ORIGINAL ARTICLE

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Themes of trust, identity, intimacy, and generativity in important autobiographical memories: Associations with life periods and life satisfaction

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Abstract

Introduction: Guided by Erikson's theory of psychosocial development, the present study investigated whether themes of trust, identity, intimacy, and generativity are represented in older adults' most important autobiographical memories. Furthermore, we tested whether these themes are associated with certain life periods and whether having important memories (i.e., life story) that reflect developmental themes and are evaluated as positive is associated with life satisfaction. **Methods:** One hundred and twelve (59.8% female) older adults (61–92 years,

M = 70.96, SD = 6.81) reported up to 15 important autobiographical memories. Participants rated each memory according to the themes of trust/mistrust, identity/confusion, intimacy/isolation, and generativity/stagnation.

Results: Using multilevel multinomial logistic regression, we found childhood memories to be associated with trust, memories from participants' youth with identity and intimacy, and adulthood memories with intimacy and generativity. Moreover, participants who rated their autobiographical memories (i.e., life story) as high in reflecting themes and, at the same time, perceived their memories as more positive showed higher levels of life satisfaction.

Conclusion: Important autobiographical memories reflect how an individual became the person of today. They refer to age-related themes of psychosocial development and are associated with a person's life satisfaction if they are also considered as emotionally more positive.

KEYWORDS

emotional valence, Erikson, generativity, identity, important autobiographical memories, intimacy, life satisfaction, trust

1 INTRODUCTION

Autobiographical memories are representations of personally important past events. They are considered to be

"the content of the self and define who we are, who we have been, and importantly, who we can yet become" (Conway & Williams, 2008, p. 893). As such, autobiographical memories provide the foundation of our sense

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of self and identity (Conway & Pleydell-Pearce, 2000). The relation between autobiographical memory and the self is assumed to pertain, in particular, to important autobiographical memories because they involve the most significant events of one's life (Glück & Bluck, 2007) and are assumed to be one manifestation of the personal life story (Köber & Habermas, 2017). Hence, a person's most important autobiographical memories may not only describe specific past events but also reflect how this person has developed over time. Following past research, the present study aimed to examine the association between specific themes important for human development and autobiographical memory. Specifically, we tested whether important autobiographical memories, and thus a person's life story, reflect developmental themes such as trust, identity, intimacy, and generativity (or their respective counterparts) and whether the events remembered were experienced during the life period in which the respective theme is expected to be most dominant (Conway & Holmes, 2004; McAdams & de St. Aubin, 1992; Wilt et al., 2010). Moreover, we examined whether seeing one's life as a story that involves developmental themes and, at the same time, is perceived as generally more positive is related to a person's well-being (e.g., Schiller, 1998; Wilt et al., 2010).

1.1 | Themes of trust, identity, intimacy, and generativity

Over 60 years ago, Erikson postulated a lifespan model of human development (Erikson, 1959, 1963). According to this theory, a person develops in a series of stages. Each stage is characterized by a theme, which emphasizes the influence of social interactions and relationships on human development. In the present study, we focus on four of these developmental themes, namely trust, identity, intimacy, and generativity and whether these themes are represented in important autobiographical memories.¹

Basic trust is associated with the first years of life. During this time, a child is dependent on the primary caregiver's stability and consistency of care so that their basic needs will be met. If the caregiver fails to provide care and love is inconsistent, unpredictable, and unreliable, a child may develop feelings of mistrust. The theme of trust parallels the notion of attachment security (vs. insecurity) postulated by Bowlby and Ainsworth and was extensively elaborated in theory and research within their attachment theory (Ainsworth et al., 1978; Bowlby, 1969). From adolescence (Erikson, 1963) until the late twenties (Arnett, 2000), individuals are concerned with identity development. They search for a sense of self and personal identity, for instance, through personal exploration

(Erikson, 1968), and move toward making enduring choices in relevant life domains such as work. This often includes getting independent from primary caregivers and focusing on social relationships with peers. Success at this stage results in a strong sense of self, well-defined beliefs and values, and independence. It provides the young person with a sense of well-being, self-acceptance, and self-esteem (Schwartz, 2007). By contrast, failure leads to a weak sense of self and role confusion which causes doubt about the meaning and purpose of the own existence (Sokol, 2009). In early adulthood, individuals may still be concerned with the development of identity (Kroger et al., 2010) but also with forming intimate, loving relationships with others (Arnett, 2000; Erikson, 1963; Whitbourne & Tesch, 1985). This involves romantic and platonic relations as well as physical and emotional intimacy. Positively engaging in this theme can lead to a sense of commitment and security within an intimate relationship. Not being able to build intimate relationships can result in feelings of isolation and loneliness and is related to negative well-being outcomes and adjustment (e.g., Weisskirch, 2018). During middle adulthood, adults face the theme of generativity versus stagnation which highlights the adult's role "in establishing and guiding the next generation" (Erikson, 1963, p. 267). Hence, the theme includes the care for and contribution to the next generation's life. It broadly applies to family, relationships, work, and society and can be achieved in multiple ways (e.g., McAdams & de St. Aubin, 1992). For instance, adults create things, raise children, and become involved in community activities and organizations, but this can include any activity that contributes to the development of others and the life of the generations. A positive engagement is expected to be followed by accomplishment and feeling useful, while failure may result in stagnation and unproductivity.

