

Getting a life takes time: The development of the life story in adolescence, its precursors and consequences

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Abstract

The life story is a special cognitive-communicative format which allows understanding persons from a biographical perspective through autobiographical reasoning and life narrating. Reviewing research on the development of the life story from the past 15 years, we clarify the conceptual and developmental specificity of the life story by comparing it to single event stories, and the specificity of autobiographical reasoning by comparing it to other forms of reasoning. To support the claim that the life story emerges only in adolescence, we review the earlier development of self and autobiographical remembering leading up to the life story. We outline the significance of autobiographical reasoning for bridging biographical ruptures, and we discuss the meaning of the cultural context for the development of the life story and its functionality. Finally, we suggest major developmental research questions that remain to be pursued.

Early psychologists, such as Karl Philipp Moritz and Sigmund Freud, valued autobiography and biography to study the lives of individuals. In everyday life, biography and autobiography are of interest not only as literary genres, but also in the popular media. Writing one's autobiography is so popular that commercial services offer to help.

Psychology's interest in the biographical format as an object of research, in contrast to biography as a scientific method, is fairly recent. The interest in individuals' subjective life stories came out of the life story as a method for psychotherapy (Freud, 1905) and for research in personality psychology (Allport, 1942; Murray, 1938). Erik Erikson drew on these traditions both for writing the psychobiographies of Luther (1958) and Gandhi (1970), and for conceptualizing the development of psychosocial identity, especially in adolescence.

Only with the narrative turn in the 1980s did the subjective life story become a topic in psychology. Schafer (1983) interpreted psychoanalytic therapy as a repair of the subjective life story, while Bruner (1987) attributed a storied nature to life itself. Two Harvard-trained psychologists transferred to Chicago, however, introduced the subjective life story as a narrative into psychology. Bertram Cohler suggested in a programmatic essay (1982) that the personal narrative of one's life is the means by which identity integration over time is maintained, being re-constructed as life is being lived. Cohler spelled out what had remained somewhat implicit in Erikson - namely that adolescent cognitive development allowed constructing a life story (cf. Schiff, 2014). Dan McAdams (1985) proposed a highly elaborate personological model of the architecture of subjective life stories, including motives as thematic lines, repetitive nuclear episodes, characters, and ideological settings, from which he developed a rich research program in personality psychology (cf. McAdams & Zapata-Gietl, 2015).

The life story offers four major advantages compared to social-psychological (Turner, 1975) and sociological (Goffman, 1963) concepts of personal and social identity, which are defined in terms of membership in groups and combinations of these, as well as compared to a concept of personality defined by stable traits in personality psychology. These advantages derive from the specific integrative power of narrative. Identity requires an integrative effort of synthesizing the various aspects of the individual into a more or less coherent self (Fournier et al., 2015; James, 1895). First, the life story is foremost a format that allows the creation of self-continuity across biographical change. As McAdams and Zapata-Gietl (2015, p. 85) point out, a sense of identity across time may be based on a stable self-description in terms of personality traits as well as roles and group memberships. When traits or roles change, however, this sense of self-sameness weakens. It is in these specific circumstances of biographical change that the life story may compensate the sense of identity disruption, bridging biographical change by integrating them in a narrative and allowing motivated transitions by way of autobiographical arguments (Habermas & Köber, 2015a, b). This process is specifically what Ricoeur (1990) termed narrative identity in contrast to identity as self-sameness across time. Secondly, the life story may also facilitate the other integrative task of identity – that of integrating various synchronic aspects of the individual across situations and social contexts. The life story provides the possibility of narrating how different aspects may harmonize with each other, or of explaining how they harmonize by telling about the personal experiences in which they are rooted. Thirdly, the life story may best fulfill another requirement of identity, that of demonstrating the person's individuality. Although personal identity conceived as a unique combination of social identities, or as a combination of numerical values on several personality dimensions, does allow differentiating one person from another in an economic way, social roles and traits do not define each person as unique (McAdams, 2001). The life story, in contrast, offers a highly individualized version of identity. Finally, the life story not only allows one to explicate the objective aspects of identity, but also implicitly expresses the subjective sense of identity, "a subjective sense of an invigorating sameness and continuity" (Erikson, 1968, p. 19). Therefore, life narratives can be used for the purpose of diagnosing identity integration in clinical contexts (Kernberg, 1984).

The life story thus offers a clear advantage when it comes to identity integration and individuality, although social identities and personality traits are highly relevant and useful formats of identity in many contexts. The dominant empirical approach to the development of psychosocial identity is based on Marcia's (1966) theory of identity status. Marcia's theory categorizes individuals on the basis of how committed they are to values and whether they have undergone a phase of actively exploring these values. The approach uses interviews or questionnaires and tends to focus on individual differences; its developmental assumptions have not borne out so clearly (Crocetti & Meeus, 2015; Josselson & Flum, 2015). Whereas identity status is about a specific aspect of identity - the identification with values - the life story is a format of identity that encompasses all possible prescriptive and descriptive aspects that can be explicated and located in autobiography. Thinking about one's past life story (autobiographical reasoning, see below) is one way of exploring one's identity (McLean & Pasupathi, 2012). Life narratives should also allow an assessment of identity status, although researchers have not yet attempted this. We would expect individuals with an achieved identity, who have undergone a phase of active identity exploration, to provide more anchoring of their values and personality traits in personal experiences.

Up to 15 years ago, theorists had not yet systematically pursued the development of the subjective conception of human lives and of thinking in biographical terms (but cf. Feldman, Bruner, Kalmar & Renderer, 1993). In 2000 Susan Bluck and I (Habermas & Bluck, 2000) drew together what was known about adolescent development to suggest which motivational and cognitive preconditions are necessary to construct a subjective life story, explaining why we thought it did not emerge before adolescence.

Our initial review generated a wealth of findings in memory, personality, and developmental psychology. Researchers gathered systematic evidence to test the emergence of the life story in adolescence, and we also know much more now about the life story's childhood precursors in the field of autobiographical remembering. This blossoming of research has brought about a differentiation in measures used and aspects of the life story studied. In this paper we address three aspects of the field that we feel need to be critically assessed at this point. First, the broadening of the field and proliferation of measures has had the side-effect of broadening and sometimes even blurring of theoretical concepts and terminology. Dunlop and Walker (2013, p. 5), for instance, broadened their use of the term life story to include any "phenomenological representation of the past, present, and future", thereby drastically blurring the conceptual boundaries. Second, the lower developmental boundary of the life story and its relation to developmental precursors have not been defined and studied clearly. In certain respects this is due to a lack of conceptual clarity, such as when Dunlop and Walker (2013) declared that some forms of the life story develop in childhood; in other respects, the typical quantitative reporting of results may obscure qualitative differences. Third, functional demand characteristics of cultures may motivate individuals to develop the life story to a greater or lesser degree. Functional consequences of the use of the life story, in terms of well-being or related constructs, also merit increased attention as the basic developmental sequence of life story acquisition becomes better established.

To address these issues, we first define the theoretical elements of the life story with respect to entire life narratives and life story coherence, and the many forms of autobiographical reasoning. Then we critically review the empirical evidence regarding the relation between self and memory before and after the acquisition of the life story, then regarding representations of the entire life, and finally regarding the autobiographical interpretation of specific events. In the last two sections we discuss the development of the functional consequences of the life story for well-being, and the relevance of the subjective life story across cultures in relation to a good life.

The life story and autobiographical reasoning: Their qualitative distinctness in development

Figure 1 illustrates the relations among the major concepts of life story theory. Habermas and Bluck (2000) defined the life story as a theoretical concept and as one possible form of identity, which offers

the most abstract and integrative level of the autobiographical knowledge base (Conway, Singer & Tagini, 2004). We hypothesized that there is a mnemonic representation of the life story, termed the *life story schema* (Bluck & Habermas, 2000). Whereas the life story schema is a hypothetical construct, entire life narratives and autobiographical arguments are empirical phenomena. The life story is most completely manifested in entire *life narratives* as specific, but rare linguistic products. A more frequent, but only partial manifestation of the life story, is *autobiographical arguments*. The activity of using autobiographical arguments in thinking, speaking, and writing is termed *autobiographical reasoning*. Autobiographical arguments create links between personal experiences and other distant parts of one's life, and to the self and its development (Habermas, 2011). The life story schema results from the active first-time construction of life story coherence in life story telling and, in turn, is used when telling a life and when reasoning autobiographically.

