal-motivational coherence (Köber, Schmiedek, & Habermas, 2015) serve to explain personality change which creates self-continuity across change (Habermas & Köber, 2015a). This creation of self-continuity by explaining how the person has changed should bolster the stability of life narratives in the long run, because it allows earlier personality characteristics to remain in the life story. If, in contrast, biographical change is not explained, there is a much stronger pull to change the past to fit the present, because then the past appears to contradict the present self. For example, a semester abroad may have rendered an originally insecure student more self-confident, and she uses autobiographical arguments to make this personality change plausible to others and herself, leading to a developmental story high in causal-motivational coherence. However, if the student does not explain the change in self-confidence, leading to a life narrative low in causal-motivational coherence, both the

semester abroad and the earlier insecurity may be omitted in subsequent life narratives for the sake of achieving a consistent self-presentation.

Thematic coherence stresses similarities between life events. It is constituted by how well the different parts of a life and the narrator's personality match thematically. The study by McAdams and colleagues (2006) suggests that stability of themes does not depend on a stable event selection, so that global thematic coherence does not need to contribute to stability of event selection in life narratives. However, when dominant life themes are made explicit, for example by using metaphors (e.g., "You need to fight to win in life."), those life events that substantiate these themes may be told repeatedly. Indeed, one study found older adults to hold on to a personal main metaphor (e.g., "Life is difficult") on which they hung their reported three self-defining memories (McLean, 2008). This suggests that global thematic coherence, at least in its explicit form, might also contribute to a more stable selection of events in entire life narratives.

Development of Identity and of the Life Story

Although earlier studies (Dunlop et al., 2016; McAdams et al., 2006; Strauman, 1996; Thorne et al., 1998) did not investigate a possible influence of age on life story stability, we do expect change in life story stability across the lifespan. The development of personality on the one hand and of socio-cognitive competencies for remembering and narrating on the other hand are two possible developmental influences.

Personality traits become somewhat more stable when people start settling down in emerging adulthood (Lucas & Donnellan, 2011). Because several studies have shown that personality traits shape narrative identity (Lilgendahl & McAdams, 2011; Lodi-Smith, Geise, Roberts, & Robins, 2009; McAdams et al., 2004; Raggatt, 2006; Thomsen, Olesen, Schnieber, & Tønnesvang, 2014), and considering the theoretical claim that traits and life stories manifest two different levels of personality (McAdams, 2013), we assume that the increase in stability of traits should to some degree be mirrored by a parallel increase in the stability of the life story.

On the other hand, the ability to construct a life story is absent in children and develops only during adolescence and early adulthood. First, the cultural concept of biography, or life script, is acquired in early adolescence and helps constructing a rudimentary life story of normative life events (Bohn & Berntsen, 2008; Habermas, 2007). Second, while the ability to provide narratives of single events such as important memories is acquired in late childhood (Bohn & Berntsen, 2008; Peterson & McCabe, 1983), the ability to provide life narratives with causal-motivational coherence develops throughout adolescence and thematic coherence in life narratives increases up to mid-adulthood (Köber et al., 2015). Other findings point to an emphasis on thematic coherence and stability of personality in older adults' narratives of self-defining memories (McLean, 2008). Thus, thematic coherence might also predict stability of life narratives, but perhaps only in older adulthood. Overall we expect life story stability to increase with age up to mid-adulthood. We expect this age increase to be partially explained by an inclusion of more normative life events, which we expect to be more stable than other events, as well as by an increase in the global coherence of life narratives.

Hypotheses

In line with earlier studies of the stability of memories (Bauer et al., 2014; Josselson, 2000; McAdams et al., 2006; Strauman, 1996), we assessed the stability of life stories in the basic sense of the stability of the selected events. We asked both for the nomination of seven most important memories as well as for narratives of the entire life. Our goals were to determine how stability of selected important memories and of entire life narratives develops throughout the lifespan and how the expected increase with age is explained by the inclusion of normative life events and an increase in life narrative coherence.

First we expected an increase of stability of important memories and of life narratives between late childhood and middle adulthood as well as a decrease of stability with the time interval between the tellings. Second, we expected the proportion of normative life events to predict stability above and beyond age. Third, we hypothesized that global coherence of life narratives, which increases across adolescence up to middle adulthood, predicts stability of life narratives above and beyond age, time interval, and proportion of normative life events. Fourth, we expected normative age-graded life events to be more stable than other life events. Fifth, we expected the stability of entire life narratives to exceed the stability of the list of most important memories.

Methods

"Coherence and stability of the life story across the lifespan" was approved by the Research Ethics Committee of Fachbereich 05 Psychologie und Sportwissenschaften of the Department of Psychology, Goethe University Frankfurt (#2010-3) on April 8, 2010.

Participants

This longitudinal study started in 2003. Measurements were repeated in 2007 and 2011. In 2003, a total of 113 participants, about equally assigned to four cohorts aged 8, 12, 16, and 20 years, provided one life narrative, 105 of whom also provided a second life narrative two weeks later. In 2007, a total of 104 participants (dropout 7.96%), and in 2011 a total of 99 participants recounted their lives again (8-year dropout 12.39%). Additionally, in 2007, two adult cohorts aged 40 and 65 years (N=28 and 30) were added to test development in adulthood, of whom 51 participated again in 2011 (dropout 12.1%)[1]. Gender was about equally distributed in the six cohorts (Table 1).

In 2003, the youngest cohort was the higher achieving half of third graders from an elementary school, while cohorts 2, 3, and 4 were present or former students of a German higher-track high school (Gymnasium). Its mixed social composition, mainly middle class with a substantial proportion of lower class backgrounds, was comparable to that of the elementary school population. The adult cohorts 5 and 6 were recruited via flyers and among continuing education university students. In 2011, all six cohorts were well educated. The majority (73.8%)

[1]This paper is part of a series that probes a data set involving the longitudinal collection of life narratives over an eight-year period in order to study how the telling of a life narrative develops over the life span. In this study, we included only those individuals who participated at least twice in order to compare their important memories and life narratives. Hence, the number of participants and age values differ slightly from those published elsewhere. A complete list of other publications analyzing partly or entirely this three-wave longitudinal data set in very different ways is provided in the appendix of this publication.

was about to or had graduated from school with the highest German school degree (Abitur), 18.9% had graduated after 10 years of school (Mittlere Reife), and 0.6% had no school degree. Those who did not participate in 2011 and had still been in school when last tested made up the remaining 6.7%. A good third (34.2%) of the participants had at least one parent born outside Germany. A migrant background was present in roughly half of each of the four younger cohorts, but in fewer of the two oldest cohorts, reflecting generational change. All participants spoke German fluently. They were recompensed with 20 Euros in 2003 and 40 Euros in 2007 and 2011. Each time, we contacted participants up to three times by letter, then via email, phone, and social media, and obtained parental informed consent for minors.

Procedure

In 2003, the four youngest cohorts were tested twice, 2 weeks apart, by two different (out of three) female interviewers. In 2007 and 2011 all six cohorts were tested only once by new female interviewers unknown to the participants. Thus across measurement times participants in the four younger cohorts provided up to four times seven most important memories and up to four entire life narratives, and participants in the two older cohorts provided twice seven most important memories and twice an entire life narrative. In total 3649 most important memories and 523 life narratives of 164 participants were provided throughout up to eight years.

Material

Seven most important memories and life narratives. Participants wrote their seven most important memories on index cards and put them in chronological order on the table in front of them. This had originally served to make sure that life narratives also contained specific events and to reduce the memory load, especially for the youngest cohort. Here the task serves as a measure of the stability of single important memories. Participants were asked to narrate their life for about 15 min without being interrupted. They were instructed to include the seven most important memories and to tell their life so as to explain how they had become the person they are at the present. Participants were required to tell not only their nominated seven most important memories, but all life events they deemed relevant. Interviewers only encouraged to continue, but asked no questions (for verbatim instruction cf. Habermas & de Silveira, 2008).

Dividing narratives into propositions. After a verbatim transcription, all life narratives were divided into propositions, which correspond to main or subordinate clauses. All propositions were consecutively numbered to count the total number of propositions per life narrative (Table 2). For each wave, two coders independently divided 40 life narratives into propositions and agreed on between 96.2% and 98.6% of propositions. Each of the two coders divided half of the remaining life narratives into propositions.

Dividing narratives into segments. Then life narratives were divided into thematic segments comprising at least four propositions. The prototype of a segment contains a specific, datable event (Table 2), but segments can also contain recurrent events, descriptions, or evaluative summaries. When a segment border was marked in the same or immediately neighboring proposition, this counted as agreement between raters. For each wave, two research assistants independently segmented until 32 consecutive life narratives reached an interrater reliability of Cohens' $\kappa = .80$. Then each coder segmented half of the remaining

narratives. To check the quality of the ensuing segmenting we calculated an additional control reliability based on all segments of another randomly chosen 16 narratives, which were unknown to the respective main coder, ranging from Cohens' κ = .81 to Cohens' κ = .92 throughout all measurement times. Disagreements in the narratives used to measure interrater reliability were resolved by discussion.

Assessing stability. We defined life story stability as the percentage of the seven most important memories and of segments of entire life narratives that were mentioned again at a later measurement. Comparing the four measurement times of the younger subsample resulted in up to six comparisons across three different time intervals (Table 3). First, there was a two-week time interval between the first and the second seven important memories and the first and the second life narrative. Second, there was a four-year time interval between the first or second seven important memories and life narrative provided in 2003 and the third seven important memories and life narrative provided in 2007. Third, there was a second four-year time interval between 2007 and 2011. Finally, the longest time interval of eight years occurred between 2003 and 2011 (Table 3). To reduce the amount of data to be tested, comparisons of the first and second measurements in 2003, which were only two weeks apart, with 2007 and 2011 respectively were averaged. Because participants in the two older cohorts participated only in 2007 and 2011, solely the second four year-interval from 2007 to 2011 allowed cross-sectional testing of stability in all six cohorts.

Stability of seven most important memories. All seven most important memories written on index cards at one measurement point were compared to each of all subsequent measurements to judge whether the memories were repeated or not (Tables 2 and 3). Because judgments of the identity or non-identity of memories (written on index cards with a few words) were unambiguous, no interrater reliability was calculated. However all judgments were double checked by the first author. The resulting percentage for each pairwise comparison (e.g., Time 1 with Time 2, Time 1 with Time 3, etc.) indicates the portion of the seven important memories that was repeated at a later time. Participants produced a total of 3649 most important memories.