Notably, although these themes have their own time of ascendancy, they can be present to some degree before or after the period in which they are most salient. This is why Erikson's theory is sometimes referred to as a model of "epigenesis", such that a developmental theme is initiated at a particular point in time but can re-arise at various times as a life-long task (Gilleard & Higgs, 2016). Related to that, some researchers argued for expanding conceptualizations of these themes and even eliminating any age constraints (e.g., Kotre, 1984). Consequently, the association between life periods and developmental themes should not be treated in an absolute but rather in a relative manner. For example, the development of trust is critical during the first years of life when the child is utterly dependent upon adult caregivers. With age, children become more autonomous, but it usually takes until late adolescence or even young adulthood to become independent. Consequently, the relationship with parents (or other adult caregivers) remains important and can shape the development of trust throughout childhood but may become less important from early adulthood onwards.

One way to empirically approach Erikson's theory of psychosocial development is the examination of (important) autobiographical memories. For instance, Conway and Holmes (2004) asked older adults, aged between 62 and 89 years, to freely recall up to three memories from their first six decades of life. The authors then coded the memories according to the developmental themes proposed by Erikson (1959). Results showed that the content of memories recalled from different decades corresponded to the developmental theme dominant during the respective decade. For example, childhood memories stemming from the first two decades of life reflected themes such as positive or trusting relationships with others, whereas memories from older age included themes indicating generativity (e.g., caring for others, contributing to society). Similarly, Wilt et al. (2010) asked adults (aged between 28 and 74 years) to report a positive and a negative childhood scene, a vivid adolescent memory, an important memory from adulthood, and an imagined, idealized scene for the future. Memories from childhood and adolescence contained high levels of interpersonal trust (M = 5.31; range: 0 to 6), and scenes from adulthood contained moderate levels of generativity (M = 3.64; range: 0 to 6). Hence, there is some, though sparse, empirical evidence showing that autobiographical memories reflect themes of trust, identity, intimacy, and generativity (or their respective counterparts). More importantly, the age at encoding corresponds to when specific developmental themes are expected to be most dominant.

1.2 Developmental themes and life satisfaction

According to Erikson's theory, a positive engagement with each theme leads to the development of ego strength, a sense of inner unity, and the capacity "to do well" (Erikson, 1968, p. 92). Indeed, empirical research demonstrated that striving for intimacy, generativity, or ego integrity was associated with higher life satisfaction in adults aged 17 to 82 (Sheldon & Kasser, 2001; see Ackerman et al., 2000 for similar results). Similarly, Sneed et al. (2012) found that identity and intimacy during young adulthood moderately correlated with life satisfaction in midlife. These results highlight that individuals who manage developmental themes such as identity, intimacy, and generativity in a positive way may show higher life satisfaction.

Importantly, this also holds for autobiographical memories that reflect a positive engagement with these themes. For instance, Schiller (1998) coded 62 retrospective interviews about important aspects of participants' lives from high school until the date of the interview according to favorable developmental outcomes such as relationship intimacy (i.e., intimacy versus isolation) and career commitment (i.e., identity versus identity confusion). The authors found these developmental outcomes to be correlated with life satisfaction. In the study by Wilt et al. (2010) mentioned above, the authors also examined whether life story narratives that reflect the developmental themes of trust or generativity have higher levels of psychosocial adaptation, including generative concern, social well-being, and life satisfaction. Their results showed a small but positive correlation.

When focusing on the association between developmental themes and life satisfaction, it might be important not only to consider the extent to which a person's important autobiographical memories (i.e., life story) refer to different developmental themes but also how positively a person evaluates their memories. To illustrate, a person's memories may (on average) reveal high levels of trust and, thus, reflect their overall concern to develop trust in life. If, at the same time, these memories were rated as emotionally positive, they may describe instances that supported the development of trust. In contrast, if a person evaluates their important autobiographical memories as more negative, on average, this could imply that a person's life story is composed of instances in which it was difficult or not possible to develop trust. As such, including the emotional evaluation of one's life story as an indication of the development of trust, identity, intimacy, and generativity may offer meaningful explanatory power concerning psychosocial adaptation (e.g., life satisfaction). For instance, a more positive life story may be associated with less identity disturbance (Lind & Thomsen, 2018) and more attachment security which might indicate the development of trust (Thomsen et al., 2020).