Life narratives may be divided into partially overlapping chapters, which in turn are segmented into three major types of text: namely *single event narratives* (e.g., my eighth birthday), *chronicles* which list events or summarize extended time periods (e.g., one's time at high school), and *arguments* (e.g., reflections about the quality of the relationship to one's parents; see Figure 1). A life narrative cannot consist solely of single event narratives. Chronicles need to summarize the extended time periods in which specific events are embedded. Arguments sometimes constitute a separate segment of text, often at the end of life narratives, when the narrator evaluates the life as a whole, or discusses a specific concern (e.g., the development of the relationship to mother). Narrators may use autobiographical arguments in single event narratives both as part of entire life narratives, contributing to their global coherence, and in free-standing single event narratives. Narrators may also use arguments outside a narrative context, such as in research interviews or self-reflections. For example, one may be wondering about current difficulties with a parent, and look for reasons in one's biography, without actually narrating current difficulties. In Figure 1, the dashed lines exemplify the links created by autobiographical arguments between distant parts of life and between life events and the self.

The life story is a highly distinct format. Following Cohler (1982), McAdams (1985), and Ricoeur (1990), and in concordance with everyday usage of the word, we use the term life story for a representation of an individual life with the quality of a narrative (temporal succession, evaluation - Labov & Waletzky, 1967). Therefore the qualities of the life story can best be defined with reference to an entire, globally coherent life narrative. A life narrative is thus more than a list of events which neither narrates each event nor relates them to each other. A life narrative is also more than a list of events that are locally coherent in themselves, but disconnected single event narratives from a life. Such event narratives are *discoherent* (Linde, 1993) among each other, so that there is no global life narrative coherence. Note that a lack of coherence, termed *discoherence*, is different from *incoherence*, which stresses not only the lack of coherence, but also, at a semantic level, the contradictoriness of statements, or, at a pragmatic level, the contradictoriness of a statement and an action.

On the one hand, a life narrative is by far more complex and comprehensive than a single event narrative (e.g., Labov, 2013; Stein & Glenn, 1979) told in everyday life. On the other hand, its structure is less clear-cut and less normative. A life narrative is not necessarily built around a complicating event and attempts to solve it, i.e. it does not require a unitary plotline.

Therefore, Habermas and Bluck (2000) suggested different aspects of the overall global coherence of life narratives. The most important aspects we suggested were *temporal* global coherence, allowing the listener to place the events told in the life, *causal-motivational* global coherence, allowing the listener to understand the personal development of the narrator as it was influenced by the contiguities of life as well as by the main aims and values guiding the individual's attempt to lead a good life, and, finally, *thematic* global coherence, created by dominant motives and nuclear episodes which tend to characterize the entire life and define the narrator's individuality. Whereas thematic global coherence is created by finding themes underlying heterogeneous events across life, stressing a pervasive individual

theme, causal-motivational global coherence is created by rendering change and development of the protagonist plausible. Thematic coherence stresses constancy, and causal-motivational coherence creates continuity (not sameness!) across change and development (Habermas & Köber, 2015a, b).

An example from our corpus of how causal-motivational coherence may be created is 20 year-old Dorian's explanation for why he wants to become a carpenter. In his life narrative he mentions that he lived in the Amazonas area with his parents for four years as an early adolescent. He felt indebted to the hospitality he had received, obliged to help people there, and wished to return to the place where he had spent the happiest time of his life. He reasoned that the skills of a carpenter would enable him to be of use when returning to that area. The most extreme example of thematic coherence in our corpus was created by Robert, a 73-year-old man who explained his entire life by his rebellion against the Nazi ideology which his parents had attempted to instill in him, motivating him to fight against racism, authoritarianism, and orderliness. At the same time this explanation contributed to some degree to causal-motivational coherence, because it not only helped detect similarities across the lifetime, but also explained how an early life experience created life themes. Thus temporal, causal-motivational, and thematic coherence are three aspects of the global coherence of a text, i.e. of any given life narrative as a linguistic product. In contrast, the fourth kind of coherence regards the coherence between a life narrative and a cultural concept of biography, i.e. the normative expectation of what a life and a biographical text should look like. A skeletal sequence of culturally normative, biographically salient events and their normative timing provides a structure to a life narrative, both in terms of temporal sequencing as well as in terms of which events are selected. Rubin and Berntsen (2003) termed this sequence the *life script*.

We did not include in the original paper a good candidate for a fifth aspect of global life narrative coherence. Providing context is a basic hermeneutic principle for allowing interpretation and giving meaning to a text. Global *contextualizing* of a life can be effected in semantic terms by providing information about the social and historical context of the individual's life, and in narrative terms by embedding the remembered life in a beginning, pre-dating personal memory and even the beginning of life, and ending with a retrospective global evaluation and an outlook into the future. The nested structure of life narratives also provides a kind of internal contextualization, with chapters (Thomsen & Berntsen, 2008) covering lifetime periods (Conway, 2005), which in turn include segments covering specific or extended events (Habermas & Hatiboğlu, 2014).

Besides entire life narratives, another manifestation of the life story is autobiographical arguments, which create causal-motivational or thematic links between different elements of a life. In life narratives, they contribute to global coherence (Köber, Schmiedek & Habermas, 2015). In single event narratives, corresponding to single memories, they serve to integrate these into the larger context of a life by relating them to more enduring aspects of oneself or to other, distant events (see dashed lines in Figure 1).

It is very important to distinguish between the local coherence of a single event narrative, which is the prototype of a personal narrative (Labov & Waletzky, 1967), and life story coherence, which regards the entire life. If not otherwise specified, the term *narrative coherence* when applied to autobiographical narratives refers to the coherence within such a single event narrative. In contrast to the life story, the ability to narrate single event narratives develops early on with the help of socializing adults (cf. Fivush, Haden & Reese, 2006). Single event narratives are basically mastered by the early school years, and the ability to narrate single events coherently continues to be refined up to late childhood (e.g., Bamberg, 1997; Nicolopoulou, 2008; Peterson & McCabe, 1983; see Reese, 2014, for a review). The differential developmental course of narrative coherence in single event narratives (e.g., what happened last weekend) and global life story coherence in life narratives was confirmed in a direct comparison: Between ages 9 and 15, coherence for single event narratives increased only moderately, whereas life story coherence increased steeply. Moreover, the two kinds of coherence were not

correlated once age was partialled out (Bohn & Berntsen, 2008; 2013). Narrative coherence of single-event narratives thus develops earlier than life story coherence.

Sometimes the use of the label narrative coherence in the context of single event narratives has not clearly differentiated local coherence within a single event narrative from life story coherence, i.e. the embedding of an event in an autobiographical context in one's life and with respect to one's personal development. Many studies measure local narrative coherence in single event narratives (e.g., Baesler, 1995; Fiese et al., 1999; Klein & Boals, 2010), in one way or another taking the lead from the story grammar (Stein & Glenn, 1979) or the sociolinguistic models of narrative (Labov & Waletzky, 1967).

Several coding schemes have been proposed to rate different aspects of coherence of single event narratives (Baerger & McAdams, 1999; Reese et al., 2011). In each of these coding schemes, only one of the scales includes a link to other parts of life as one possible criterion (e.g., *integration* in Baerger & McAdams; *thematic coherence* in Reese et al., 2011). For both of these scales, there are multiple ways of getting maximum credit. For instance, maximum credit of 3 on the scale of thematic coherence requires a resolution, which might or might not link to other autobiographical experiences or self. Typically these scales are applied to events that have been selected for their centrality in one's life such as high, low and turning points, which are termed *critical event narratives* (Chen et al., 2012). Still these scales almost exclusively measure local coherence, not life story coherence. We thus propose using the term life story coherence in a more restricted sense than Baerger and McAdams (1999) did in their path-breaking study.

In the following three sections, we review evidence regarding the evolution of the life story and of its precursors, especially the relationship between memory and self. We also provide a systematic overview of the wealth of empirical indicators of the life story, grading their relation to the life story. We start by presenting how autobiographical memory and the self are related in development, then review developmental evidence regarding the entire life story, and finally discuss evidence regarding the development of autobiographical reasoning. Our focus is on demonstrating the qualitative change that takes place at the lower threshold of life story development between childhood and adolescence, i.e. roughly around age 10.

Memory and self before and in the life story

Our strong developmental thesis is that the emergence of the life story in adolescence marks a qualitatively new cognitive-communicative format that arises from the development of autobiographical remembering and the development of the self. Both autobiographical remembering and self have been developing from early childhood. Conceptually, the two are intertwined, because autobiographical memories are inherently about self experiences (Brewer, 1996), and the self-concept influences, among other factors, which events are important to retain in one's autobiography (Conway, 2005). This connection becomes explicit, however, only in the context of the adolescent life story.