Stability of life narratives**.** Likewise all segments of all respective earlier life narratives were compared pairwise to all segments of life narratives of all subsequent measurements. Life events defined as normative age-graded events (see "Normativity of life events" below) such as beginning school or marriage were coded as having been repeated in the respective later life narrative if they were mentioned in at least one proposition. All other kinds of events needed to be mentioned in at least two propositions in the respective later life narrative to be coded as having been repeated, i.e. as being stable over time. We chose this different treatment, because normative age-graded events are not necessarily fleshed out in detail, but serve as temporal indicators ("after graduation from high school…") or are rather described by their consequences ("since the wedding…"). However, given that normative events usually mark life transitions, they were usually mentioned in more than one proposition.

Interrater reliability for stability of life narratives was Cohens' κ = .95 based on two coders' independent coding of 12 participants, two of each cohort, including 50 pairwise comparisons of altogether 38 life narratives containing altogether 738 segments. The control reliability was Cohens' κ = 1.00 based on six participants, one per cohort, including 26 pairwise comparisons of 20 life narratives containing altogether 410 segments. A total of 523 life

narratives containing altogether 10.163 segments were produced by the participants.

Please note that stability of life narrative segments was assessed independently from stability of most important memories; i.e., if events were repeated in later life narratives, but not chosen as one of the seven important memories, they counted as stable in life narratives, but not as stable important memories. For example, Benjamin wrote "doing karate" on an index card as one of his most important memories in both 2003 and in 2007 (cf. Table 2), but he no longer chose it as one of his seven most important memories in 2011. However, Benjamin still spoke about karate in his life narrative of 2011. Thus, karate is a stable life narrative segment across eight years, but a stable most important memory only across the first four years.

Normativity of life events. All most important memories and all segments of life narratives were attributed to one of 97 possible event categories, of which 68 were taken from Berntsen and Rubin (2004) and Habermas (2007). Additional 29 event categories, taken from the life narratives of the adult cohorts, were added in order to cover life story events of the entire life span. Interrater reliabilities for all 97 event categories were Cohen's $\kappa = .84$, based on 32 life narratives, and control Cohen's $\kappa = .74$, based on 16 life narratives. Of the 97 event categories we then classified 32 as developmental (e.g., begin walking, puberty, first falling in love, first sex, marriage, having children, menopause) and 15 as social *normative age-graded life events* (e.g., baptism, begin daycare, entering school, confirmation, end of grade school, end of high school/beginning, College, leaving home, first job, retirement), or as *other events* including 17 non-normative negative life events without normative timing (e.g., divorce, other's death, severe illness/accident, loss of job, parents' separation, war memory), 33 other kinds of life events (e.g., events during College time, major achievement, getting to know someone, migration, leisure activities) and idiosyncratic events.

Global text coherence. We used three 7-point scales to rate the overall temporal, causal-motivational and thematic coherence of entire life narratives from the recipient's point of view: The scale of temporal coherence measured how well the reader is temporally oriented, counting as no coherence if one could never tell when and in what order life events occurred (value 1) and as highest temporal coherence if time and order of events were always clear (value 7). The scale of causal-motivational coherence measured how well a sense of a developmental trajectory is conveyed, counting as no coherence if no personality development became clear (value 1) and as highest causal-motivational coherence if the development of personality became clear including its turning points and their motives (value 7). The scale of thematic coherence measured how thematically coherent the life narrative is, counting as no coherence if the individual episodes were thematically totally disparate (value 1) and as highest thematic coherence if episodes, heterogeneous in content, were explicitly thematically linked to each other for instance by a metaphor (value 7; for more details see Köber et al., 2015). Interrater reliabilities for temporal orientation were $r_{IC} = .81$ and control $r_{IC} = .78$, for developmental consequentiality $r_{IC} = .81$ and control $r_{IC} = .78$, and for thematic coherence $r_{IC} = .86$ and control $r_{IC} = .83$. Different coders coded stability, life event categories, and rated global coherence ratings respectively.

Results

Correcting the Confounding of Time Interval with Age

Because the number of memories nominated and the amount of time allotted for narrating one's life was identical across age groups and measurements, narrators needed to squeeze new events from the past four or eight years into the new life narrative, possibly pushing out some of the older events. However this effect becomes smaller and smaller with age, because the proportion of life made up by the past four or eight years since the last telling of one's life decreases with age. To correct this confounding of stability with age, we multiplied the percentage of repeated most important memories and the percentage of repeated life narrative segments respectively by the age at the time of the later telling and divided it by the age at the time of the earlier telling (% repeated memories or segments*age2/age1). Thus, we ensured that time intervals and stability of life narratives were comparable between the participants regardless of their age.

Data Analysis Strategy

Due to the different numbers of measurements of the younger (8-28 years) and the older (40-69 years) participants, we tested hypotheses in two steps. The longitudinal development of stability of important memories and of life narratives was investigated in the four younger cohorts by linear growth models for repeated measures using maximum likelihood estimation in RStudio Version 0.98.994, procedure LMER in the lme4 package (Bates et al., 2013; Bates, Mächler, Bolker, & Walker, 2015). Different models were estimated to identify the best fitting one, that is, all possible combinations of fixed or random intercept (located at eight years of age) and fixed or random linear age slope were tested. Both effects of age and of time interval were modeled as linear trends in accordance with the hypothesized linear increase. Of the resulting models, the one with the smallest Akaike Information Criterion was chosen. Once the best fitting model was identified, a possible interaction between age and time interval was also tested.

We then proceeded to add more specific predictors of stability in a stepwise fashion, in order to test whether they predicted stability in addition to age (adding predicted variance) and in place of age (reducing the contribution of age). Therefore, we included in a next step the relative frequency of normative life events mentioned in the life story in 2003 by the younger subsample as an additional predictor of stability. Figure 1 shows that the relative frequency of normative life events increases up to late adolescence in most important memories and in life narratives. The figure also shows that at no age normative events make up more than half of all events.

Because stability for the entire sample could be assessed only once, across the last two measurement times (2007-2011), it was tested cross-sectionally by univariate analysis of variance (ANOVA). The additional predictors normativity of events and life narrative coherence were later entered as continuous predictors in ANCOVAs with age (6 levels) as between-subjects factor.[2] Outliers were corrected to the whiskers of respective boxplots for each cohort

[2] The analyses presented here all include the correction of stability for age to ensure that we control the confounding of proportion of repeated memories or segments with time interval and age. However, we also calculated all

and measurement in about 4.9% of all memory comparisons and in 2.4% of all life narrative comparisons.

Because the first and second hypotheses concern the stability of both the most important memories and the life narratives, we present the results for these two hypotheses first for important memories, and then for life narratives. Next we test the contribution of global text coherence to stability of life narratives (hypothesis three). Then, we compare the stability of normative life events with the stability of other life events (hypothesis four) to then compare the stability of most important memories with the stability of entire life narratives (hypothesis five).

Stability of Seven Most Important Memories

Effects of age and interval on the stability of seven most important memories. The best model for age differences in the stability of important memories written on index cards showed no systematic increase with age, but a systematic decrease with increasing time interval as well as a positive interaction of age with time interval (Table 4). Figure 2 shows a linear increase of age-corrected stability with age only for the two weeks time interval. In terms of absolute percentage of stability not corrected for age, on average the 8- and 12-year-olds repeated about 50% of their memories after two weeks, the 16- and 20-year-olds about 65% (Table 5). Yet, with increasing time interval, i.e., after four and eight years, only a few important memories were nominated again. For example, only one life event out of the seven that Benjamin nominated as most important memories in 2003 was nominated again in 2007 (start to do karate) and again only one in 2011 (entering high school). Thus, the stability of Benjamin's most important memories across the first four-year interval (2003 – 2007) was as high as that across the eight-year interval (2003 – 2011; Table 2). Accordingly, in the younger subsample there was neither a systematic increase of the stability of most important memories with age for the first four-year interval nor for the eight-year interval (Figure 2), contradicting hypothesis one in regard to seven most important memories.

Testing the last four-year interval for the entire sample, an ANOVA with age-corrected stability of important memories as dependent variable and age (6 levels) as the only factor showed a significant effect of age (Pillai's $F(5, 139) = 3.79$, $p < .01$, partial $\eta^2 = .12$). The highly significant linear contrast ($c = .19$, 95% CI [0.10, 0.28], $p < .001$) indicates increasing stability across four years (2007 – 2011) of most important memories from age 16 to 69 (Figure 2). While Benjamin at age 20 only repeated his move to Germany in 2011 from the seven most important memories chosen in 2007, Thomas at age 44 repeated three most important memories after the same time interval (Table 2), exemplifying the increase of stability of most important memories between early and middle adulthood.

Effects of proportion of normative life events on the stability of seven most important memories. Testing whether the relative frequency of normative life events of most important memories in 2003 predicts their stability over and above age and time interval in the younger subsample, we added the proportion of normative life events among most important memories

---

analyses with stability not corrected for age. All estimators were higher in absolute terms and all significant effects except one remained the same as the ones reported here. Additionally, one effect being marginally significant when tested with age-corrected stability was found clearly significant when tested with stability not corrected for age (see below).

as an additional predictor to the growth model we had run for testing the first hypothesis. We used the proportion of normative life events in most important memories mentioned in 2003 to predict their stability across four (2007) and eight years (2011). Including this additional predictor did not improve model fit nor did the relative frequency of normative events significantly predict stability of most important memories.

To investigate the influence of normative life events on stability in the entire sample, we used the proportion of normative life events in most important memories mentioned in 2007 to predict the stability of important memories four years later (in 2011). The ANCOVA with age (6 levels) as between-subjects factor and proportion of normative life events as continuous predictor revealed that the proportion of normative life events significantly predicts stability of most important memories, Pillai's $F(1, 138) = 10.88$, $p < .01$, partial $\eta^2 = .07$), in addition to age (Pillai's $F(5, 138) = 3.62$, $p < .01$, partial $\eta^2 = .12$). The finding that the effect size of age remains the same after adding normative life events as a predictor shows that the proportion of normative life events explains additional variance of stability, but not the age effect.

In sum, stability of most important memories decreased with greater time intervals and increased with age only from late adolescence to late adulthood. The selection of normative life events contributed to stability, in addition to age, only between late adolescence and late adulthood, without explaining the age effect. Thus, hypotheses one and two were only partly confirmed in regard to most important memories.

Stability of Life Narratives

Effects of age and interval on the stability of life narratives. The best growth model in the younger subsample showed a linear growth of stability with age, a decrease of stability with increasing time interval, and a positive interaction of age with time interval (Table 6). Thus, stability increased with age, decreased with time interval, but, as indicated by the interaction of age with time interval, the decrease due to time interval became smaller with age from early adolescence to young adulthood (Figure 2). Individuals also differed significantly in the effects of age (random effect of age).