1.3 | Aims of the present study

The present study aimed to investigate to which extent important autobiographical memories mirror themes of trust, identity, intimacy, and generativity (or their respective counterparts). First, we examined whether important autobiographical memories refer to these themes and whether the age at which events took place corresponds to the life period during which themes would be most likely to be encountered. According to Erikson's theory of psychosocial development, the theme of trust is most salient in infancy, though not limited to infancy. Based on the



notion that trust is still relevant, although to a lesser extent as well as due to the limited recollection of autobiographical memories from a very young age (e.g., Rubin, 2000), we expected the period of childhood to be stronger associated with important autobiographical memories referring to themes of trust than the periods of young and middle adulthood (cf. Wilt et al., 2010). In contrast, the life period of adolescence and young adulthood may be associated with memories referring to identity and intimacy. Finally, the period of middle adulthood may be associated with important autobiographical memories containing themes of generativity. We complement previous findings by using a different methodological approach. In previous research, memories were coded so that each memory could only refer to only one theme (Conway & Holmes, 2004; Wilt et al., 2010). In the present study, we asked participants to recall up to 15 important autobiographical memories and to rate each memory according to the themes of trust, identity, intimacy, and generativity. By considering the relative extent to which memories refer to these themes, we acknowledge that each has a particular time when it is most salient but that it is not restricted to that time and can (re-)occur throughout development (e.g., Syed & McLean, 2018; Whitbourne et al., 1992).

In a second step, we examined how developmental themes represented in important autobiographical memories (i.e., the life story) are associated with a person's life satisfaction (e.g., Wilt et al., 2010) and whether this association depends on the emotional evaluation of their life story. The emotional evaluation of important autobiographical memories (i.e., the life story) may reflect how well a person has met the challenges of developing trust, identity, intimacy, and/or generativity. Consequently, life satisfaction should be highest for those individuals who rate their autobiographical memories as high in reflecting themes of trust, identity, intimacy, and/or generativity and, at the same time, rate their memories as emotionally more positive. Individuals, who also rate their memories high in reflecting themes of trust, identity, intimacy, and/ or generativity but evaluate their memories as emotionally less positive, may show lower levels of life satisfaction.

2 | METHODS

2.1 | Participants

Participants were recruited through ads in local newspapers in Southern Germany and flyers. After excluding one person who did not report any autobiographical memory, the sample comprised 112 (59.8% female) older adults aged between 61 and 91 years (M = 70.96, SD = 6.87). More than half of the participants reported being married

(58.9%), 18.8% were divorced, 15.2% were widowed, and 7.1% reported being single. Furthermore, 83.0% of the participants had one or more children. 63.4% of the participants lived with their partner or another family member, one person reported living in a residential care home, and 35.7% lived alone. Regarding educational background, 37.5% of the participants reported having graduated from university, and 16.1% of participants graduated from high school. Note that in Germany, a high school degree involves approximately 13 years of formal education. In addition, 30.4% reported having Realschulabschluss, and 16.1% finished Haupt-/Volksschule, corresponding to 10 and 9 years of formal education.

2.2 | Procedure and measures

Data come from a study focusing on different types of longterm memories in older adulthood.³ The study and the analysis plan were not pre-registered in an independent, institutional registry. The study was conducted in accordance with the Declaration of Helsinki and approved by the ethical committee [anonymized for review]. In the first step, a questionnaire set was sent to participants' homes. They were asked to provide demographic information and complete individual differences measures such as a personality questionnaire. The autobiographical memory task was carried out in an interview-like setting at one of our laboratories at [anonymized for review]. Participants gave written consent before starting with data collection. In the following, we will describe the measures and the procedure that are relevant to the present research.

2.2.1 | Autobiographical memory task

Older adults were interviewed individually by a research assistant that had been trained regarding the study procedure and the tasks used in the present study. After giving their informed consent, participants were asked to recall up to fifteen important events from their lives and briefly describe each event based on the following instruction:

Please try to remember the fifteen most important events in your life and report them briefly. It does not have to be anything extraordinary, and there are no right or wrong answers. It is only important that it is a specific event you have personally experienced and that the event is important to you.

The interviewer wrote down a short description of each event in two or three keywords.