Empirically, autobiographical memory and self are connected from the second year of life, when young children begin to verbally reference past events (Miller, Chen & Olivarez, 2014) and, at around the same time, develop a critical mass of self-awareness that enables them to recognize their physical selves in mirrors and photos (see Reese, 2002). In a longitudinal New Zealand sample, children who achieved visual self-recognition earlier in the second year of life displayed a faster rate of verbal memory development over the next year when narrating their recent experiences to a researcher (Harley & Reese, 1999). For the same children at ages 4-1/2 and 5-1/2, a more advanced form of self-concept was linked to their autobiographical memory (Bird & Reese, 2006). Children who displayed a more advanced self-concept at these ages were those who consistently endorsed themselves as high or low on nine dimensions of self (e.g., harm avoidance, achievement). Children with advanced self-concepts used more emotional and evaluative information in their autobiographical narratives. This pattern suggests that children with a richer subjective perspective on past events experienced an

advanced self-concept (cf. Wang, 2004). At age 12, the same children again displayed links between autobiographical memory and self-concept. Adolescents who recalled a greater number of specific autobiographical memories from earlier in childhood were those who had also displayed more advanced self-awareness in early childhood (Reese, Jack, & White, 2010). Thus, empirical evidence supports concurrent and longitudinal links between autobiographical memory and self-concept throughout childhood.

Critically, children do not develop these autobiographical memory and self-understanding skills in isolation. From early childhood, mothers support their children's autobiographical memories and their self-concepts in the way they talk to them about past events. In the same longitudinal study, mothers who adopted a more elaborative and evaluative stance – those who discussed memories in rich detail and included emotional information - had children with more detailed autobiographical memories in early childhood (Farrant & Reese, 2000; Newcombe & Reese, 2004; cf. Wang, 2007) and earlier childhood memories in adolescence (Reese et al., 2010; cf. Jack, Hayne, MacDonald, & Reese, 2009). In an experimental study, preschool children whose mothers had been trained in elaborative reminiscing recalled more detailed memories later with a researcher, but only if they had had advanced self-awareness as a toddler (Reese & Newcombe, 2007). Thus, parents' reminiscing style matters for children's autobiographical memory.

One continuity in the relation between remembering and self before and after the advent of the life story lies in the socializing mechanisms necessary for their development. The young adolescents who experienced more elaborative reminiscing with their mothers about specific memories, and who recalled earlier memories, also engaged in more autobiographical reasoning (learning a lesson, insight) when narrating turning point events (Reese et al., 2010). Thus, mothers' reminiscing style supports autobiographical remembering and self in childhood, and is linked to autobiographical reasoning in adolescence. This connection was also found in a cross-sectional study with children aged 8, 12, 16, and 20 in which mothers scaffolded their narrating of an entire life, actively supporting temporal coherence in the children and autobiographical reasoning in the younger adolescents (Habermas, Negele & Mayer, 2010). We will soon be able to test the causal role of maternal reminiscing in adolescents' autobiographical reasoning as we follow up the children from our (Elaine Reese's and colleagues') experimental study into adolescence (Macfarlane, 2014).

Although autobiographical memory and self are intertwined from early in development, we claim that the advent of the life story in adolescence introduces a new quality in the relationship between autobiographical memory and the self. Even though the development of the self-concept and autobiographical memory do influence each other and are partly acquired in the same social interactions, earlier forms of the self-concept are synchronic, or lacking a biographical dimension. Up to early adolescence both self and others are basically described in terms of synchronic attributes such as physical characteristics, preferences, attitudes and habits, and personality traits, but not in terms of their individual life experiences and how they have formed the development of their personalities (Damon & Hart, 1988; Selman, 1980). Likewise, earlier forms of remembering are only implicitly linked to the self, but not tied to identity in a causal-motivational or thematic way as it is by autobiographical reasoning. Thus, the understanding of others and the self turns biographical in adolescence, and autobiographical remembering becomes an essential part of identity (Habermas & Paha, 2001).

We suggest that this integration presupposes specific social-cognitive developments (cf. Habermas & Bluck, 2000) besides the development of remembering and self, or more broadly of narrating and the person concept just outlined. An understanding of calendar time (Friedman, Reese, & Dai, 2011) and knowledge of the cultural concept of biography (Habermas, 2007) are probably also needed to construct a most basic curriculum vitae. An additional element facilitating a narrative approach to a life is epistemological development (Kuhn & Weinstock, 2002), which leads to an understanding that knowledge requires interpretation. These assumed prerequisites are much more specific than Cohler's

(1982) and McAdam's (1985) original suggestion that formal operations were a necessary prerequisite. This specificity is due both to the lack of an integrative theory of adolescent social-cognitive development, as opposed to Piaget's theory of the development of non-social cognition (Inhelder & Piaget, 1958), as well as to our conviction that the emergence of (auto-) biographical thinking is in itself a central step in social-cognitive development. Furthermore, whether the ability to construct a life story is ever actually developed by an individual - and to what degree it is elaborated - depends on motivational factors stemming from the psychological needs to resolve conflicts between the past and present self in the search for an integrated adult identity, as well as the social and cultural expectations and requirements to develop and shape a highly individualized adult identity.

Thus memory and self are closely related throughout childhood. The emergence of the life story in adolescence, however, introduces a new quality to this link by putting the self and others in a biographical perspective. This is an essential part of adolescent social-cognitive development, rendered possible by specific socializing experiences. In the following two sections, we present the developmental evidence for the emergence of the life story in adolescence, first for global properties of the life story, then for autobiographical reasoning. We illustrate this emergence with evidence for the qualitative changes defining the lower developmental boundary of the life story.

Development of global coherence of the life story

Global properties of the life story can be measured in entire life narratives with global rating scales, and by analyzing various aspects of the temporal macrostructure such as beginnings and endings of life narratives, its structuring by normative life script transitions, and its temporal segmentation into life story chapters. Short entire life narratives have been collected orally in two developmental German samples with ages 12, 15, and 18 (Habermas & Paha, 2001) and with ages 8, 12, 16, and 20 at the beginning of an eight-year longitudinal study (for cross-sectional evidence cf. Habermas & de Silveira, 2008; Habermas, Ehlert-Lerche & de Silveira, 2009; Habermas, Diel & Welzer, 2013; for the longitudinal confirmation cf. Köber et al., 2015). Entire life narratives in written form have been collected in two Danish samples with ages 9, 11, and 14 (Bohn & Berntsen, 2008) and with ages 10, 12, 13, and 15 (Bohn & Berntsen, 2013). All four studies showed a steep increase in global coherence in life narratives between late childhood and mid- to late adolescence. In the following, we report qualitative changes in entire life narratives over this period. We do this to highlight the emergence in adolescence of a qualitatively new ability to produce coherent life narratives.

We measured the global coherence of these life narratives in two ways, by global ratings and by analyzing beginnings and endings. In Table 1, we provide a new integrative summary of the transition between childhood and adolescence (ages 8 to 16). To highlight the qualitative changes, we complement the mean values per age group reported in earlier publications by providing relative frequencies of ordinal categories of global coherence. Table 1 clearly shows that overall coherence in the life story in terms of developmental consequentiality, thematic coherence, and endings is completely absent in children's attempts to narrate their life stories roughly below age 10. Below we outline in more detail the qualitative changes in the life story that take place between middle childhood and adolescence.

Habermas and de Silveira (2008) used three rating scales for global textual coherence of the life story: the global temporal orientation provided, the global sense of developmental consequentiality of life events, and overall thematic coherence created for the listener (see Table 1, section 1). Global temporal orientation increased most drastically between ages 8 and 12 and still quite a bit up to age 16, both cross-sectionally and longitudinally. Over 80% of the 8-year olds provided temporal indications for no more than half of the events. Causal-motivational coherence was measured as the degree to which a motivated, plausible development of the narrator's personality based on the biographical significance of events is conveyed (developmental consequentiality in Table 1). It developed at about the same rate up

to age 20, with minor increases up to age 28. At age 8, not one child attempted to describe the development of personality. Four years later, only a third had started claiming some kind of change in personality, though without providing any plausible substantiation. Only at age 16 had a majority named personality development, and only a third had begun to provide some explanation for their personal development. Thematic coherence developed at about the same rate up to age 20, with further increases up to middle adulthood. At age 8, thematic coherence was absent in 81% of children and only implicit in the remaining 19%. Only at age 16 did a majority provide implicit thematic coherence, whereas over half of the participants from middle adulthood onwards provided explicit thematic coherence (Köber et al., 2015).

Thus, in late childhood a temporal structure is mostly absent in attempts to narrate a life. Equally a developmental point of view is absent, as is any explicit thematic coherence. Bohn and Berntsen (2008, 2013) used a different rating scale to measure whether more than one episode was named, whether episodes were in chronological order, and whether they were evaluated, thus focusing mainly on global temporal coherence (see Table 1, section 2). About a third of their 9-year-olds provided only a single episode as a life narrative, and only 5 to 15% provided a good chronological order to the events.