Investigating stability of life narratives from 2007 to 2011 in the entire sample, an ANOVA with the stability of life narratives as dependent measure and age (6 levels) as only factor showed a significant effect of age (Pillai's $F(5, 139) = 13.15$, $p < .001$, partial $\eta^2 = .32$). The linear contrast ($c = .29$, 95% CI [0.22, 0.37], $p < .001$) was highly significant, indicating a linear increase in stability from mid-adolescence throughout adulthood. Figure 2 shows a linear increase of stability of life narratives up to age 28 and then a leveling-off in middle adulthood.

Effects of proportion of normative life events on the stability of life narratives. Testing whether the proportion of segments containing normative life events predicts their stability over and above age and time interval in the younger subsample, we added the proportion of normative life events in life narratives as an additional predictor to the growth model we had run for testing the first hypothesis for stability of life narratives. Again, we used the proportion of normative life events in 2003 to predict the stability of life narratives told four (2007) or eight years (2011) later. This improved model fit. The proportion of normative life events significantly

predicted life narrative stability above and beyond age, but did not interact with age[3] (Table 6). Comparing age estimators of both growth models (β = 0.020 vs. β = 0.018; Table 6) reveals that the influence of frequent normative life events explains a small part of the influence of age on stability, because the age estimator is lowered by the inclusion of normative life events. Altogether, this points to increasing life narrative stability from late childhood to middle adulthood as a function of age, time interval, and of the inclusion of normative life events in earlier life narratives.

In contrast, when adding the proportion of normative life events in 2007 as additional continuous predictor in the ANCOVA for the entire sample with age (6 levels) as between-subjects factor, it did not contribute significantly to the prediction of the stability of life narratives over and above age.

Effects of global text coherence on stability of life narratives. Testing whether the three aspects of global text coherence of life narratives predict the stability of life narratives over and above age, time interval, and proportion of normative life events, we then added the three coherence ratings as additional predictors to the growth model. We used the three global coherence ratings measured in 2003 to predict the stability of life narratives told four (2007) or eight years (2011) later. To determine the order in which to enter coherence ratings, we calculated their partial correlations with the stability of life narratives across all measurement times, partialling out age and time interval. The resulting order was causal-motivational coherence (r_p = .26), thematic coherence (r_p = .13) and temporal coherence (r_p = .11). If entering a coherence rating as predictor in the model significantly improved model fit, as indicated by a comparison of model deviancies with χ^2 tests, it was retained in the model before the next predictor was entered. Otherwise it was not included and the next predictor was tested. Only causal-motivational coherence significantly improved model fit in the younger subsample, interacting neither with age nor interval (Table 6). Comparing age estimators of both growth models (β = 0.018 vs. β = 0.008; Table 6) reveals that the influence of coherence reduces the influence of age on stability of life narratives substantially, that is coherence explains part of the influences of age on stability. This effect indicates that in younger participants at any given age and after any given time interval more causal-motivationally coherent life narratives remained more stable over time.

To investigate the influence of global coherence on stability over and above age in the entire sample, we again used the three global coherence ratings measured in 2007 to predict stability of life narratives told in 2011. We added the coherence ratings in a stepwise fashion as continuous predictors to the ANCOVA run earlier to test the first hypothesis for life narratives between 2007 and 2011. According to the coherence ratings' partial correlations with stability of life narratives with age partialled out, the order of entering predictors was temporal coherence (r_p = .23), thematic coherence (r_p = .04), and causal-motivational coherence (r_p = .04). If a predictor was significant it was retained, otherwise it was excluded. Then the next predictor was entered. Unexpectedly, no aspect of coherence significantly predicted stability. There was only a trend for temporal coherence, Pillai's $F(1, 138) = 3.64$, $p = .06$, partial $\eta^2 = .03$,

[3] This effect of proportion of normative events did not remain significant, when calculating with stability uncorrected for age ($\beta = 0.20$, $t(86.6) = 2.37$, $p > .05$), indicating that increasing uncorrected life narrative stability is a function only of age and time interval.

to predict stability of life narratives above and beyond age across adulthood.[4] Exploratory separate analyses of the interaction of temporal coherence with age revealed that temporal coherence predicted significantly the stability of life narratives above and beyond age in 44 year-olds (β = 0.13, t(11,133) = 2.33, p <.02) and in 69 year-olds (β = 0.14, t(11,133) = 2.36, p <.02).

Taken together, the stability of life narratives decreased with longer time intervals and increased with age. This function of age is partly explained by the increasing inclusion of normative life events and by increasing global life narrative coherence in younger ages, confirming hypotheses one to three in regard to life narratives for late childhood to young adulthood.

Comparing the Stability of Normative versus Other Life Events

The prediction of life story stability by the proportion of normative life events suggests that these are more stable than other life events. We therefore directly tested the stability of normative versus other events both in memories and in life narratives. Also, we identified the exact percentage of the stable normative and of other events across the entire duration of the study. First, we will compare the stability of normative vs. other most important memories and then compare the stability of life narrative segments containing normative life events with that of segments containing other life events.

Comparing the stability of normative versus other important memories. To test whether normative life events were more stable than other life events, we ran for the younger subsample another growth model, in which we compared the age-corrected percentage of normative events that were stable with the age-corrected percentage of other events that were stable as a function of age and interval. The best growth model (AIC = 5698.3) included a random intercept (β = 48.15, t(534.1) = 9.7, p <.001) at age eight, a fixed age slope (β = 0.36, t(486.4) = 0.5, p >.05), a negative fixed slope for time interval (β = -35.39, t(557.6) = -6.7, p <.001), and an interaction of age with time interval (β = 1.12, t(492.9) = 2.6, p <.05). More importantly, there was a negative main effect (β = -16.69, t(480.1) = -2.5, p <.01) indicating a significant difference in stability of normative versus other important memories averaged across all measurement times, a positive interaction of time interval with normativity or not of events (β = 22.03, t(480.1) = 3.0, p <.01), and a negative triple interaction of age, time interval, and normativity or not of events (β = -1.55, t(480.1) = -2.5, p <.05). Altogether this indicates an increasing advantage in stability of normative versus other life events with increasing time interval, although the greater stability of normative life events with greater time intervals tends to decrease with age (for the mean values uncorrected for age see Figure 3). That is, the younger the participant and the longer the time interval, the more normative age-graded life events are more stable than other life events. Benjamin exemplifies this trend: his only life event that was stable across eight years is normative (entering high school, Table 2).

To compare the age-corrected stability of normative versus other events for the period between 2007 and 2011, we ran a rANOVA with age (6 levels) as between-subjects factor and normativity of events (2 levels) as within-subjects factor. An age effect (Pillai's F(5, 139) =2.37, p

[4] When tested with stability not corrected for age, temporal coherence significantly predicted (Pillai's F(1, 138) =4.57, p < .05 , partial η^2 = .03) stability of life narratives above and beyond age across adulthood.

< .05, partial η^2 = .08), a main effect for normativity, Pillai's $F(1, 139) = 9.13$, $p < .01$, partial η^2 = .06, and a significant interaction of age with normativity of events, Pillai's $F(5, 139) = 2.51$, $p <$ .05, partial η^2 = .08, occurred, indicating higher stability of normative relative to other events with increasing age throughout adulthood (for the mean values uncorrected for age see Figure 3). The age-corrected mean percentage of stable normative age-graded events (M = 41.86; SD = 25.17) exceeded the mean percentage of stable other important life events (M = 30.95; SD = 45.45) across four years. Thus, between mid-adolescence and late adulthood, most important memories of normative age-graded life events were more stable than most important memories of other life events. Also Thomas exemplifies this trend (Table 2). Out of Thomas' three stable most important memories nominated in 2007 and 2011, two were normative life events (first long-term relationship and birth of first child).

To sum up, normative age-graded life events relative to all other events were more stable across longer time intervals at younger ages and more stable throughout adulthood, partly confirming hypotheses four in regard to most important memories.

Comparing the stability of normative and other life narrative segments. Turning to the stability of life narrative segments with normative age-graded life events versus segments containing other life events, we ran a mixed model for the younger subsample comparing the stability of normative age-graded life events with that of other life events. The best model (AIC = 5888.5) included a random intercept (β = 30.13, $t(430.6) = 6.3$, $p <.001$) at age eight, a fixed age slope (β = 1.71, $t(367.3) = 2.8$, $p <.01$), a negative fixed slope for time interval (β = -22.80, $t(612) = -5.0$, $p <.001$), an interaction of age with time interval (β = 0.82, $t(515.7) = 2.2$, $p <.05$), and a trend for higher stability of normative events (β = 10.53, $t(502.1) = 1.9$, $p =.061$). Also, there was an interaction of time interval with normativity of stable events (β = 19.54, $t(502.1) =$ 3.2, $p <.01$) and a negative triple interaction of age, time interval, and normativity of stable events (β = -1.34, $t(502.1) = -2.6$, $p <.01$). This indicates an advantage of normativity of events with increasing time interval which attenuates with increasing age as indicated by the negative triple interaction; that is, the older the narrator, the smaller the advantage of normative life events after longer intervals (for the mean values uncorrected for age see Figure 4). Again, Benjamin exemplifies this trend. While he did not repeat his idiosyncratic life events such as his eighth birthday party or the joy of getting the PlayStation (told in 2003) in his later life narratives, some of his normative life events such as his birth, primary school and his start into high school were repeated in 2007 and all were repeated in 2011.

To compare whether the normative life events are more stable than other life events in the entire sample, we ran a rANOVA with age (6 levels) as between-subjects factor and stability of normative versus other events (2 levels) as within-subjects factor. The main effect of age (Pillai's $F(5, 139) = 10.03$, $p < .001$, partial η^2 = .27) was confirmed. We also found a main effect of normativity of events (Pillai's $F(1, 139) = 15.46$, $p < .001$, partial η^2 = .10), but no interaction of age with normativity. Thus the age-corrected mean percentage of normative life events which are stable (M = 64.79; SD = 37.02) surpasses that of all other segments which are stable (M = 52.18; SD = 24.49) across four years in adulthood (for mean values uncorrected for age see Figure 4).

To sum up, normative age-graded life events tended to be included in life narratives more often repeatedly than other life events, confirming hypothesis four in regard to life narratives.

Comparing the Stability of Seven Most Important Memories and of Life Narratives

Next we tested whether the stability of life narratives exceeds that of most important memories (hypothesis five). Both kinds of stability correlated with each other across the younger cohorts r = .49 after two weeks, r = .40 after four years, r = .40 after eight years, and in the entire sample r = .48 after four years.