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2.2.2 | Memory ratings

After having described the memories, participants reread the description of each memory and answered several questions concerning the events described. First, participants were instructed to rate their age at the time of the event. Next, they were asked to judge the emotional valence of the events on a 7-point Likert-type scale ranging from 1 (very negative) to 7 (very positive). Subsequently, the interviewer gave participants detailed instructions on how to rate the event according to the four themes using two examples (see Appendix A). The interviewer did not continue until participants had understood the examples and had no more questions regarding the task. Participants were asked to judge the extent to which each event described in the memory supported the development of each theme on a scale ranging from not at all (1) to strongly (5). Note that the themes were conceptualized according to Erikson's notion and thus were described by their two opposing tendencies (e.g., trust/mistrust). Hence, scores describe the extent to which a theme is included in the memory but not whether or how the conflict associated with a developmental theme was resolved. The instruction was:

In the following, we ask you to assess the extent to which the experience you mentioned contributed to the development of the aspects described below. We are not interested in whether the aspect was promoted in a beneficial (black) or detrimental (blue) way. It is only important whether it was promoted by this experience.

The stem statement for each developmental theme was: "To what extent did the reported event contribute to the development of [opposing tendencies of the developmental theme]". Then a more detailed description of the two opposing tendencies of each theme followed. To give an example, the developmental theme of trust versus mistrust was assessed as follows (see Appendix B for rating instructions of all developmental themes):

To what extent did the reported event contribute to the development of trust or mistrust against the world? For instance, through the experience that you were (not) cared for and protected, that your caregiver did (not) take care of you and that your personal needs have (not) been perceived.

In that case, the words in parentheses were blue because they described the "negative" tendency of mistrust. Each developmental theme was assessed through one item. In the following, for ease of presentation, we will refer to each developmental theme using the terms trust, identity, intimacy, and generativity. The

order in which event descriptions were presented was randomized.

2.2.3 Life satisfaction

We used the German version of the satisfaction with life scale (SWLS, Diener et al., 1985) by Glaesmer et al. (2011), which consists of five items (e.g., the conditions of my life are excellent). Participants indicated how much they agreed or disagreed with each of the five items using a 7-point scale that ranges from 7 (strongly agree) to 1 (strongly disagree). The five items were averaged to obtain one life satisfaction score for each person. The SWLS is a valid and reliable measure of life satisfaction (e.g., Glaesmer et al., 2011). Internal consistency (Cronbach's α) based on the present sample was estimated as $\alpha = .89$.

3 | RESULTS

3.1 Developmental themes and autobiographical memories

Instead of 112 (sample size) ×15 (number of important autobiographical memories) = 1680, there were 1574 memories as some participants were unable to recall 15 important autobiographical memories or due to missing values at the age at event rating or developmental themes ratings. Moreover, as the youngest participants were 61 years old, the following analysis included only those memories that occurred before participants were 61 years of age (see Glück and Bluck [2007] for a similar procedure and Conway and Holmes [2004] for using memories of the first six decades as well). This resulted in a total sample of 1426 autobiographical memories. Individual numbers ranged from 3 to 15 memories, with 88.4% of participants reporting ten or more memories.

At the time when the events took place, participants were 26.21 years of age (SD=15.40) on average. Of the 1426 important autobiographical memories, 395 (27.7%) fell in the period of childhood, whereas 538 (37.7%) and 493 (34.6%) fell in the youth and middle adulthood categories, respectively. Regarding the themes, we found the total number of memories to have ratings above average (trust: M=3.37, SD=1.35, identity: M=3.27, SD=1.35, intimacy: M=2.56, SD=1.51, generativity: M=2.84, SD=1.55). Average ratings varied across the three life periods. Trust showed the least variation between life periods, with a mean of 3.34 (SD=1.36) for childhood memories, 3.32 (SD=1.37) for memories from participants' youth, and 3.44 (SD=1.32) for memories



TABLE 1 Parameter estimates from multilevel multinomial regression models comparing memories from youth to memories from childhood and adulthood

	Comparing youth with							
	Childhood			Middle adulthood				
	Estimate	t	p	Estimate	t	p		
Intercept	-0.61	-2.84	.005	-0.20	-1.62	.107		
Age ^b	0.03	1.49	.138	-0.03	-2.59	.010		
Gender $(0 = female, 1 = male)$	0.04	0.14	.890	0.06	0.39	.699		
Trust ^w	0.33	4.34	<.001	0.05	0.73	.233		
Identity ^w	-0.19	-2.31	.011	-0.13	-1.77	.039		
Intimacy ^w	-0.23	-3.01	.002	0.04	0.63	.265		
Generativity ^w	-0.34	-4.81	<.001	0.21	3.41	<.001		

Note: between person-centered. within person-centered. For the effects of developmental themes, p values are presented one-tailed.

from middle adulthood. Mean ratings of identity were 2.90 (SD=1.39) in childhood, 3.40 (SD=1.29) in youth, and 3.44 (SD=1.33) in middle adulthood. Ratings of intimacy and generativity tend to increase across life periods, with childhood memories showing the lowest (intimacy: M=2.11, SD=1.32, generativity: M=2.23, SD=1.40), followed by memories from youth (intimacy: M=2.67, SD=1.50, generativity: M=2.86, SD=1.52), and middle adulthood (intimacy: M=2.82, SD=1.57; generativity: M=3.30, SD=1.52).