Another way to measure global coherence in entire life narratives is by judging the elaboration of beginnings (Habermas & Paha, 2001) and endings. The least adequate beginning is with an event from any time in life. The next two more adequate beginnings are beginning with the onset of memory and beginning with the onset of life. Birth may be further specified by providing date and place of birth. Finally, a birth story may be used to foreshadow parts or themes of the life to come (Habermas, 2006). In addition, the individual life may be contextualized describing the family one was born into, its socioeconomic circumstances, and earlier family history (Habermas & Hatiboğlu, 2014). Endings should arrive in the present. In addition, they may serve for a global retrospective evaluation of life as well as for an outlook into the future (Habermas, 2006). The middle part of narratives is expected to follow more or less a chronological order.

These beginning and ending parts of the temporal macrostructure are absent in most children's life narratives (see Table 1, section 3). Most children at age 8 lack an understanding that a life story starts with birth and ends in the present, thus violating basic elements of the concept of life story. In the Frankfurt sample, the mean elaboration of beginnings and endings continued to increase until the early 20s. Simply put, the narratives children tell are not organized into a life.

Global coherence of the life story may also be supported by how well it is hierarchically segmented into larger lifetime periods. This development can be measured by the "chapter task" from the Emerging Life Story Interview (ELSI; Reese, Chen, Jack, & Hayne, 2010; cf. Thomsen & Berntsen, 2008, for a similar procedure with adults). In the chapter task, which can be used with children as young as 8 years old, researchers invite children to tell the story of their life as if it were a story from a book. Children are asked to name the chapters from their life story, and to tell the researcher roughly what happened in each chapter, starting with the chapter they are in now, and moving backwards through time. The main measure of organization in this task is the proportion of nominated chapters that form lifetime periods rather than event-specific chapters. For instance, a chapter called "Going to Australia" was classified as an event-specific chapter because it focused on a single event, a family holiday. In contrast, a chapter called "My Primary School Years" was classified as a lifetime-period chapter.

The age differences in this task suggest a dramatic development in the organization of the life story between middle childhood and adolescence (see Table 1, section 4; Chen, McAnally, & Reese, 2013, Figure 1). Specifically, children (8-11 year olds) used predominantly event-specific chapters in their life story, whereas young adolescents (12-14 year olds) used almost exclusively lifetime periods to organize their life story.

Thomsen and Berntsen (2008) provided evidence that biographically salient transitional events, or life script events, tend to demarcate lifetime periods in adults (cf. Thomsen, 2015). Thus these two

structural elements of the life story probably develop together. They are part of the temporal macrostructure of life narratives. This fits nicely with the suggestion that life chapters (Chen et al., 2013), life scripts, and temporal macrostructure (Habermas & Bluck, 2000) all develop before autobiographical reasoning. Following from this argument, we propose that between ages 8-12, children are beginning to master the temporal macrostructure, including the life script and organization into lifetime periods (see Chen et al., 2013). Note that at this same time, children are rapidly developing their culture's conventions of time (Friedman, Reese, & Dai, 2011).

A final aspect of life story coherence is measured by the cultural concept of biography (not represented in Table 1,) and more specifically the life script. The life script contains chronologically sequenced, biographically salient transitional life events with age norms attached to them. The life script helps to structure life narratives, and thereby contributes to its global coherence. Four studies using two different methods show that this normative biographical knowledge is acquired between the ages 8 and 16 (Bohn & Berntsen, 2008, 2013; Habermas, 2007; Saraiva et al., in preparation; for a longitudinal example cf. Bohn, 2011). There was also a tendency for the acquisition of the life script to correlate with the elaboration of beginnings and endings of life narratives (Bohn & Berntsen, 2008, 2013; Habermas et al., 2009). Although one study found that the acquisition of the life script was achieved by age 16 and did not increase after that, it is not clear when the life script begins to be acquired. In a study with 4 to 17-year-olds (Schorsch, 1992) attribution of 48 life events to age categories spanning three years began to increase between preschool and grade school, and reached a maximum at about age 14, suggesting that normative biographical knowledge begins to be acquired in early childhood. In the study by Saraiva and colleagues (in preparation), life script knowledge did slowly increase between ages 6 and 10, the steepest increase was between ages 9 to 10 and 11 to 12, levelling off after age 14, confirming preadolescence as the life phase with the most rapid development of life script knowledge.

To illustrate the way 8-year-olds respond to the task to narrate their lives, we provide three examples of the temporal-topical structure of their replies (taken from the Frankfurt longitudinal study MainLife). Anna starts with an accident, bumping into the refrigerator when she could barely walk, which obviously reports a story her parents had told her. Anna then mentions entering kindergarten at age 3. The kindergarten took a field trip and staged a theater show. Then she talks about entering school, evaluating it negatively and providing several reasons. Anna mentions another girl who was nasty to her only to become a good friend later on. After telling how she bought fish with her father, she gets into telling a series of vacations, listing several activities, to finally dedicate quite some time to the story of an emaciated old cat whom she had fed but was not allowed to keep in the house. Finally she lists who had been her friends, and who still was and who no longer was, ending by simply stopping to talk.

Betty also starts with an accident she had had at age 1. Then she mentions the transition to daycare center and describes daily routines there, ending the section with the narrative of an accident she had had when running. Then she mentions starting school, and again tells the story of an accident, this time with a bike. A final accident involved her friend and a swing. She ends saying: "That's all I have to tell".

Carla asks where she should start, the interviewer telling her she may choose herself. "When I first really changed was when I started school", when she felt confused and overwhelmed. "And when I was in daycare, I fell, and then the nursery teacher, actually my favorite teacher took me to the doctor". She follows up with an accident with a sled at age 7. "And then another thing: Of course I am also very sorry that my parents split up, and my Daddy married another woman. Too bad you can't do anything about it. I already have a stepbrother. Should I go on to tell more?" She then mentions an event with her father before the divorce, a funny event from last winter, and finally that she is sad about having to change schools.

These three examples demonstrate the range of temporal and topical structures of 8-year-olds. Anna keeps a chronological order, and she uses normative transitions as landmarks (transitions to

kindergarten and to school). However, the biographical salience and significance of events is not clear. Anna recounts interesting or emotional events. Betty also includes the early part of her life, follows a chronological order, and mentions normative transitions. The events she chooses to narrate, however, are limited to one topic, accidents. The topical criterion for selecting events was also used by Anna when recounting one vacation after the other. Carla, finally, does not follow a chronological order, but seems to select events on the basis of exceptionality or emotionality. Thus, although 8-year-olds may have a rough chronological orientation in their life stories, they select events less for their biographical salience than for their emotional valence and for their topical interrelatedness. Thus categories of events, or in other words the similarity of events, appear to be a dominant criterion for selecting events for inclusion. Given that children have not yet mastered the complexity of constructing a chronological life, they seem to prefer a classificatory approach to the selection of events rendered possible by concrete operations (Inhelder & Piaget, 1958).

Eight years later, at age 16, Anna starts her life narrative with her birthplace, the quarter of the city where she lived the first three years with her parents, and a story about the daycare center, where she was beaten by a boy, so that her parents had to take her out. At age 3 she entered kindergarten, which was fine. But the progressive school with a very special educational program her parents chose turned out to be not a good environment, so that they again had to take her out of the institution. She was transferred to a standard state school. The transition to high school also went well. Then, however, there was a conflict with a boy who kept bothering her. Finally she recently dropped out of school. The last two stories are about her present and future, i.e. how she just took part in a dance workshop her mother organized, and how this gave her the idea to maybe become a dancer.

Anna begins this later life narrative with her place of birth and growing up and ends it with an outlook into her possible future. The events she narrates have an obvious biographical salience. She no longer narrates accidents or other very mundane events like going to buy a fish, but only events which mark transitions or will prove consequential for later developments. There is a recurrent theme of her parents choosing the wrong educational institutions, combined with a repeated emphasis on her shy personality, leading up to her current failure to continue school. In the middle of having dropped out of school and not knowing how to continue her life, Anna neither evaluates nor explicitly explains this failure, but focuses instead on searching for a perspective on how to continue. In terms of global coherence, the narrative is temporally quite coherent (rating of 6 out of 7); Anna does not explicate the developmental consequences of events (rating of 3 out of 7; there is an implicit, but not explicit theme of her parents choosing the wrong schools and her being too shy to cope with her peers (rating of 4 out of 7; cf. notes to Table 1)..

Development of local indicators of life story development: Autobiographical arguments.