For the younger subsample, we ran another growth model, in which we compared the age-related development of stability of most important memories with that of life narratives. The best model (AIC = -247.9) included a fixed intercept (β = 0.48, t(506.8) = 16.8, p <.001) at age eight, a random age slope (β = 0.006, t(594.9) = 1.7, p > .05), a negative fixed slope for time interval (β = -0.35, t(595.3) = -10.4, p <.001), and an interaction of age with time interval (β = 0.01, t(559.7) = 3.5, p <.001). More importantly, the negative main effect for stability of life narratives versus that of memories (β = -0.17, t(485.3) = -4.1, p <.001) was attenuated by its interactions with age (β = 0.01, t(485.9) = 3.0, p <.01) and with time interval (β = 0.13, t(492.8) = 2.9, p <.01). Most important memories were more stable after 2 weeks, but life narratives were more stable after 4 and 8 years. Also with increasing age, life narratives became more stable than most important memories. At age 16, stability of life narratives began to surpass that of important memories (Figure 2).

To compare the stability of most important memories and of life narratives in the entire sample, we ran a rANOVA with age (6 levels) as between-subjects factor and stability of important memories vs. that of life narratives (2 levels) as within-subjects factor. Besides confirming the main effect of age (Pillai's F(5, 139) =10.14, p < .001, partial η^2 = .27), stability of life narratives (M = 0.55; SD = 0.22) clearly exceeded that of most important memories (M = 0.36; SD = 0.23; Pillai's F(1, 139) =100.39, p < .001, partial η^2 = .42) across four years.

In sum, hypothesis five was partly confirmed. After a brief time interval of only two weeks and at younger ages, most important memories were more stable than life narratives. After intervals of several years and after age 16, however, life narratives became more stable than important memories.

Discussion

The present study examined longitudinally the development of life story stability throughout the lifespan and how related factors such as normativity of life events and global text coherence contribute to a stable selection of events. Several findings contribute to the growing literature on narrative identity and merit further discussion. First, stability of important memories and life narratives decreases with time interval, but increases with age. Second, including normative life events enhances stability, because normative age-graded life events tend to be more stable than other life events. Third, causal-motivational coherence contributes to the stability of life narratives in the younger age range.

Effects of Time Interval on Life Story Stability

After merely two weeks, participants in the younger cohorts showed impressive stability in their nomination of seven most important memories (46% - 67%; Table 5) and, to a lesser degree, in their life narratives (33%-60%, Table 5). Stability after only two weeks should actually be seen more akin to retest-reliability than to stability of narrative identity, because it is

improbable that new biographically salient events happen or the self-concept undergoes changes within this brief time span.

Only at this very brief distance the seven most important memories were more stable than life narratives. This short-term advantage diminished with age as life narratives caught up at age 20. This initial difference reflects the absence of an elaborated life story in late childhood and early adolescence. If there is no life story schema, more volatile criteria of present importance and of remembering are probably stronger determinants of event selection than biographical salience, and remembering seven memories for two weeks is easier than remembering an entire life narrative. In terms of retest reliability, once there is a relatively developed life story at age 20, three fifths of the events in life narratives were repeated. Since narratives can be expected to vary with each telling to some degree, this may be seen as a moderate stability of the life story across various tellings at the same point in life. Once the life story is developed, short term life narrative stability did not differ from that of the seven most important memories. However, future research might explore stability of single event narratives and entire life narratives more independently from each other.

Rather consistently, the more time intervened between tellings, the more the content of important memories and life narratives changed. As time passes on, new life events need to be added. Furthermore, lower stability may be a result of reconstructive processes associated with individuals' changing perspectives on themselves and their lives. Therefore, life stories should exhibit both stability and change in order to provide individuals with a sense both of personal growth and of self-continuity. Indeed, if the events included in the repeated tellings of the life story remained perfectly stable over a long period of time, this would indicate an overly rigid and maladaptive narrative identity. Thus, exaggerated stability of narrative identity as a possible denial of ongoing change in life remains to be studied.

Effects of Age on Life Story Stability

Although personality researchers have explored patterns of stability and continuity in the stories people tell about their important life experiences (Bauer et al., 2014; Dunlop et al., 2016; Mackinnon et al., 2016; McAdams et al., 2006; Strauman, 1996; Thorne et al., 1998), the current study was the first large-scale longitudinal study to investigate more than two measurement times and compare important memories with complete life narratives. Growth modeling revealed that stability of most important memories depends on the interaction of age with time interval. With an increase of the time interval to four and eight years, stability of memories decreased steeply at younger ages and no longer showed a systematic increase with age. Throughout the last four-year time interval however, stability of most important memories increased between late adolescence and middle adulthood.

Stability of life narratives, in contrast, increased continuously with age from late childhood to late adulthood. The steepest increase occurred up to emerging adulthood, confirming Erikson's (1968) assumption that the endeavor to form identity and to develop a coherent and consistent story of one's life takes place in the second and third decades of life. The examples of Benjamin and Thomas exemplify these findings. At age 20 Benjamin told a good third of segments (36%) he had told four years earlier (in Table 2 we present 5 stable out of 21 segments), adding mostly new life events from the four years since the last telling (e.g., his backpacking tour in Australia; see also his seven most important memories, Table 2).

Thomas at age 44, in contrast, selected about 55% of the segments from the earlier life narrative and included fewer new life events in his life.

Whereas early adulthood is characterized by dramatic changes in life (Arnett, 2014), middle and older adulthood is characterized by long-term commitments to social, professional, and familial roles contributing to environmental stability as well as to the stabilization of personality and self-concept (Demo, 1992; Lucas & Donnellan, 2011). The stabilization of the self-concept then may translate into a more stable life story by mechanisms suggested by the Self Memory System theory (Conway et al., 2004), namely that autobiographical memories are selected according to their relevance for current goals and their consistency with the present view of oneself. On the other hand, life story theory argues that change in self and life can be integrated into the life story via autobiographical arguments, thereby constructing self-continuity across change (Habermas & Köber, 2015a). This should allow memories that over time have become inconsistent with present goals and self-concept to remain accessible.

That, however, raises the question why some of the formerly selected life events were not selected again, i.e. whether they were forgotten or excluded for other reasons. Admittedly, we asked for the same number of important events and allotted the same amount of time to narrate at each measurement time, and therefore do not know whether stability would have been higher or lower with the possibility to nominate more important memories and to take more time to narrate one's life. Our observations as well as other studies of stability (Mackinnon et al., 2016; McAdams et al., 2006; Thorne et al., 1998) point to the exclusion of life events that formerly had been considered highly self-relevant. Work on induced forgetting shows that autobiographical memories may become less accessible in free recall and in natural discussions (Stone, Barnier, Sutton, & Hirst, 2013). On the other hand, there is evidence that selected biographically salient facts (Bahrick, Bahrick, & Wittlinger, 1975) and events, such as earliest memories, are retained for very long time periods, so that the role of forgetting for life story instability is not clear. Future research needs to determine for which reasons life events are no longer nominated as important and no longer included in life narratives. Also, it would be interesting to test whether this exclusion leads to forgetting in the long run or whether people know that their life narrative has changed just as they know that their personality traits have changed (Robins, Noftle, Trzesniewski, & Roberts, 2005).

Another factor contributing to increasing life narrative stability with age may be the stabilization of identity. Erikson (1959) points to the identity tasks of adulthood to establish stability and to counterbalance it with the ongoing change in life as response to both tasks of *Identity versus Role Confusion* and *Integrity versus Despair.* Accordingly, emerging adults craft their narrative identity more in terms of change, whereas middle aged and older adults construct their narrative identity more in terms of stability (McLean, 2008). Further, Kroger (2015) characterized identity development in adulthood by increasing identity certainty and self-knowledge. The increasing stabilization of the life story up to middle adulthood found in this study may reflect one way to satisfy these identity tasks of adulthood. The need for self-knowledge and integrating the past is accomplished by sticking – at least in part – to the same elements of one's life story.

In addition, repeated telling may contribute to the stabilization of life narratives. We assume that events included in the life narratives have been told before and outside the interview situation, as people tend to disclose most of their experiences (Rimé, Finkenauer,

Luminet, Zech, & Philippot, 1998), especially if intense emotions are involved (Luminet, Bouts, Delie, Manstead, & Rimé, 2000). It has been argued that constructing links between events and other parts of life by embedding them in a life narrative through autobiographical reasoning establishes a skeletal memory representation of the life story, termed life story schema (Bluck & Habermas, 2000). Work on single event narratives supports the notion that autobiographical memories notably of older people are stored in a schematized way, leading to stable reproduction of the memory content with only little change, presumably maintaining a stable self-concept (Anderson, Cohen, & Taylor, 2000). Likewise, the life story schema will lead to more stability in retellings of the life story and consequently consolidate the self. People remember not only important events, but also the story of how they became the ones they are at present.

Effects of Normativity of Life Events on Life Story Stability

The increase of life story stability with age can partly be explained by the increasing inclusion of normative life events into the life story. Normative age-graded life events constitute prototypical temporal landmarks that mark transitions from one lifetime period to another and thus serve to organize autobiographical memories and to structure life stories (Bohn & Habermas, 2016; Brown et al., 2012; Enz & Talarico, 2016; Thomsen & Berntsen, 2005). This structural function of normative age-graded life events, however, requires the knowledge of a standard life course and of normative transitional events and their timing. This core of the cultural concept of biography is acquired in adolescence (Figure 1; cf. Bohn & Berntsen, 2008; Habermas, 2007). Correspondingly, the increasing inclusion of normative life events into life narratives contributed to life narrative stability above and beyond age in the younger subsample.

This stabilizing effect of the inclusion of normative life events was due to the greater stability of normative events compared to other life events. In terms of phenomenology, normative age-graded events are transitional events that are characterized by uniqueness, vividness, consequentiality, and emotional significance (Berntsen & Rubin, 2004; Svob, Brown, Reddon, Uzer, & Lee, 2013). Because many of them are socially expected to happen within a certain age span, they are anticipated over a longer time period, sometimes celebrated, and in the aftermath often shared and reminisced about in social settings. They therefore have a retrieval advantage (Maratos, Dolan, Morris, Henson, & Rugg, 2001; Pillemer, 1998), which may partly explain their greater stability in both important memories and life narratives throughout the entire study. However, other life events such as non-normative turning points are also central to life stories (Berntsen & Rubin, 2006; Grysman & Hudson, 2010) and they too are easily remembered (Enz & Talarico, 2016). Correspondingly, we found also other life events to show substantial stability throughout the lifespan (Figures 3 and 4). Altogether our results indicate that once knowledge about the normativity of life events is acquired, they serve to structure the life story and therefore remain stable ingredients in the life story.