3.2 Developmental themes and their associations with different life periods

All analyses were conducted using IBM SPSS Statistics for Windows, Version 28 (IBM Corp, Armonk, N.Y., USA).⁴ We used a multilevel multinomial logistic regression (Hedeker, 2003; Hedeker & Gibbons, 2006; Stroup, 2013; Zimprich & Wolf, 2018) to compare memories from participants' childhood, the transition from youth to early adulthood, and middle adulthood. A multinomial logistic regression is an extension of the binary logistic regression and can be used when the dependent variable is nominal and consists of more than two categories. In the present study, category membership refers to the life period into which each autobiographical memory falls. More specifically, we examined the probability of memories falling into the period of childhood (i.e., 0 to 15 years), in the period of youth (i.e., 16 to 30 years), or the period of middle adulthood (31 to 60 years) and the variables, that change these probabilities (i.e., themes).

To account for the hierarchic structure of the data (up to 15 important memories nested in 112 participants), the multinomial logistic regression was extended to a *multilevel* multinomial logistic regression model with

memories representing Level 1 or the *within-person* level and participants representing Level 2 or the *between-person* level (see Zimprich & Wolf, 2018 for a more detailed description of the analytical approach). We first estimated two empty models without predictors to test for the non-independence of memories within a given person (Snijders & Bosker, 1999). The intraclass correlations were 0.23 for the childhood regression and 0.05 for the middle adulthood regression, indicating that, especially for the childhood, regression significant amounts of the total variance in memories were attributed to individuals (i.e., non-independence of a given person's memories).

In the next step, we entered the four themes as predictor variables, which were centered within person (group-mean centered). As control variables, we entered participants' age and gender. Age was centered between persons (grand-mean centered), and gender was dummy-coded with 0 (female) and 1 (male). To compare subsequent life periods, participants' youth served as the reference category. Based on the directional assumptions regarding the association between themes and life periods, *p* values for the effects of themes are presented one-tailed.

Parameter estimates are shown in Table 1. Regarding the comparison between memories from childhood and memories from youth, the effects of all themes were statistically significant. The effect of trust was 0.33, implying that the more an autobiographical memory was associated with themes of trust (compared to a person's individual mean), the greater the likelihood that this memory stems from participants' childhood years (OR: 1.39). Memories reflecting themes of identity (OR: 0.82), intimacy (OR: 0.79), and generativity (0.71), in contrast, are more likely to stem from participants' youth.

Turning to the comparison between youth and adulthood, the effect of generativity was strongest and statistically significant: Memories reflecting themes of

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generativity are more likely to stem from middle adulthood (OR: 1.22). The effect of identity was also statistically significant but negative. This implies that memories reflecting themes of identity are less likely to stem from middle adulthood (OR: 0.88) or, put differently, the developmental theme of identity is associated with memories from participants' youth.

To summarize, the results indicate that memories reflecting trust most likely stem from participants' childhood. Likewise, themes of identity are related to participants' youth. Memories reflecting generativity are most likely stemming from participants' middle adulthood and least likely from their childhood years. Hence, themes of generativity seem to increase from childhood to middle adulthood. Finally, memories reflecting intimacy are equally likely to stem from youth and middle adulthood but less likely to stem from participants' childhood years.

3.3 | Association between developmental themes and life satisfaction

We ran a hierarchical regression to examine how developmental themes represented in important autobiographical memories (i.e., the life story) are associated with a person's life satisfaction and whether this association depends on the emotional evaluation of the events. Life satisfaction was the continuous dependent variable. Emotional valence, each of the four themes, and their respective interactions were included as predictors. Note that predictor and control variables were included on the level of participants. To do so, we aggregated a mean score for each developmental theme and valence within participants (across memories).⁵ Predictor variables were then grandmean centered to calculate the interaction terms between developmental themes and valence. Control variables were also grand-mean centered apart from gender, which was entered dummy-coded with 0 (female) and 1 (male).

Memories were, on average, rated as emotionally more positive (M = 4.65, SD = 1.00). Regarding life satisfaction, the sample had a mean of 5.17 (SD = 1.06), indicating that participants were satisfied with their life on average. For descriptive statistics regarding the four themes on the person level, see Appendix C.