Autobiographical arguments weave together single strands of global life story coherence. Autobiographical arguments can be identified both in entire life narratives and in single event narratives. An ever-growing variety of autobiographical arguments is being used in the literature. Autobiographical arguments may be grouped according to whether they indicate personal change, contributing to causal-motivational coherence, or whether they indicate sameness, contributing to thematic coherence (Habermas, 2011; Pasupathi, Mansour & Brubaker, 2007). Another distinction is between autobiographical arguments that refer to the individual's life as seen from a third-person perspective (e.g., actions, life circumstances, personality, and values) and autobiographical arguments that refer to the individual's own subjective view onto life, such as what is known, what is understood, and how it is evaluated. In Table 2 we have listed the main autobiographical arguments and provided an example for each (cf. Habermas, 2011; Habermas & Köber, 2015b, for a more detailed account).

Researchers use different labels for autobiographical arguments. McLean and Thorne (2003) used the term 'meaning making' for changes in subjective point of view that have been induced by an event

(A1subj, A3subj). Pasupathi and colleagues (2007) termed arguments A1 and B2 ‘self-event connections’. Lilgendahl and McAdams (2011) coded arguments of type A1 in terms of whether the consequences of an event for personal development were positive, calling this ‘positive processing’. Blagov and Singer (2004) coded whether memory narratives referred to other, distant parts of life (argument A6; cf. similarly Bluck & Glück, 2004; Grysman & Hudson, 2010). We believe that some autobiographical arguments are more effective in integrating an event into the life story than others. However, this contention remains to be tested.

Some authors devised brief rating scales which order several autobiographical arguments in terms of how much they contribute to life story coherence. McLean and Pratt (2006) devised a rating scale for meaning making; Chen et al. (2012) adapted the rating scale for developmental consequentiality in entire life narratives (see above) for use with single-event narratives; and Waters and Fivush (2014) proposed a self-functions scale, including any identity-related information, turning point or eye-opening quality of an event without explanation, and finally with an explanation (similar to A1). The advantage of rating scales is that they provide a global judgment with better psychometric properties than relative frequencies of specific autobiographical arguments can offer. On the other hand, ratings are less precise and objective than counting the frequency of specific autobiographical arguments.

Developmental studies of both single event narratives and of entire life narratives have identified autobiographical arguments. Three cross-sectional studies collected high, low and turning point narratives from adolescents, demonstrating age-related increases in the use of autobiographical arguments across adolescence. Grysman and Hudson (2010) compared 14- and 18-year-olds on meaning making (A1subj A3subj); McLean, Breen, and Fournier (2010) compared adolescent boys between ages 11 and 18 on meaning making (A1subj A3subj) and the arguments ‘event explains personality’ (A1obj) and ‘personality explains event’ (B2obj); and Chen and colleagues (2012; Chen, 2011) compared adolescents and young adults aged 12 to 21 on meaning making (A1subj, A3subj) and developmental consequentiality (rating scale)). In all cases, the turning point narratives had the highest frequency of, and the steepest age-related increases in, the use of autobiographical arguments. Turning points by necessity invoke the life story, because they imply a change in the direction of life’s path. Turning points may reflect deeper processing of the event in order to create coherence across the biographical rupture. The 11-year-olds did not use meaning making (A1subj, A3subj) once, and very rarely used arguments explaining personality change based on an event (A1obj; McLean et al., 2010).

The two Frankfurt studies used entire life narratives to measure the frequency of autobiographical arguments. In the pilot study with 12, 15, and 18 year-olds, participants generally used autobiographical arguments more frequently with age (Habermas & Paha, 2001). To better describe the lower threshold of the development of the life story than is possible with mean values for age groups, Table 3 lists the absolute frequencies of participants of the youngest cohort of the Frankfurt longitudinal study MainLife (cf. Köber et al., 2015), who used each autobiographical argument at least once. There is a drastic increase in the use of autobiographical arguments between ages 8 and 16 for the same individuals over time. If it is true that the life story does not develop before adolescence, then children should use no autobiographical arguments. Out of the only four autobiographical arguments of 8-year-olds, two lacked a justification, i.e. they were mere claims that were not backed up by any evidence. The remaining two arguments belong to the simpler arguments of developmental status and personality explains action. We therefore claim that autobiographical reasoning is as good as absent at age 8, and definitely absent in its more complex forms.

Autobiographical reasoning and well-being across adolescence

In the above section, we outlined how autobiographical reasoning develops in adolescence in both the life story and in single event narratives. A critical question for this literature is the function of the life story for adolescents. Why does it matter that the life story develops in adolescence? Are these

changes with age merely an epiphenomenon of adolescents' developing cognitive capabilities, or do they matter in any real way for adolescents' lives? Because coherent life stories are linked theoretically and empirically to psychological well-being in adulthood (e.g., Baerger & McAdams, 1999; McAdams, 2006), our specific focus is on how life story coherence is related to well-being in adolescence. A recent review of the overall absent or weak positive effects of expressive writing in adolescence in contrast to adulthood (Travargin, Margola, & Revenson, 2015) points to the relevance of life story development for well-being, because the positive effects of expressive writing in adulthood are mediated by processes of making sense of the experience. To our knowledge, no research has yet been conducted on coherence of entire life narratives and well-being, so the following review will focus on single event narratives and well-being. To address our central argument about the importance of autobiographical reasoning, we review only those studies that measured autobiographical reasoning in critical event narratives which are likely to evoke autobiographical reasoning, and not studies that measured only the coherence of other single-event narratives (e.g., Baerger & McAdams, 1999).

Understanding the self and its development is highly valued in Western cultures. Interpreting and integrating disruptive life events is potentially beneficial for well-being (Pals, 2006; Park, 2010). More specifically, among 12th graders who reported having experienced a turning point, those who included learning a lesson or an insight in their turning point narrative reported higher well-being than those whose narratives did not include meaning making, even after controlling for their earlier well-being (Tavernier & Willoughby, 2012). In the lifespan sample of the Frankfurt longitudinal study MainLife, having experienced changes in life circumstances in the past four years led to a lower sense of self-continuity. Autobiographical reasoning in life narratives, however, compensated for this loss of self-continuity in those who had experienced biographical disruptions (Habermas & Köber, 2015a).

If one looks at the relation between autobiographical reasoning and well-being irrespective of the experience of biographical disruptions, however, the two do not always correlate positively (McLean & Mansfield, 2011). Rather it appears to be important for well-being that regardless of whether the events included in the life story are positive or negative in valence, autobiographical reasoning leads to a final positive evaluation of those events (e.g., a young man discovered a positive lesson from his parents' divorce that it is important to keep a relationship fresh if it is to endure; Pals Lilgendahl & McAdams, 2011). In the case of highly negative or traumatic events, however, it appears to be better for one's well-being not to position that event as central to one's identity (Rubin, Dennis & Beckham, 2012; see Banks & Salmon, 2013 for related arguments).

Our question for this paper is whether these qualified positive connections observed in adults between autobiographical reasoning and well-being also exist for adolescents. Several studies have now examined the connection between autobiographical reasoning in critical event narratives and well-being in adolescents of different ages. Across these studies, the evidence is now becoming strong that a positive connection exists between autobiographical reasoning and well-being ONLY for older adolescents and emerging adults, but not for younger adolescents. In our study of over 260 adolescents from ages 12 to 21, we measured autobiographical arguments in turning point narratives (Reese et al., 2015). Age moderated the link between developmental consequentiality of narrated events and well-being, specifically for life satisfaction. For older adolescents and emerging adults (aged 18 to 21 years), higher levels of developmental consequentiality in turning point narratives linked to higher levels of life satisfaction; yet for the youngest adolescents in our sample (aged 12 to 14 years), higher levels of developmental consequentiality in turning point narratives linked to lower levels of life satisfaction. Crucially, these links were present after we took adolescents' personality traits of (high) conscientiousness and (low) neuroticism into account, both of which were strong correlates of life satisfaction. Thus, the youngest adolescents with the highest levels of autobiographical reasoning were the *least* satisfied with their lives. These patterns are similar to those McLean et al. (2010) noted with adolescent boys from age 11 to 18 years, with a negative link between autobiographical reasoning

(learning a lesson and insight) in four written narratives (low, high and turning point and a continuity narrative) and well-being for younger adolescents. Note that McLean and colleagues did not find a significant positive link between meaning making and well-being for older adolescents, but the oldest adolescents in that sample were only 18. Even for emerging adults, as explicated above, the positive link with well-being may be present only when autobiographical reasoning results in positive implications for the self or if they regard turning points in life. Banks and Salmon (2013), for instance, found that young adults who reasoned autobiographically about high points and low points with negative implications for self, or who endorsed a low-point event as central to their identity, had lower instead of higher levels of well-being. Similarly, autobiographical reasoning in the form of meaning-making (learning a lesson, insight) about highly negative events was linked to greater depression symptoms for older African-American adolescent girls (16 to 21 years of age; Sales, Merrill, & Fivush, 2013), but this link was no longer present once their external locus-of-control was taken into account. It is possible that autobiographical reasoning is more hazardous for individuals from socially disadvantaged or racially ostracized groups because they experience more negative and less controllable events. As with adults, the valence of the reasoning and the nature and controllability of the event are also important determinants in the link between autobiographical reasoning and well-being for adolescents (e.g., Mansfield, McLean, & Pals Lilgendahl, 2010; Pals Lilgendahl & McAdams, 2011).