Effects of Global Coherence and Especially Causal-Motivational Coherence on Life Narrative Stability

Although life story stability decreased with increasing time intervals, from age 16 onwards the decrease in stability was more dramatic in most important memories than in life

narratives as indicated by the lower time interval estimator (Tables 4 and 6). This finding points to important methodological concerns. Repeatedly assessed accounts of single important memories may be one method to critically test the longevity of the biographical salience of specific life events and to gain insights into the intra-individual stability or variability in narrative characteristics across different types of events (McLean, Pasupathi, Greenhoot, & Fivush, 2016). The repeatedly assessed complete life narratives, however, demonstrated the long-lasting biographical salience of life events throughout the life span.

As argued above, we suggest that global life narrative coherence renders complete life narratives more stable than the repeated selection of the same life events as most important memories. Notably, by age 16 the stability of life narratives clearly exceeded the stability of most important memories. This finding coincides with the development of global life narrative coherence in the same sample (Köber et al., 2015). From age 16 onwards, participants succeeded to coherently narrate their lives by presenting their individual personality development. In accordance, global coherence tended to predict life narrative stability above and beyond age mainly in the younger subsample, at the same time explaining part of the increase of stability with age. Apparently, once the life story format has been basically acquired and global life narrative coherence is mastered, life narratives start to become stable and exceed the stability of most important memories.

Considering the contribution of different aspects of global coherence to life narrative stability, our analyses revealed that causal-motivational coherence predicts stability above and beyond age in adolescence and young adulthood across several time intervals. Causal-motivational coherence helps to bridge and explain change in identity and life in order to develop a sense of personal continuity. Notably, the reflective process of autobiographical reasoning allows people to explain change in personality and life. It involves the use of autobiographical arguments and self-event-connections in order to link personal experiences and other distant parts of one's life to the self and its development (Habermas, 2011; Habermas & Köber, 2015a). Autobiographical reasoning develops up to early adulthood and contributes to causal-motivational coherence (Köber et al., 2015), which in turn, as the present study showed, contributes to the stability of life narratives in adolescents and emerging adults. They experience a great deal of change in relationships, residence, vocational and occupational roles, and consequently in their identity (Arnett, 2014). Apparently, if they can explain how life events motivated or caused actions and experiences and led to biographical consequences, the transformative life experiences are retained in the life story. This finding supports the theoretical claim that life events that prompt autobiographical reasoning are likely to become and to remain part of the life story, especially during the emergence of autobiographical identity in late adolescence and early adulthood (Bluck & Habermas, 2000; McLean, Pasupathi, & Pals, 2007; Pasupathi et al., 2007). In line with the argument that autobiographical reasoning provides a sense of meaning, unity, and purpose for the individual, our findings underscore how a causal-motivational integration into the life story creates a strong and stable connection between life experiences and the self.

Unexpectedly, for the second four-year time interval (2007–2011) across the six cohorts from age 16 to 69, global coherence did not significantly predict stability of life narratives, at least when corrected for age. Global temporal coherence predicted stability only in middle-aged and older adults. Global temporal coherence designates the orientation when an event

happened in life and is established by age 16 (Köber et al., 2015). The basic way to maintain temporal orientation is to imitate the sequence of events by following their linear chronological order, which was facilitated by our instruction asking the participants to recount their lives chronologically. The contribution of temporal coherence to the stability of life narratives in the adult cohorts might partly result from the more complex and much longer life these adults need to select from, organize, and compress into a 15-minutes narrative. This could render temporal organization more crucial than at younger ages.

Thematic coherence did not contribute to predicting stability in addition to causal-motivational and temporal coherence. Possibly thematic coherence may be maintained better across varying events than causal-motivational and temporal coherence, which follow a chronological logic. The finding by McAdams' and colleagues' (2006) that themes remained fairly stable across three years, despite the little stability of selected events, points in this direction. Thus future studies will need to identify particular themes and motives and their stability in life narratives. Global thematic coherence might better predict the stability of themes and motives than the stability of selected events in life narratives.

Among the limitations of this study is a relatively small sample size, which is due to the workload of transcribing, rating and coding verbal material. Also, life narratives were quite brief and more or less of the same length despite the vast differences in the length of lives. An alternative standardization might have been to adapt the length of narratives to the length of lives to be narrated, which however would have raised difficulties in comparing stability between different age groups. Additionally, stability across the entire sample could be tested only cross-sectionally because the older participants provided only two life narratives. These factors may have led to the failure to predict stability between 2007 and 2011 with coherence scores of 2007 across all age groups. Global coherence scores averaged for the first and second measurement (in 2003) may be more reliable scores than those measured at the third measurement time. The difference between the models predicting stability by global coherence at times one and two versus time three thus calls for a replication in later longitudinal measurements in this and other, bigger samples, and possibly in longer life stories.

Conclusion

To date narrative researchers have implicitly assumed that the life story is relatively stable. The present study strongly suggests that the selection of important memories as well as the inclusion of life events in the life narrative become more stable with age and, at younger ages, with increasing global coherence of life narratives. Furthermore, normative age-graded life events serve as a scaffold for life story stability. Altogether these findings provide substantial support for the idea that from mid-adolescence on the stability of the life story is an essential aspect of the stability of personality.

References

Allemand, M., Steiger, A. E., & Hill, P. L. (2013). Stability of personality traits in adulthood. *GeroPsych*, *26*, 5–13. http://doi.org/10.1024/1662-9647/a000080

Anderson, S. J., Cohen, G., & Taylor, S. (2000). Rewriting the past: some factors affecting the variability of personal memories. *Applied Cognitive Psychology*, *14*, 435–454. http://doi.org/10.1002/1099-0720(200009)14:5<435::AID-ACP662>3.0.CO;2-B

Arnett, J. J. (2014). *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties* (2nd ed.). New York, NY: Oxford University Press.

Bahrick, H. P., Bahrick, P. O., & Wittlinger, R. P. (1975). Fifty years of memory for names and faces: A cross-sectional approach. *Journal of Experimental Psychology: General*, *104*, 54–75. http://doi.org/10.1037/0096-3445.104.1.54

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, *67*. http://doi.org/10.18637/jss.v067.i01

Bates, D., Mächler, M., Bolker, B., Walker, S., Christensen, R. H. B., Singmann, H., & Dai, B. (2013). lme4: Linear mixed-effects models using Eigen and S4. *R Package Version 1.1-7*. Vienna, Austria. Retrieved from http://lme4.r-forge.r-project.org

Bauer, P. J., Tasdemir-Ozdes, A., & Larkina, M. (2014). Adults' reports of their earliest memories: consistency in events, ages, and narrative characteristics over time. *Consciousness and Cognition*, *27*, 76–88. http://doi.org/10.1016/j.concog.2014.04.008

Berntsen, D., & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory & Cognition*, *32*, 427–442. http://doi.org/10.3758/BF03195836

Berntsen, D., & Rubin, D. C. (2006). The centrality of event scale: A measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms. *Behaviour Research and Therapy*, *44*, 219–231. http://doi.org/10.1016/j.brat.2005.01.009

Bluck, S., & Habermas, T. (2000). The Life Story Schema. *Motivation and Emotion*, *24*, 121–147. http://doi.org/10.1023/A:1005615331901

Bohn, A., & Berntsen, D. (2008). Life story development in childhood: the development of life story abilities and the acquisition of cultural life scripts from late middle childhood to adolescence. *Developmental Psychology*, *44*, 1135–1147. http://doi.org/10.1037/0012-1649.44.4.1135

Bohn, A., & Habermas, T. (2016). Living in history and living by the cultural life script: How older Germans date their autobiographical memories. *Memory*, *24*, 482–495. http://doi.org/10.1080/09658211.2015.1019890

Brown, N. R., Hansen, T. G. B., Lee, P. J., Vanderveen, S. A., & Conrad, F. G. (2012). Historically defined autobiographical periods: Their origins and implications. In D. Berntsen & D. C. Rubin (Eds.), *Understanding autobiographical memory* (pp. 160–180). Cambridge, UK: Cambridge University Press. http://doi.org/10.1017/CBO9781139021937.013

Collins, K. A., Pillemer, D. B., Ivcevic, Z., & Gooze, R. A. (2007). Cultural scripts guide recall of intensely positive life events. *Memory & Cognition*, *35*, 651–659. http://doi.org/10.3758/BF03193303

Conway, M. A., Singer, J. A., & Tagini, A. (2004). The Self and Autobiographical Memory: Correspondence and Coherence. *Social Cognition*, *22*, 491–529. http://doi.org/10.1521/soco.22.5.491.50768

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, *11*, 671–684. http://doi.org/10.1016/S0022-5371(72)80001-X

De Silveira, C., & Habermas, T. (2011). Narrative means to manage responsibility in life narratives across adolescence. *The Journal of Genetic Psychology*, *172*, 1–20. http://doi.org/10.1080/00221325.2010.503254

Demo, D. H. (1992). The Self-Concept Over Time: Research Issues and Directions. *Annual Review of Sociology*, *18*, 303–326. http://doi.org/10.1146/annurev.soc.18.1.303

Demorest, A. P., & Alexander, I. E. (1992). Affective Scripts as Organizers of Personal Experience. *Journal of Personality*, *60*, 645–663. http://doi.org/10.1111/j.1467-6494.1992.tb00924.x

Dunlop, W. L., Guo, J., & McAdams, D. P. (2016). The Autobiographical Author Through Time: Examining the Degree of Stability and Change in Redemptive and Contaminated Personal Narratives. *Social Psychological and Personality Science*, *7*, 428–436. http://doi.org/10.1177/1948550616644654

Enz, K. F., & Talarico, J. M. (2016). Forks in the Road: Memories of Turning Points and Transitions. *Applied Cognitive*