The four themes were positively related, and their correlations ranged between 0.64 and 0.79. This refers to 41.0% to 62.4% of shared variance, which indicates that they are strongly associated but not redundant, interchangeable constructs. Neither emotional valence nor life satisfaction correlated with the four themes. Emotional valence and life satisfaction also did not correlate (see Appendix C for the complete correlation table). However, our main hypothesis was that individuals with memories

having high ratings on the themes *and* high ratings on valence (i.e., more positive) have higher levels of life satisfaction. Correlations between the interaction term (i.e., emotional valence and developmental theme) and life satisfaction were all positive and significant with 0.34 (p < .01) for trust, 0.24 (p < .01) for identity, 0.25 (p < .01) for intimacy, and 0.24 (p < .01) for generativity.

Estimated regression effects of the hierarchical regression analysis for each theme are presented in Table 2 (Models 1 to 4). All hierarchical regression models included the same steps: first, the respective theme and emotional valence, as well as control variables age, and gender, were entered. In the second step, the interaction between the respective theme and emotional valence was added. Result patterns were similar for all four themes: As seen from Table 2, neither the single themes nor emotional valence had a significant effect on life satisfaction. The interaction effects between the respective theme and emotional valence, however, were positive and significant in all models implying that an individual who, on average, rates their memories as higher in representing a specific theme (i.e., above the sample mean) and as more positive (i.e., above the sample mean) shows a higher level of life satisfaction. To illustrate, Figure 1 displays the interaction effect between the theme of trust and emotional valence.

After including the interaction effect, explained variance increased by 9.0% (trust), 5.1% (identity), 4.6% (intimacy), and 4.3% (generativity). Taken together, our results largely supported the hypothesis that if individuals rated important memories as strongly reflecting the themes of trust, identity, intimacy, and generativity *and*, at the same time, perceived their memories as emotionally positive, they were more satisfied with their life.

4 DISCUSSION

According to Erikson's theory of psychosocial development (1959), trust, identity, intimacy, and generativity represent important themes individuals are confronted with during their life. The theory further posits that a positive engagement with these themes leads to healthy development and is related with general well-being, such as happiness and life satisfaction (e.g., Sneed et al., 2012). In the present study, we investigated whether important autobiographical memories—which are considered to reflect how a person has developed over time—refer to themes of trust, identity, intimacy, and generativity. Specifically, we examined whether the age at which events took place corresponds to the life period during which these themes are expected to be most dominant. In a second step, we tested whether individuals who rate their autobiographical memories (i.e., their life story) as high in reflecting themes



TABLE 2 The effect of single developmental themes on life satisfaction

	Step 1			Step 2		
	β	t		$\overline{\beta}$	t	p
Model 1						
Age	002	-0.021	.983	049	-0.515	.608
Sex	.121	1.222	.224	.084	0.881	.380
Trust	093	-0.947	.173	055	-0.584	.280
Valence	.108	1.079	.142	.066	0.684	.248
$Trust \times Valence$.312	3.209	.001
R^2		3.9%			12.8%	
Model 2						
Age	003	-0.031	.975	034	-0.354	.724
Sex	.126	1.270	.207	.099	1.017	.312
Identity	043	-0.434	.333	077	-0.798	.214
Valence	.097	0.972	.167	.092	0.939	.175
$Identity \times Valence$.233	2.365	.010
R^2		3.2%			8.3%	
Model 3						
Age	002	-0.017	.986	022	-0.223	.824
Sex	.125	1.252	.214	.107	1.086	.280
Intimacy	033	-0.330	.371	042	-0.439	.331
Valence	.099	0.991	.162	.088	0.896	.187
$Intimacy \times Valence$.217	2.230	.014
R^2		3.1%			7.7%	
Model 4						
Age	008	-0.084	.933	023	-0.233	.816
Sex	.137	1.371	.173	.121	1.234	.220
Generativity	.071	0.721	.237	.055	0.568	.286
Valence	.096	0.960	.170	.095	0.974	.167
$Generativity \times Valence$.209	2.161	.017
R^2		3.5%			7.8%	

Note: All developmental themes were centered between person. Presented p values are one-tailed for the effects of developmental themes, valence, and the respective interaction terms.

of trust, identity, intimacy, and/or generativity and, at the same time, rate their memories as emotionally more positive, show higher levels of life satisfaction.

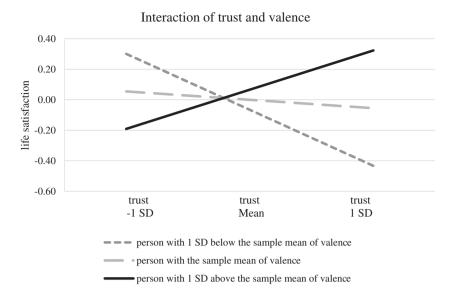
4.1 | Associations with life periods

Overall, the four themes were represented in important autobiographical memories. This is in line with theoretical notions of the Self-Memory System (Conway & Pleydell-Pearce, 2000), stating that once goal-relevant experiences remain accessible in memory at a later point in life and with previous studies investigating developmental themes in autobiographical memories (e.g., Conway & Holmes, 2004).