It is not too surprising that older adolescents and emerging adults are starting to look like adults in the connections between autobiographical reasoning and well-being. The surprising aspect, of course, is the negative link between autobiographical reasoning and well-being for younger adolescents, even for turning point events, which are not typically highly negative. We suspect that younger adolescents with this pattern are selecting highly negative events as turning points in their lives, and are reasoning about these negative events in a negative way for self. They are unable to turn these negative events into a growth experience because of their limited autobiographical reasoning and coping skills. Young adolescents may also lack the experience that negative events can eventually culminate in positive outcomes over time.

In the following example, a 13-year-old New Zealand Chinese adolescent boy, Tony, chooses a highly negative event for his turning point narrative – the first time his father hit him in the face for not doing his homework – and claims that the event changed him by making him aggressive like his father.

Tony: All right, since my father's probably hit me I given a piece of him to me so I'm now a bit yeah like my dad, um does it make sense?

Interviewer: Okay.

Tony: I'm kind of very aggressive towards other people . . . like ah she's doing the wrong thing, I - I react, I don't mean to over-react, I mean to do it again, but I just stressing out and kind of . . . doing what my dad does.

Interviewer: Okay, anything else?

Tony: And I just don't normally trust people . . . the way I should.

After the event narrative, we prompt the adolescents with questions about how old they were, who was there, and how the event changed their life:

Interviewer: Okay. So when did this happen, how old were you?

Tony: Um I was eight like I said [this event first came up in the life story chapter task administered prior to the critical event narratives] um . . . the first time my dad hit me . . . I um I ahh, I kind of, you know how adults have bad behavior and it transferred 'em to their children, they copy the bad things, the bad things only. . . .

Interviewer: Mmhmm. Um how did you feel?

Tony: Actually it's not a really good side of me . . . it's a very unpleasant side, ah side of me, because "I'm trying to help you" [as if talking to someone else], [but] the other side I [am] over-reacting.

Interviewer: Mmhmm, yeah, um how did the other people feel? Do you know?

Tony: How did the other people feel? Um when I, um over-reacted?

Interviewer: Yeah or you know, you think you've changed and . . .

Tony: Well my mum and dad thinks I'm very aggressive, and um the people on the other I'm growling at might feel unsure, unsecure, cos I'm growling at them instead of trying to help them.

Interviewer: Mmhmm. Okay and how did this event change your life?

Tony: Well, I just kind of learnt all my, learnt off my dad.

Clearly Tony is focused only on how this negative event has changed his life for the worse, by making him aggressive like his father.

Thus, it appears that Bohanek and Fivush's (2010) prediction about the benefits of narrative meaning-making is turning out to be accurate: they proposed that adolescents younger than 14 are unable to resolve the feelings of anxiety and depression that attempts at autobiographical reasoning can create. For younger adolescents, whose autobiographical reasoning has not fully developed, there is no evidence yet that their solo efforts toward meaning-making are positively linked to well-being. They may even have difficulty with the concept of a turning-point event, and especially the concept that a negative event can have positive spinoffs in the long-term. For younger adolescents, scaffolded autobiographical reasoning may be necessary to create positive growth, especially from highly negative events (see McLean & Mansfield, 2011). When older adolescents engage in autobiographical reasoning about turning points, in contrast, those who are able to take a balanced, integrated view of events concomitantly experience higher levels of life satisfaction.

The positive connection between autobiographical reasoning and well-being at older ages has obvious practical importance for young people. Of course, we do not know from these studies whether autobiographical reasoning plays a causal role in enhancing well-being for older adolescents and young adults, or in decreasing well-being for younger adolescents. Because young adolescents experience a rise in depressive symptoms (e.g., Petersen et al., 1993), it seems equally plausible that young adolescents might begin casting about for reasons why they suddenly feel so much worse than they felt just one or two years prior. They may become prone to ruminating on negative events from their lives, combing through each one to discover if this could be the reason for their sour mood. We are both currently exploring the role of rumination in the connection between autobiographical reasoning and well-being for young adolescents. We are also following the young adolescents in our sample longitudinally to discover whether, and if so at what age, this negative link between autobiographical reasoning and well-being in early adolescence turns positive in the same individuals over time.

Culture and autobiographical reasoning

Undeniably, cultural differences exist in both autobiographical memory and self. Compared to Western children and adults, East Asian children and adults recall fewer specific memories, and their autobiographical memory generally begins at a later age in early childhood (see Wang, 2013 for a review). Wang (2013) interpreted these differences as arising from the Western focus on the independent, autonomous self in comparison to the East Asian focus on the interdependent, connected self. We acknowledge that all individuals aspire to develop both independent and interdependent selves in a complex "coexistence of orientations" (Killen & Wainryb, 2001, p. 17), yet there are identifiable leanings across cultures toward independence or interdependence (Chandler, 2013). Our question in this context is whether or not the cultural differences in autobiographical memory, which may reflect a difference in independence/interdependence orientation, extend to autobiographical reasoning. If so, what would that difference portend for identity?

Wang (2013) concluded that there is less social support for autobiographical remembering in interdependently than in independently oriented cultures. We know that East Asian parents are less

elaborative than Western parents when reminiscing with their young children about personal experiences (e.g., Wang & Fivush, 2005). As reviewed above, in late childhood and early to mid-adolescence, maternal reminiscing in Western families is linked to adolescents' autobiographical reasoning in critical event narratives (Reese et al., 2010) and in entire life narratives (Habermas et al., 2010). Early adolescents whose mothers discussed events from early childhood in an elaborative fashion evince higher levels of meaning making in turning point narratives about life-changing events at age 12 (Reese et al., 2010). Do adolescents in interdependent cultures progress in their autobiographical reasoning in the same way and at the same rate as adolescents in Western societies?

We collected life story chapters and critical event narratives from adolescents aged 12 to 21 from three cultural subgroups in NZ: indigenous Māori, Chinese, and European (Reese et al., 2014; 2015). Māori adolescents possess dual orientations in that they are more interdependent than adolescents from the dominant European culture, but simultaneously possess a strong independent self (Jose & Schurer, 2010). Chinese adolescents in NZ vary in their interdependent orientations, most likely as a function of their acculturation (Jose & Schurer, 2010). In their life story chapters, the NZ Chinese adolescents in our sample (over half of whom were born outside NZ) included fewer specific, one-point-in-time memories compared to NZ European adolescents (Chen et al., 2013), in line with comparisons between Asian and Western individuals (e.g., Wang, 2006). Critically, only the NZ European adolescents displayed the expected age-related increases in autobiographical reasoning as measured by the rating of developmental consequentiality (Reese et al., 2014). For turning point narratives, the Māori and Chinese adolescents were also lower in their autobiographical reasoning (again, via developmental consequentiality), but not significantly lower in their local narrative coherence (single-event thematic coherence) compared to European adolescents (Reese et al., 2015). To our knowledge, this study is the only cross-cultural study of autobiographical reasoning in adolescence in the literature to date.

The results fit with proposals that young people in interdependent cultures will present less explicitly elaborated autobiographical selves in terms of autobiographical reasoning, but that they may find other narrative paths to identity (Chandler, 2013; Dunlop & Walker, 2013; Wang, 2013). For our Māori adolescents, their local narrative coherence was more developed than their autobiographical reasoning. Local narrative coherence can rely on other forms of meaning-making – through elaboration of the emotions involved or through a change in their understanding of others or the world – than the explicit focus on self required for the most complex autobiographical arguments in Table 2. In the following example, Erana, an older Māori adolescent, describes a change in her understanding of the world as a result of racial bullying. The narrative received maximum credit for local narrative coherence, but did not reach the highest level of autobiographical reasoning on Chen et al.'s (2012) developmental consequentiality scale because of the absence of an explicit link to personality. In terms of autobiographical arguments we find a general insight (A2subj) and a specific lesson learnt (A3subj), but no argument involving change in personality (A1):

Oh there was this one incident when I went somewhere and they all started talking Māori thinking I couldn't understand it 'cause I was white and, and I answered back to them in Māori and you know you should have seen their faces but it was just like, OK so because I'm white I have to prove more so that I'm Māori, but I know brown people that don't know how to do anything you know but they don't have to prove it because they're brown. So that, that kind of opened the world to me and up for me and OK, so this is what the world's like, you know. There are a lot of stereo-types and so that changed that side of me and that made me more determined. To prove, even though you shouldn't have to prove but I do. Like I want to show people that yeah I am and don't underestimate me just because I've got white skin. You know because it's not the only factor and so that, that particular bullying and sort of would have been a big change in how I perceived things, yeah.