Psychology, *30*, 188–195. http://doi.org/10.1002/acp.3176
Erikson, E. H. (1959). *Identity and the life cycle*. New York, NY: International Universities Press.
Erikson, E. H. (1968). *Identity : youth and crisis*. book, New York: Norton.
Grysman, A., & Hudson, J. A. (2010). Abstracting and extracting: causal coherence and the development of the life story. *Memory*, *18*, 565–80. http://doi.org/10.1080/09658211.2010.493890
Habermas, T. (2007). How to Tell a Life: The Development of the Cultural Concept of Biography. *Journal of Cognition and Development*, *8*, 1–31. http://doi.org/10.1080/15248370709336991
Habermas, T. (2011). Autobiographical reasoning: arguing and narrating from a biographical perspective. *New Directions for Child and Adolescent Development*, *131*, 1–17. http://doi.org/10.1002/cd.285
Habermas, T., & Bluck, S. (2000). Getting a life: the emergence of the life story in adolescence. *Psychological Bulletin*, *126*, 748–769. http://doi.org/10.10371/0033-2909.126.5.748
Habermas, T., & de Silveira, C. (2008). The development of global coherence in life narratives across adolescence: temporal, causal, and thematic aspects. *Developmental Psychology*, *44*, 707–721. http://doi.org/10.1037/0012-1649.44.3.707
Habermas, T., & Diel, V. (2013). The episodicity of verbal reports of personally significant autobiographical memories: vividness correlates with narrative text quality more than with detailedness or memory specificity. *Frontiers in Behavioral Neuroscience*, *7*, 110. http://doi.org/10.3389/fnbeh.2013.00110
Habermas, T., Diel, V., & Welzer, H. (2013). Lifespan trends of autobiographical remembering: episodicity and search for meaning. *Consciousness and Cognition*, *22*, 1061–73. http://doi.org/10.1016/j.concog.2013.07.010
Habermas, T., Ehlert-Lerche, S., & de Silveira, C. (2009). The development of the temporal macrostructure of life narratives across adolescence: beginnings, linear narrative form, and endings. *Journal of Personality*, *77*, 527–559. http://doi.org/10.1111/j.1467-6494.2008.00557.x
Habermas, T., & Köber, C. (2015a). Autobiographical Reasoning Is Constitutive for Narrative Identity. In K. C. McLean & M. Syed (Eds.), *The Oxford Handbook of Identity Development* (pp. 149–165). Oxford, UK: Oxford University Press. http://doi.org/10.1093/oxfordhb/9780199936564.013.010
Habermas, T., & Köber, C. (2015b). Autobiographical reasoning in life narratives buffers the effect of biographical disruptions on the sense of self-continuity. *Memory*, *23*, 664–674. http://doi.org/10.1080/09658211.2014.920885
Hatiboğlu, N., & Habermas, T. (2016). The normativity of life scripts and its relation with life story events across cultures and subcultures. *Memory*, *24*, 1369–1381. http://doi.org/10.1080/09658211.2015.1111389
Josselson, R. (2000). Stability and change in early memories over 22 years: themes, variations, and cadenzas. *Bulletin of the Menninger Clinic*, *64*, 462–481.
Josselson, R. (2009). The present of the past: dialogues with memory over time. *Journal of Personality*, *77*, 647–668. http://doi.org/10.1111/j.1467-6494.2009.00560.x
Köber, C., & Habermas, T. (2017). Development of Temporal Macrostructure in Life Narratives Across the Lifespan. *Discourse Processes, 54,* 143-162. 10.1080/0163853X.2015.1105619
Köber, C., Schmiedek, F., & Habermas, T. (2015). Characterizing Lifespan Development of Three Aspects of Coherence in Life Narratives : A Cohort-Sequential Study. *Developmental Psychology*, *51*, 260–275. http://doi.org/10.1037/a0038668
Kroger, J. (2015). Identity Development Through Adulthood. In K. C. McLean & M. Syed (Eds.), *The Oxford Handbook of Identity Development* (pp. 65–80). Oxford, UK: Oxford University Press. http://doi.org/10.1093/oxfordhb/9780199936564.013.004
Lehman, S., & Schraw, G. (2002). Effects of coherence and relevance on shallow and deep text processing. *Journal of Educational Psychology*, *94*, 738–750. http://doi.org/10.1037//0022-0663.94.4.738
Lejeune, P. (1986). *Moi aussi [Me too]*. Paris, France: Seuil.
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*, 391–428. http://doi.org/10.1111/j.1467-6494.2010.00688.x
Lodi-Smith, J., Geise, A. C., Roberts, B. W., & Robins, R. W. (2009). Narrating personality change. *Journal of Personality and Social Psychology*, *96*, 679–689. http://doi.org/10.1037/a0014611
Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, *101*, 847–861. http://doi.org/10.1037/a0024298

Luminet, O., Bouts, P., Delie, F., Manstead, A. S. R., & Rimé, B. (2000). Social sharing of emotion following exposure to a negatively valenced situation. *Cognition and Emotion*, *14*, 661–688. http://doi.org/10.1080/026999300501176666

Mackinnon, S. P., De Pasquale, D., & Pratt, M. W. (2016). Predicting Generative Concern in Young Adulthood from Narrative Intimacy: A 5-Year Follow-Up. *Journal of Adult Development*, *23*, 27–35. http://doi.org/10.1007/s10804-015-9218-1

Mar, R. A. (2004). The neuropsychology of narrative: Story comprehension, story production and their interrelation. *Neuropsychologia*, *42*, 1414–1434. http://doi.org/10.1016/j.neuropsychologia.2003.12.016

Maratos, E. J., Dolan, R. J., Morris, J. S., Henson, R. N. A., & Rugg, M. D. (2001). Neural activity associated with episodic memory for emotional context. *Neuropsychologia*, *39*, 910–920. http://doi.org/10.1016/S0028-3932(01)00025-2

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

McAdams, D. P. (2013). The Psychological Self as Actor, Agent, and Author. *Perspectives on Psychological Science*, *8*, 272–295. http://doi.org/10.1177/1745691612464657

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*, 761–784. http://doi.org/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., … 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. http://doi.org/10.1111/j.1467-6494.2006.00412.x

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

McLean, K. C., Pasupathi, M., Greenhoot, A. F., & Fivush, R. (2016). Does intra-individual variability in narration matter and for what? *Journal of Research in Personality*. Advance online publication. http://doi.org/10.1016/j.jrp.2016.04.003

McLean, K. C., Pasupathi, M., & Pals, J. L. (2007). Selves creating stories creating selves: a process model of self-development. *Personality and Social Psychology Review*, *11*, 262–278. http://doi.org/10.1177/1088868307301034

McLean, K. C., & Pratt, M. W. (2006). Life's little (and big) lessons: identity statuses and meaning-making in the turning point narratives of emerging adults. *Developmental Psychology*, *42*, 714–722. http://doi.org/10.1037/0012-1649.42.4.714

Negele, A., & Habermas, T. (2010). Self-Continuity Across Developmental Change in and of Repeated Life Narratives. In K. C. McLean & M. Pasupathi (Eds.), *Narrative development in adolescence* (pp. 1–22). Boston, MA: Springer. http://doi.org/10.1007/978-0-387-89825-4

Pasupathi, M., Mansour, E., & Brubaker, J. R. (2007). Developing a Life Story: Constructing Relations between Self and Experience in Autobiographical Narratives. *Human Development*, *50*, 85–110. http://doi.org/10.1159/000100939

Peterson, C., & McCabe, A. (1983). *Developmental psycholinguistics : 3 ways of looking at child's narrative*. book, New York, NY: Plenum Press.

Peterson, C., Morris, G., Baker-Ward, L., & Flynn, S. (2014). Predicting which childhood memories persist: Contributions of memory characteristics. *Developmental Psychology*, *50*, 439–448. http://doi.org/10.1037/a0033221

Pillemer, D. B. (1998). *Momentous events, vivid memories: How unforgettable moments help us understand the meaning of our lives*. Cambridge, MA: Harvard University Press.

Radvansky, G. A., Copeland, D. E., & Zwaan, R. A. (2005). A novel study: investigating the structure of narrative and autobiographical memories. *Memory*, *13*, 796–814. http://doi.org/10.1080/09658210444000412

Raggatt, P. (2006). Putting the five-factor model into context: evidence linking big five traits to narrative identity. *Journal of Personality*, *74*, 1321–1348. http://doi.org/10.1111/j.1467-6494.2006.00411.x

Rantanen, J., Metsäpelto, R.-L., Feldt, T., Pulkkinen, L., & Kokko, K. (2007). Long-term stability in the Big Five personality traits in adulthood. *Scandinavian Journal of Psychology*, *48*, 511–518. http://doi.org/10.1111/j.1467-9450.2007.00609.x

Ricœur, P. (1991). Narrative Identity. *Philosophy Today*, *35*, 73–81. http://doi.org/ 10.5840/philtoday199135136

Rimé, B., Finkenauer, C., Luminet, O., Zech, E., & Philippot, P. (1998). Social Sharing of Emotion: New Evidence and New Questions. *European Review of Social Psychology*, *9*, 145–189. http://doi.org/10.1080/14792779843000072

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*, 1–25. http://doi.org/10.1037/0033-2909.132.1.1

Robins, R. W., Noftle, E. E., Trzesniewski, K. H., & Roberts, B. W. (2005). Do people know how their personality has changed? Correlates of perceived and actual personality change in young adulthood. *Journal of Personality*, *73*, 489–521. http://doi.org/10.1111/j.1467-6494.2005.00317.x

Rubin, D. C. (1995). *Memory in oral traditions: The cognitive psychology of epic, ballads, and counting-out rhymes*. New York, NY: Oxford University Press.

Rubin, D. C., Berntsen, D., & Hutson, M. (2009). The normative and the personal life: individual differences in life scripts and life story events among USA and Danish undergraduates. *Memory*, *17*, 54–68. http://doi.org/10.1080/09658210802541442

Schank, R. C., & Abelson, R. P. (1995). Knowledge and memory: The real story. In R. S. Wyer Jr (Ed.), *Knowledge and memory: The real story. Advances in social cognition* (Vol. III, pp. 1–85). New Jersey, NY: Psychology Press.

Singer, J. A., & Salovey, P. (1993). *The remembered self*. New York, NY: Free Press.

Stone, C. B., Barnier, A. J., Sutton, J., & Hirst, W. (2013). Forgetting our personal past: socially shared retrieval-induced forgetting of autobiographical memories. *Journal of Experimental Psychology: General*, *142*, 1084–1099. http://doi.org/10.1037/a0030739

Strauman, T. J. (1996). Stability within the self: a longitudinal study of the structural implications of self-discrepancy theory. *Journal of Personality and Social Psychology*, *71*, 1142–1153. http://doi.org/10.1037/0022-3514.71.6.1142

Svob, C., Brown, N. R., Reddon, J. R., Uzer, T., & Lee, P. J. (2013). The transitional impact scale: Assessing the material and psychological impact of life transitions. *Behavior Research Methods*, 448–455. http://doi.org/10.3758/s13428-013-0378-2

Thomsen, D. K. (2015). Autobiographical Periods : A Review and Central Components of a Theory. *Review of General Psychology*, 1–17. http://doi.org/10.1037/gpr0000043

Thomsen, D. K., & Berntsen, D. (2005). The end point effect in autobiographical memory: more than a calendar is needed. *Memory*, *13*, 846–861. http://doi.org/10.1080/09658210444000449

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*, 260–277. http://doi.org/10.1080/02699931.2013.815155

Thorne, A., Cutting, L., & Skaw, D. (1998). Young Adults' Relationship Memories and the Life Story: Examples or Essential Landmark? *Narrative Development in Adolescence*, *8*, 237–268. http://doi.org/10.1075/ni.8.2.02tho

Tomkins, S. S. (1987). Script theory. In J. Aronoff, A. I. Rabin, & R. A. Zucker (Eds.), *The emergence of personality* (pp. 147–216). New York, NY: Springer.