Regarding associations with age, the most robust effects were found for the themes of trust and generativity in that the ratings of both themes peak in the life periods that correspond to Erikson's developmental stages. Following Erikson's developmental theory (1959), infancy is assumed to be a period where individuals are confronted with the development of trust in others. One may argue that trust is most important during the first years of life, which are difficult to capture with autobiographical memories (e.g., Rubin, 2000). However, the development of trust is intertwined with the relationship with primary caregivers, such as one's parents. This relationship continues throughout childhood and shapes the development of trust until individuals become more independent. This is reflected in our data. Trust is more strongly related

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FIGURE 1 Illustration of the interaction effect of trust and emotional valence on life satisfaction. The interaction effect displayed is based on the standardized regression coefficients.



to childhood memories than youth memories. At the same time, levels of trust do not differ between memories from youth and middle adulthood, which both represent life periods in which individuals focus more on other social relationships, such as peers, life partners, and their children.

Themes of generativity, by contrast, are proposed to have their peak in the period of middle adulthood. This is supported by our finding that memories with higher generativity ratings are more likely to fall into the period of middle adulthood than of youth. We also found that memories with higher ratings of generativity are more likely to fall into the period of youth than of childhood which indicated that the theme of generativity emerges in youth and will continue to be relevant in middle age, where it is even more salient (Syed & McLean, 2018). This is in line with the assumption that generativity (e.g., community volunteering, environmentalism, work, or political involvement) may manifest already during adolescence (e.g., Lawford et al., 2005).

Regarding identity, the results also align with Erikson's developmental theory. We found that higher ratings of identity were associated with participants' youth. This equally held for the comparison with memories from childhood and memories from middle adulthood. Hence, the present findings support the assumption that youth and early adulthood are associated with establishing a clear sense of identity (Erikson, 1959). Notably, the effect was strong for the comparison between the life periods of childhood and youth and somewhat smaller for the comparison between youth and middle adulthood. This may indicate that identity development does not end abruptly but is still present in middle adulthood, though to a smaller extent. This aligns with Erikson's notion that identity development does not end with its formation but rather is an ongoing process (Hoare, 2002), although he did not provide detailed comments on this (Kroger, 2007). Moreover, important autobiographical memories—as used in the present study—include the most significant experiences of one's life and are assumed to be closely related to meaning-making processes and personal identity (e.g., Glück & Bluck, 2007). These experiences might not be limited to young adulthood. Rather, normative (e.g., marriage, children) and non-normative (e.g., divorce, job loss) experiences can lead to continued identity formation in middle adulthood (Syed & McLean, 2018).

Regarding intimacy, we found memories from participants' youth to be associated with higher intimacy ratings than childhood memories. In contrast, no difference was found between memories from participants' youth and middle adulthood. This indicates that the intimacy theme becomes more prevalent from childhood to youth, which is related to establishing an intimate relationship with a life partner and, notably, further extends through middle age. In middle adulthood, intimacy themes might involve less developing romantic relationships but rather refer to sustaining these relationships (Sneed et al., 2012). Whitbourne et al. (2009) also demonstrated that individuals who were not in a committed relationship early in adulthood showed a positive engagement with the intimacy theme in later adulthood, which further supports Erikson's view that developmental challenges are initiated as a particular point in time but can remain important or even re-arise at all points in the lifespan (Gilleard & Higgs, 2016).

4.2 Associations with life satisfaction

Following Wilt et al. (2010), we were also interested in whether autobiographical memories that reflect developmental themes are associated with a person's life satisfaction. The authors focused on trust and generativity, which

were combined into one overall score. We extend their research by investigating themes of identity and intimacy and focusing on each theme individually. In the present study, we found life satisfaction to be highest for those individuals who rated their memories not only high on developmental themes but also high on emotional positivity. Hence, it is neither the fact that memories refer to developmental themes nor simply the positive evaluation of memories that is related to life satisfaction but the interaction of both. From that, we conclude that the emotional evaluation of one's life story may reflect how well a person has met the challenges of developing trust, identity, intimacy, and/or generativity.