Crucially, however, in the same sample, the links between autobiographical reasoning and well-

being at different ages were similar across independent and interdependent subcultures. Across all three groups, as noted above, older adolescents and emerging adults with higher autobiographical reasoning (developmental consequentiality) reported greater well-being, and younger adolescents with higher autobiographical reasoning reported lower well-being. Notably, the Māori and Chinese adolescents in our sample were of similar socioeconomic status to the European adolescents (Reese et al., 2015). This finding of cultural similarity in links to well-being was somewhat surprising, given the cultural differences we found in overall levels of autobiographical reasoning. It underscores the importance of autobiographical reasoning for well-being across cultures.

We speculate that the need to make connections between one's past and present self is pressing in contemporary society, regardless of one's culture. Wang (2013) discussed the presentation of an autobiographical self through blogging and social networking as a given for most adolescents in today's global internet culture (cf. McLean & Breen, 2014). We argue that the need to make sense of events for oneself is present for adolescents across contemporary cultures. Thus, self-presentational requirements are ubiquitous, but the way that the self is constructed and presented to others is likely to differ across cultures and subcultures. For instance, American bloggers reveal more intimate details about themselves in their blogs, whereas Taiwanese bloggers focus more on social relations (Chen, 2010).

What is the impact of these new methods of self-presentation for autobiographical reasoning and for identity? We argue that the nature of self-presentation in the virtual world may have an even larger impact on autobiographical reasoning, and ultimately on identity, than does one's culture. Around the world, young people today do much more micro-blogging (e.g., status updates on Twitter and Facebook) than macro-blogging, and the majority of micro-bloggers now are teenagers (Duggan & Brenner, 2013). Micro-blogging presents a brief slice of life, not necessarily a narrative, and can be disconnected from other events. On the other hand, micro-blogging on social networking sites such as Facebook can offer the adolescent a linear, yet highly selective, representation of self in which significant events are automatically ordered into a chronological timeline (see Manago, 2015; McLean & Breen, 2014), supporting at least the development of a rudimentary curriculum vitae-like life story. Macro-blogging, in contrast, may encourage autobiographical reasoning through the need to present a coherent, integrated self to a virtual audience. Perhaps its most developed form is the digital life story (see Lambert, 2013). In future research, it will be interesting to explore the impact of micro- and macro-blogging on autobiographical reasoning abilities and on identity.

Future research on the development of the life story

We suggest that testing and expanding the existing theoretical model will further solidify and refine life story theory, and that extending the scope of research to functional and socio-cultural conditions, and to consequences of the use of the life story, will increasingly demonstrate its significance for coping with everyday life. While adolescence is relatively well studied, precursors to the life story in late childhood still need further longitudinal confirmation. Regarding continued development in adulthood, several studies compared the use of autobiographical arguments in single event narratives in cross-sectional comparisons across adulthood with somewhat contradictory results (Bluck & Glück, 2004; McLean, 2008; Pasupathi & Mansour, 2006; Singer, Rexhaj & Baddeley, 2007). The one longitudinal study with more than two adult groups is compatible with McLean's finding (2008) in suggesting an increase in causal-motivational coherence up to the mid- to late-20s, and of thematic coherence up to the 40s (Köber et al., 2015).

Once the life story format is acquired by the end of adolescence, the relative stability of the life story merits study (Negele & Habermas, 2010). The claims that the life story is an internalized, evolving story of the self (McAdams, 1985) and that a life story schema is a cognitive representation of a skeletal version of the life story (Bluck & Habermas, 2000) require a certain stability of life narratives being told

over time. The more a coherent life story is constructed, the more stable it should become. In addition, once a life story is constructed, ideally it should flexibly adapt to newly emerging life experiences without violating basic truth claims (Conway, Singer, & Tagini, 2004), thereby maintaining a sense of self-continuity.

Finally, the relation between autobiographical reasoning and global coherence in life narratives may need to be reconsidered once non-Western cultures or special situations or populations are studied. To date, we considered autobiographical arguments in life narratives to contribute to their global coherence (Habermas & Bluck, 2000), which was confirmed in a lifespan sample (Köber et al., 2015). However, in cultures in which the life story is less well-established and in which finding an individual identity and life course is less normative, extensive autobiographical reasoning may be less successful because it is less practiced than in Western cultures. There may be undiscovered forms of narrative meaning-making in non-Western cultures that can only be uncovered through ethnographic study (see Miller, Fung, & Koven, 2007). Similarly, in acute critical life situations, autobiographical reasoning may reflect the attempt to create personal continuity and to integrate disruptive experiences into the life story, yet without success. In these situations, extensive autobiographical reasoning may express the attempt to create global coherence in a life without succeeding, taking on the form of rumination.

These considerations point to the significance of the life story in everyday life. Both cross-cultural studies as well as studies of individuals in life transitions or crises will help test both the suggested situational influence on the relation between life narrative coherence and autobiographical reasoning, as well as conditions for autobiographical reasoning to be helpful for bridging biographical ruptures. Furthermore, studies of the life circumstances and socializing experiences that motivate and help to develop the life story are needed. Societies with strong requirements for individualized identities and life courses, and even more so societies which require lifelong adaptations of psychosocial identity, will promote the life story because it is the most flexible integrative form of identity (Giddens, 1991). More traditional, rural areas of non-Western countries may demand less of a flexible format of identity. Listening to stories, reading novels and biographies, and possibly also more complex practices of biographical self-presentation in the social media create a culture in which autobiographical reasoning is valued and fostered.

However, the evidence for such a link between societal requirements of lifelong individual flexibility, media use and life story elaboration is scarce. Habermas and de Silveira (2008) reported a moderate correlation between autobiographical practices and life narrative coherence. Mar, Peskin and Fong (2011) found no evidence for a link between reading and the development of the life story, not because of evidence to the contrary, but due to a lack of studies. A more direct influence might be exerted by competent life story constructors, especially parents who know their children's lives, but also teachers, who scaffold adolescents' autobiographical reasoning. The little evidence available points in this direction (Habermas et al., 2010; McLean & Mansfield, 2012; Reese et al., 2010).

As life continues to be lived, the life story needs to evolve by adding new chapters, and by adjusting and partially rewriting as life experiences illuminate the past in a new light. Thus constructing a life story is learnt in adolescence, and may from then on maintain a certain stability. However, life story work remains a lifelong task, depending on how much the existing life story is challenged by real life.

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Table 1

Relative Frequencies of Various Indicators of Global Coherence of the Life Story between Ages Eight to Sixteen

Indicator	Categories/ Values	Age Groups			
		8-10	11-12	13-14	15-16
1) Global textual coherence					
Frankfurt Longitudinal ^a					
Temporal Orientation ^b	< 50% events	43%	5%		0%
	50% of events	38%	14%		5%
	> 50% events	19%	81%		95%
Developmental Consequentiality ^c	no personality change	100%	67%		24%
	personality change mentioned	0%	33%		43%
	personality change substantiated	0%	0%		33%
Thematic Coherence ^d	absent	81%	48%		14%
	implicit	19%	48%		76%
	explicit	--	5%		10%
2) Chronological order and evaluation					
Arhus Cross-Sectional ^e					
Bohn & Berntsen 2008	Single event	28%	3%		0%
	Several events	68%	58%		13%
	+ Chronology	5%	40%		88%
Bohn & Berntsen, 2013	Single event	38%	18%		5%
	Several events	42%	54%		24%
	+ Chronology	20%	29%		71%
3) Beginnings and endings					
Frankfurt Longitudinal ^a					
Beginnings	anytime after birth	74%	57%		33%
	at birth	19%	29%		19%
	birthdate, -place	0%	14%		48%
Endings	anytime in life	86%	10%		0%
	present	14%	71%		43%
	+ retrospect/prospect	0%	20%		57%
Aarhus Cross-Sectional, Study 1 ^e					
Beginnings	anytime after birth	60%	25%		16%
	at birth	23%	10%		3%
	birthdate, -place	18%	75%		81%
Endings	anytime in life	73%	25%		9%
	present	28%	53%		34%
	+ retrospect/prospect	--	23%		56%
4) Lifetime periods					
New Zealand cross-sectional ^f					
	Chapters with lifetime periods	33%	48%	92%	96%

Note. a - Longitudinal data for oral life narratives N = 21 initially 8-year-olds, measured again at ages 12 and 16. For age 8, values are reported for the first of two life narratives. Unpublished data taken from the study reported by Köber and colleagues (2015). b - Values 1-3: less than half of events are temporally located, 4 - half of the events are, 5-7 - more than half of the events are. d - Values 1-2: No change in personality mentioned, 3-4: personality change claimed but not substantiated, 5-7 plausible personality change mentioned. d - Values 1-2: No thematic coherence, 3-4: implicit thematic coherence, 5-7 explicit thematic coherence. e - Cross-sectional data for written life narratives from two independent studies. Study 1 had N 42, 43, and 37, study 2 had N = 32, 42, 48, 40 participants. f - Cross-sectional data from chapter task from two independent studies. Study 1 had n = 76 8-10 year olds and 48 11-12 year olds. Study 2 had 29 12-14 year olds (M age = 13.52 years).