Williams, H. L., & Conway, M. A. (2009). Networks of autobiographical memories. In P. Boyer & J. V. Wertsch (Eds.), *Memory in mind and culture* (pp. 33–61). New York, NY: Cambridge University Press.

Wortman, J., Lucas, R. E., & Donnellan, M. B. (2012). Stability and Change in the Big Five Personality Domains: Evidence From a Longitudinal Study of Australians. *Psychology and Aging*, *27*, 867–874. http://doi.org/10.1037/a0029322

Table 1

Age (Mean, Standard Deviation) and Number of Participants by Cohort for Each Measurement Time and Initial Gender Distribution

Year	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Cohort 5	Cohort 6	N
2003	8.63 *(0.23)*	12.46 *(0.34)*	16.56 *(0.41)*	20.51 *(0.53)*			113
2007	12.90 *(0.52)*	16.58 *(0.42)*	20.70 *(0.51)*	24.93 *(0.73)*	41.44 *(2.99)*	65.23 *(2.66)*	155
2011	17.03 *(0.48)*	20.58 *(0.39)*	24.61 *(0.41)*	28.90 *(0.67)*	45.08 *(3.02)*	68.73 *(2.65)*	150
N	in 2003				in 2007		
Male	14	13	15	13	11	14	80
Female	13	17	13	15	11	15	84

Table 3

Time Intervals of Stability Assessment for Most Important Memories and Life Narratives

Compared Measurement Times	Resulting Intervals	Included Cohorts	N
T1 (2003) vs. T2 (2003)	2-week interval	Cohort 1 to 4	105
T1/T2 (2003) vs. T3 (2007)	4-year interval	Cohort 1 to 4	104
T3 (2007) vs. T4 (2011)	4-year interval	Cohort 1 to 6	150
T1/T2 (2003) vs. T4 (2011)	8-year interval	Cohort 1 to 4	99

Table 4

Growth Model for Age- and Time Interval-Related Linear Trends of the Stability of Seven Most Important Memories in the Younger Subsample, ages 8 to 28.

	Growth Model of Seven Most Important Memories		
	Estimator	*SE*	*t(df)*
Fixed Effects			
Intercept	0.489*	0.034	14.14 (112.6)
Age	0.005	0.004	1.23 (201.3)
Time Interval	-0.335*	0.037	-9.03 (220.7)
Age x Time Interval	0.009*	0.003	2.89 (199.1)
	Variance	*SD*	
Random Effects			
Intercept	3.203*	5.660	
Age	4.384	6.621	
Residual	4.507	2.123	
Model fit			
Deviance		-57.1	

Note. Random effects, if present, were tested sequentially with $\Delta\chi^2$ tests (*df* = 1) based on model deviance (-2Log-Likelihood), that is, it was tested whether the effect was significant when entered in addition to all effects above it.
*p < .05.

Table 5

Mean percentage of stable most important memories and stable segments of life narratives, not corrected for age.

Age at subsequent measurement	Stability of most important memories after …			
	Two Weeks	Four Years	Four Years	Eight Years
8	46.12			
12	50.89	5.86		
16	67.23	16.41	16.38	3.45
20	64.65	10.79	24.88	16.88
24		21.60	28.56	10.12
28			33.82	20.69
44			35.50	
69			44.90	

Age at subsequent measurement	Stability of life narratives after …			
	Two Weeks	Four Years	Four Years	Eight Years
8	33.25			
12	38.94	11.75		
16	49.01	23.94	27.04	8.72
20	60.30	31.01	33.64	20.44
24		40.41	40.95	24.00
28			58.36	39.46
44			59.72	
69			63.30	

Table 6

Mixed Models for Linear Trends of the Stability of Life Narratives Related to Age, Time-Interval, Normativity of Life Events, and Global Text Coherence in the Younger Subsample, ages 8 to 28.

	Growth Model of Life Narratives									
				with Frequency of Normative Life events			with Global Coherence			
	Estimator	*SE*	*t (df)*	Estimator	*SE*	*t (df)*	Estimator	*SE*	*t(df)*	$\Delta\chi^2$
Fixed Effects										
Intercept	0.317*	0.028	11.56 (71.2)	0.287*	0.032	8.94 (111.5)	0.246*	0.034	7.17 (129.7)	
Age	0.020*	0.003	5.68 (140.8)	0.018*	0.004	4.91 (153.9)	0.008*	0.005	1.72 (174.9)	
Time Interval	-0.199*	0.026	-7.52 (254.9)	-0.208*	0.026	-8.13 (265.7)	-0.170*	0.027	-6.23 (272.6)	
Age x Time Interval	0.005*	0.002	2.56 (218.4)	0.006*	0.002	3.38 (219.4)	0.007*	0.002	3.04 (217.2)	
Frequency of normative life events				0.260*	0.113	2.31 (103.5)	0.284*	0.108	2.64 (101.8)	4.90*
Causal-motivational coherence							0.038*	0.012	3.20 (133.2)	9.26*
	Variance	*SD*		Variance	*SD*		Variance	*SD*		
Random Effects										
Intercept	0.018*	0.134		0.020*	0.140		0.020*	0.140		
Age	0.001*	0.015		0.001*	0.016		0.001*	0.016		
Residual	0.015	0.124		0.013	0.114		0.013	0.115		
Model fit										
Deviance		-222.8			-267.0			-276.3		

Note. Random effects, if present, were tested sequentially with $\Delta\chi^2$ tests ($df = 1$) based on model deviance (-2Log-Likelihood), that is, it was tested whether the effect was significant when entered in addition to all effects above it. *p < .05.

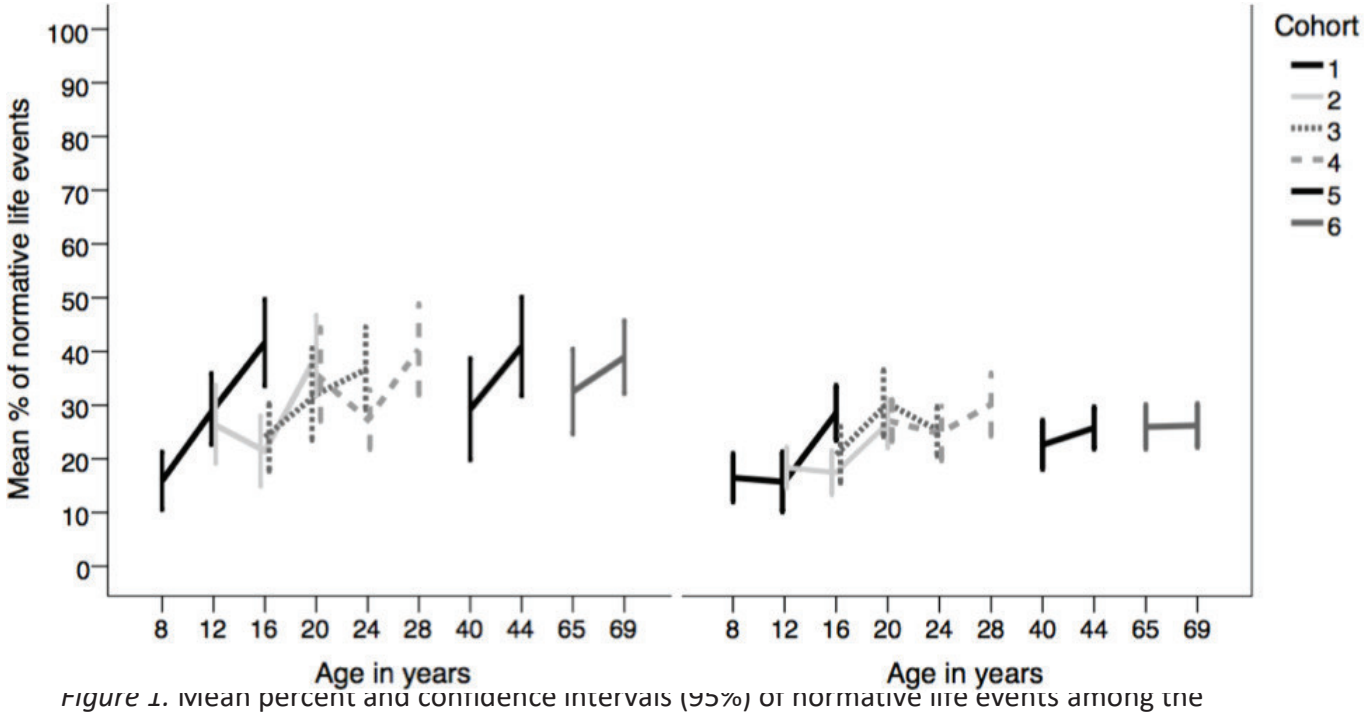

Figure 1. Mean percent and confidence intervals (95%) of normative life events among the seven of most important memories (left) and among segments of entire life narratives (right) by age.