Table 2

Autobiographical Arguments Contributing to and Indicating Life Story Coherence, Arranged in Descending Order of Assumed Centrality to Life Story Coherence

A. Arguments contributing to causal-motivational coherence (change)	
A1 Event explains self-related change	
Objective: Event explains change in personality/values <i>When I was 17 my father died unexpectedly/ Up to then I had been a careless adolescent/ who had never given a thought about the future/ This experience turned me into a responsible adult worrying about life.</i>	Subjective: Event motivates insight into/reveals personality/values <i>I had always believed to be an independent person./ Only when Anna had left me/ and I could not get over it for over a year/ I realized/ how much I needed a person close to me.</i>
A2 Event explains world-related change	
Objective: Event changes important life circumstances <i>When I went to prison,/ I lost my job and my house/ and my wife divorced me.</i>	Subjective: Event motivates general insight/new knowledge/re-evaluation <i>I was missing him for many months. /Probably it's always like that, /when it's the first kiss.</i>
A3 Event explains self-related situation-specific change	
Objective: Event provides biographical background for specific sensibility <i>She really freaked out/ when this guy touched her./She had been beaten regularly by her father.</i>	Subjective: Event motivates learning specific lesson <i>In my Freshman year I ran over a friend/ when I was driving drunk./ This taught me never to drive a car/ when I have had as much as a sip of alcohol</i>
A4 Formative influence of life circumstances/significant others	
Objective: <i>I grew up in poverty/ which has really shaped the way I deal with goods/ I just can't throw away anything.</i>	Subjective: <i>I grew up in poverty/ which has really taught me to become a modest person.</i>
A5 Contrasting past to present	
Objective: Past state of things contrasted to present state of things <i>I was enjoying my life/ and sleeping around with different women/ I no longer do that</i>	Subjective: Past subjective view contrasted to a present subjective view <i>Then I thought /that personal liberty was the most important thing in life/ Now I know /how important it is to keep up relationships.</i>
A6 Event causally connected with other distant event in life	
Objective: <i>When I was a child/ we used to live in Japan/ and I learnt the language/ Later this very much helped me find a job in international banking</i>	

A7 Concept of lifespan development/developmental status invoked	
Objective: <i>I was only 4 then,/ therefore I didn't understand/ why my mother left Dad</i>	
B. Arguments contributing to thematic coherence (stability)	
B1 Metaphor describes personality or life	
Objective: <i>My life has been like a roller coaster/ with all the ups and downs</i>	
B2 Personality explains/is exemplified by an action/event (or not)	
Objective: Personality/value explains action <i>I defended him against all the students/ who made fun of him/ because I can't bear seeing people being treated unjustly</i> Action exemplifies personality/value <i>I am a person who just can't stand injustice/ for example when at my school everybody made fun of this poor guy/ I spoke up ...</i> Action dismissed as atypical for self <i>Everybody made fun of her/ because she was stuttering/ and I laughed as well/ although usually I am someone /who treats everybody with respect</i>	
B3 Event declared typical for many other events (nuclear episode)	
Objective: <i>I was really afraid of this exam/ but I didn't prepare it/ I just tried not to think of it/ a week before the exam I was in panic/ and started preparing day and night/ of course it didn't help much./ I have to admit/ that this is my usual way of dealing with things /I am afraid of/ I just try to ignore them/ until it's too late to do something about them.</i>	
B4 Comparing past and unchanged present	
Objective: Past state of things is same as present state of things <i>I was enjoying my life/ and sleeping around with different women/ I still do that</i>	Subjective: Past subjective view is same as present subjective view <i>I thought /that personal liberty was the most important thing in life,/ and I am still convinced,/ that my freedom is the most important thing in my life.</i>

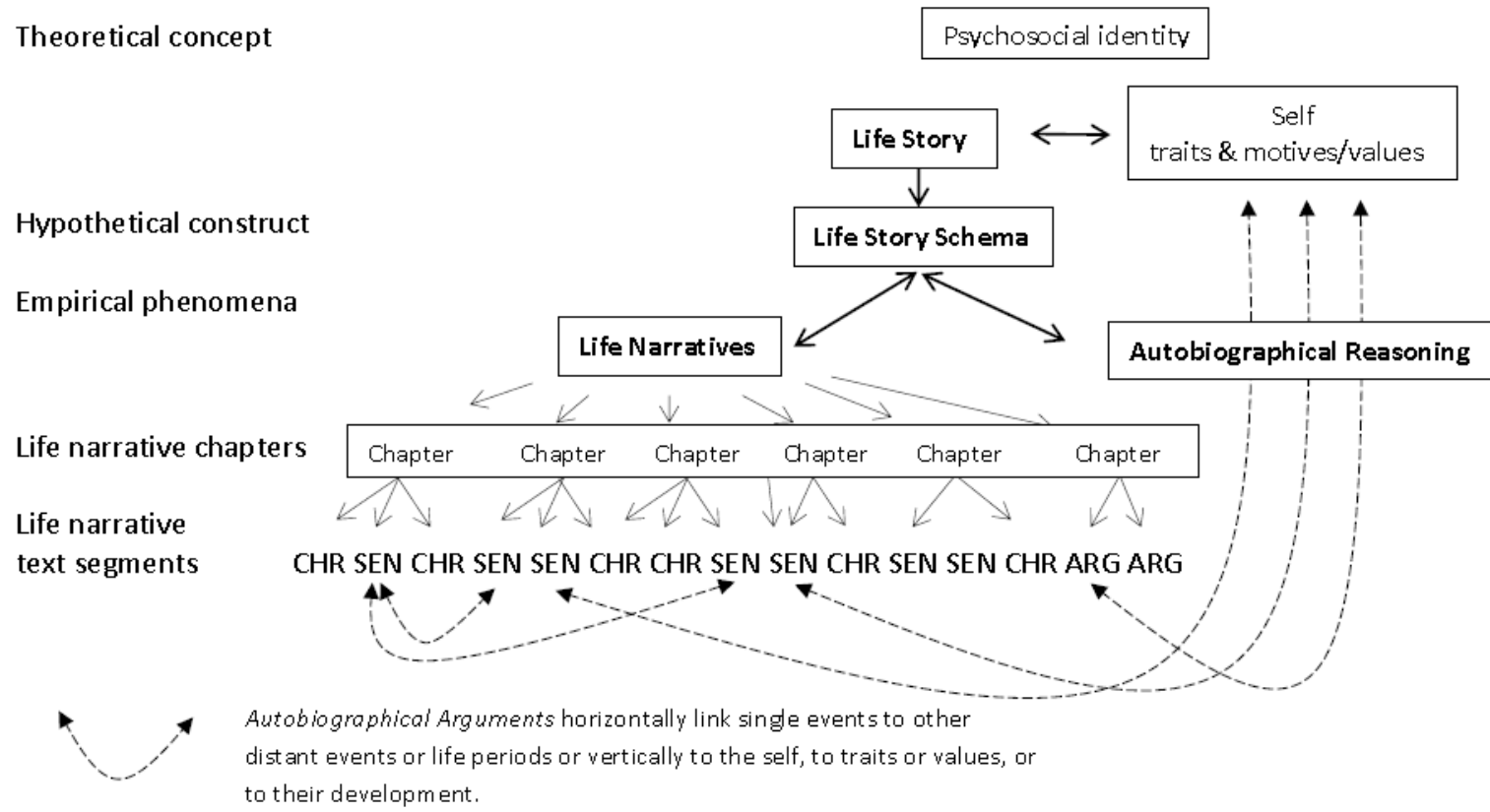


Figure 1. The life story and its Components. Text types: CHR – chronicle; SEN – single event narrative; ARG – argument.