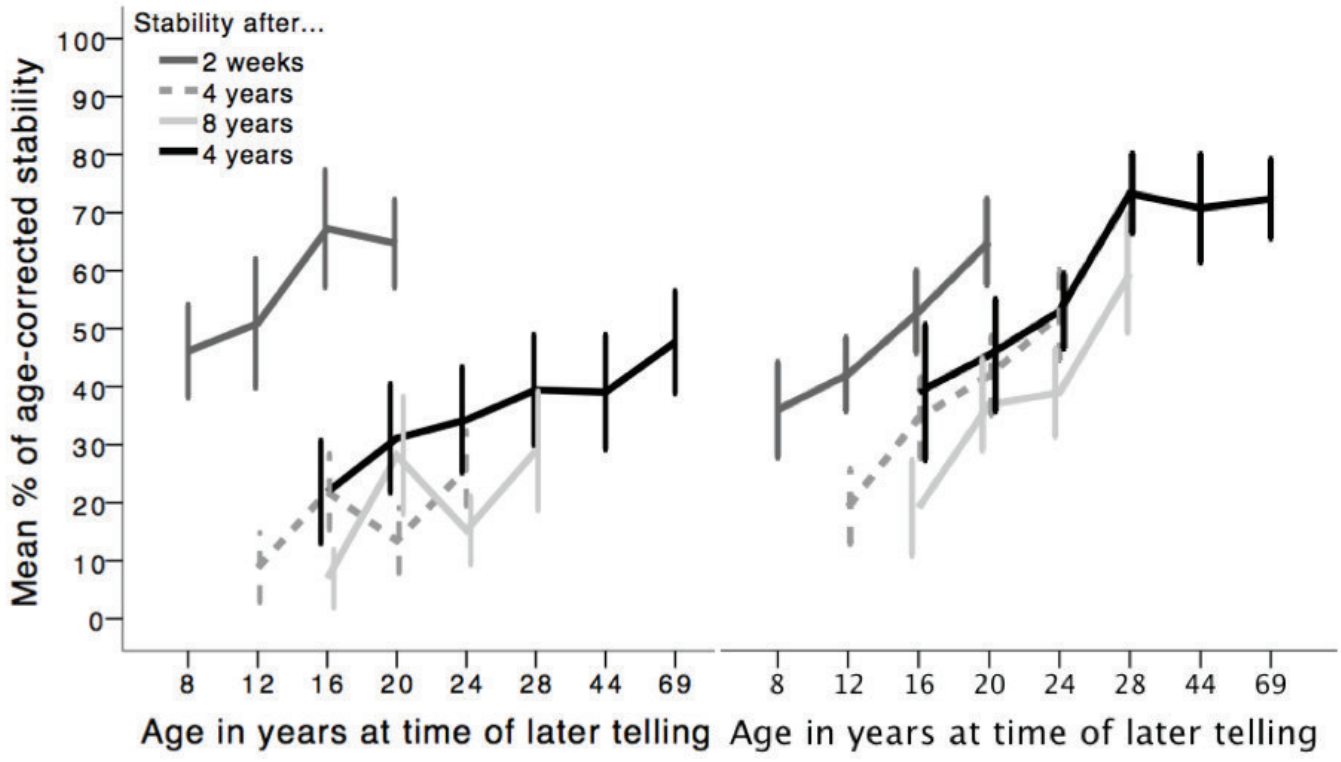

Figure 2. Mean percent and confidence intervals (95%) of age-corrected stability of seven of most important memories (left) and of entire life narratives (right) by age and time interval.

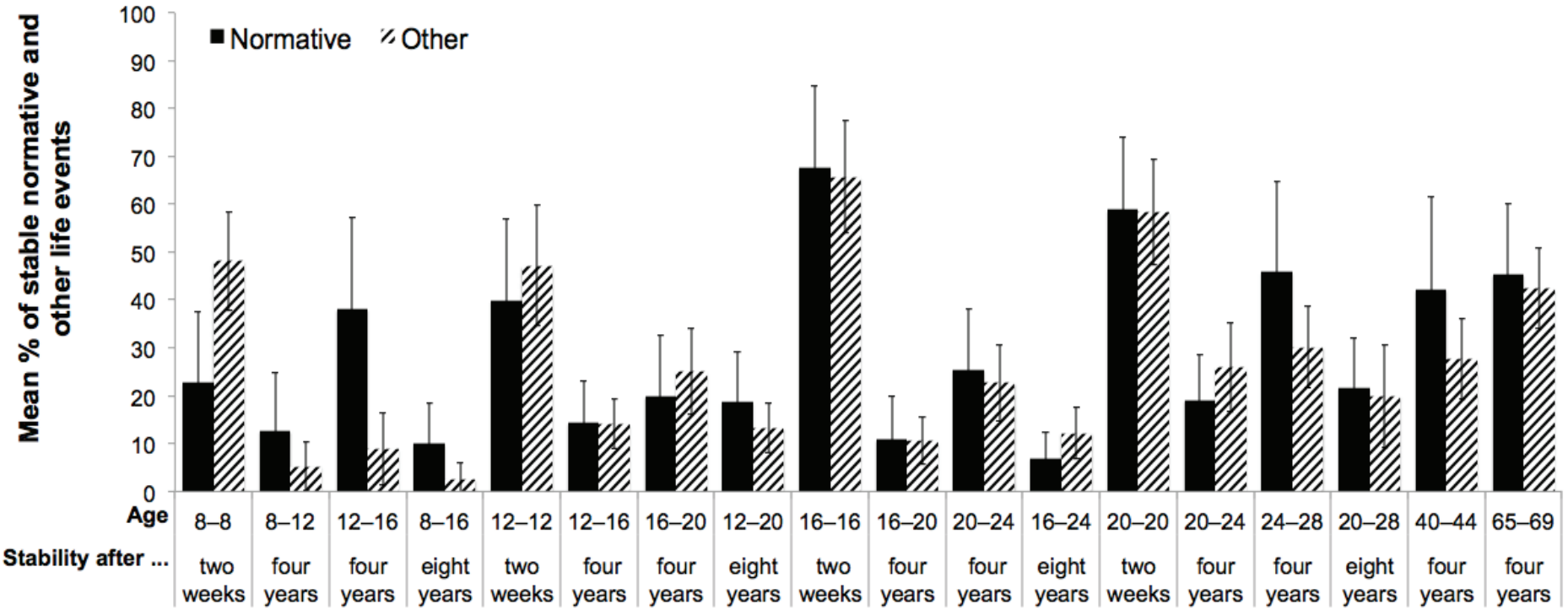

Figure 3. Mean percentage and confidence intervals (95%) of normative and other most important memories written on index cards that were stable, not corrected for age, by age and time interval.

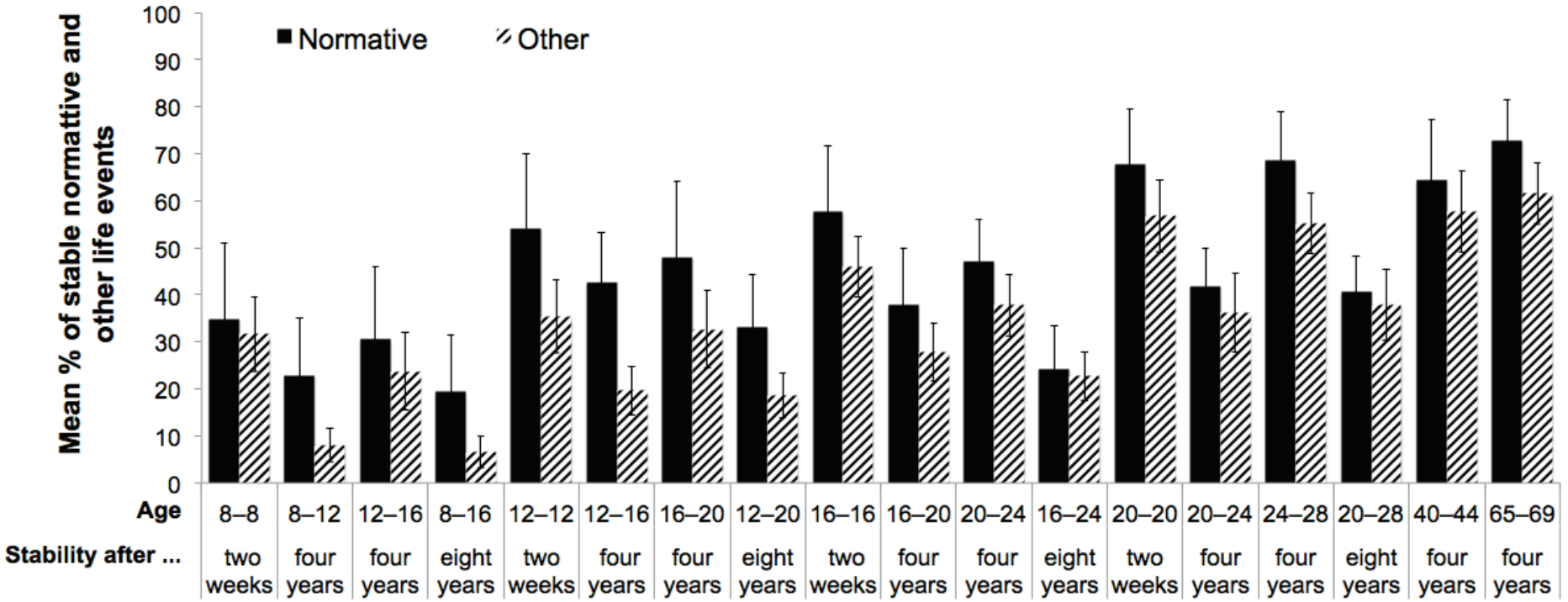

Figure 4. Mean percentage and confidence intervals (95%) of life narrative segments containing normative and other life events that were stable, not corrected for age, by age and time interval.

Appendix

This paper is part of a series that probes a data set involving the longitudinal collection of life narratives over an eight-year period in order to study how the telling of a life narrative develops over the life span. Other publications using data from the three-wave longitudinal data set analyzing them in very different ways are the following articles:

Habermas, T., & Köber, C. (2015). Autobiographical reasoning in life narratives buffers the effect of biographical disruptions on the sense of self-continuity. *Memory, 23*, 664–674. doi:10.1080/09658211.2014.920885

Köber, C., & Habermas, T. (2016). Development of temporal macrostructure in life narratives across the Lifespan. *Discourse Processes, 54,* 143-162. Doi: 10.1080/0163853X.2015.1105619

Köber, C., Schmiedek, F., & Habermas, T. (2015). Characterizing lifespan development of three aspects of coherence in life narratives : A cohort sequential study. *Developmental Psychology, 51*, 260–275. doi:10.1037/a0038668

Papers based on the first and parts of the second wave are:

De Silveira, C., & Habermas, T. (2011). Narrative means to manage responsibility in life narratives across adolescence. *The Journal of Genetic Psychology, 172*, 1–20. doi:10.1080/00221325.2010.503254

Habermas, T. (2007). How to Tell a Life: The development of the cultural concept of biography. *Journal of Cognition and Development, 8,* 1–31. doi:10.1080/15248370709336991

Habermas, T., & de Silveira, C. (2008). The development of global coherence in life narratives across adolescence: temporal, causal, and thematic aspects. *Developmental Psychology, 44*, 707–721. doi:10.1037/0012-1649.44.3.707

Habermas, T., & Diel, V. (2013). The episodicity of verbal reports of personally significant autobiographical memories: Vividness correlates with narrative text quality more than with detailedness or memory specificity. *Frontiers in Behavioral Neuroscience, 7*, 110. doi:10.3389/fnbeh.2013.00110

Habermas, T., Diel, V., & Welzer, H. (2013). Lifespan trends of autobiographical remembering: Episodicity and search for meaning. *Consciousness and Cognition, 22*, 1061–73. doi:10.1016/j.concog.2013.07.010

Habermas, T., Ehlert-Lerche, S., & de Silveira, C. (2009). The development of the temporal macrostructure of life narratives across adolescence: beginnings, linear narrative form, and endings. *Journal of Personality, 77*, 527–559. doi:10.1111/j.1467-6494.2008.00557.x