Regarding the single themes, the amount of explained variance is highest for of the interaction between valence and trust. Trust provides the security necessary for the child to interact with its environment. Forming the basis for interpersonal relationships in later years, the development of trust is critical for optimal development (e.g., resilience) across the lifespan (Luecken, 2000; Miller-Lewis et al., 2013; Svetina, 2014). Concerning identity and intimacy, we also found that reporting memories that are perceived as positive and are related to these themes had a positive effect on life satisfaction. This is in line with findings from Schiller (1998), indicating that accomplishing identity-related tasks (e.g., form a "Dream" and give it a place in the life structure or "externally and internally leave the family of origin" and "achieve physical, financial, and psychological autonomy from the family of origin") as well as intimacy-related tasks (e.g., form a love relationship) contribute to life satisfaction. Whereas the study of Schiller comprised younger adults of 28 years and their memories from the time between high school graduation and the late twenties, the present study shows that a positive engagement with themes of identity and intimacy is associated with life satisfaction even in old age. Similarly, having more positive memories and memories that reflect themes of generativity is also related to older adults' life satisfaction. Yet significant associations between generativity and well-being are investigated primarily for generative concerns assessed by questionnaires. Hence, we complemented previous research on the relation between relevant themes and psychosocial adaptation (i.e., health, resilience, and life satisfaction) by showing that individuals, who report important autobiographical memories that refer to themes of generativity and are rated as more positive, show higher levels of life satisfaction in older age.

4.3 | Limitations and future directions

First, we want to emphasize that Erikson's theory of psychosocial development is broad in scope and complex in detail. The present study does not claim to investigate the theory in its entirety but addresses the question of whether important autobiographical memories refer to age-related developmental themes and whether these memories are associated with personal well-being. In previous studies (Conway & Holmes, 2004; Wilt et al., 2010), memories were coded by trained coders so that each memory could only represent one developmental theme. In the present study, we used a different approach: We asked participants to rate the extent to which each memory referred to themes of trust, identity, intimacy, and generativity and their respective counterparts. Hence, each memory could refer to more than one developmental theme. This approach considers participants as experts of their own life who can assess the content of their memories best (Lind & Thomsen, 2018). As such, the present approach bypasses the methodological challenges associated with contentcoding, such as subjectivity and potential interpretive bias of the coders, identifying the segments that will be categorized, or replicability (e.g., Rourke et al., 2001). However, when participants rate memories themselves, this process can be subject to individual response tendencies. In the multilevel approach, we accounted for that by centering the predictor variables around the individual mean (i.e., group-mean centering). However, we cannot assure that responses made by participants reflect the developmental themes in the way that Erikson had described them. Hence, it would be beneficial to test the validity and reliability of our approach, for instance, by having multi-item scales to assess the studied developmental themes contained or by testing whether the participants' ratings are reliable across time (i.e., re-test reliability). Nevertheless, the present study presents a new approach to examine the association between important autobiographical memories, developmental themes, and life satisfaction. With our study, we hope to stimulate future research and a discourse about how to transfer Erikson's ideas to autobiographical memory research.

Regarding associations with life satisfaction, we considered the emotional evaluation of autobiographical memories as a proxy for how an individual dealt with the developmental themes represented in their memories (i.e., the life story). However, there may be alternative indicators. For instance, the impact or emotional interpretation of past events (i.e., their meaning) may be informative as well, particularly regarding associations with life satisfaction and well-being (Lilgendahl & McAdams, 2011). By connecting past events with one's development and the present self (i.e., autobiographical reasoning; Habermas & Bluck, 2000), individuals can draw meaning from their past and establish a sense of coherence across life (Habermas, 2011). Transferred to the present study, one might argue that a life story may

contribute to life satisfaction in old age when it describes an individual's development (i.e., developmental themes) in a meaningful and coherent way (see Adler et al., 2016 for a review). Given the complex and dynamic nature of human development, including additional aspects allows for further examining the relationship between important autobiographical memories (i.e., the life story), developmental themes, and life satisfaction in more detail.

Another limitation concerns the generalizability of our findings, which is limited to older adults. It is possible that a cohort of younger participants would show a different pattern of results. This might especially hold for the association between the developmental themes and age at memories because human development changes too, and the developmental stages proposed by Erikson might be relocated. For instance, Côté (2018) commented on changing cultural conditions, such as the observation of a delay in the transition to adulthood which prolongs identity themes for youth but may also lead to a shift in intimacy and generativity to later life periods. Our results show that themes of identity and intimacy are not only related to early adulthood but may also be reflected in important memories from middle adulthood. Related to that, future studies may seek to include more homogenous samples regarding age. By including participants between 61 and 91 years of age, the present study covers a comparatively broad age range. Consequently, we included the age of participants as a control variable in all our analyses. To meaningfully compare different age groups or age cohorts, a larger sample would have been needed that includes distinct age groups comparable in size.

5 CONCLUSION

Our findings show that asking for the most important autobiographical memories provides valuable insights into an individual's development. Important memories are one manifestation of an individual's life story (Köber & Habermas, 2017) and reflect how an individual became the person of today (Conway & Williams, 2008). The present study confirmed this assumption with respect to important developmental themes proposed by Erikson (1959). We provide further evidence for the-yet underexaminedassociation between themes of trust, identity, intimacy and identity and age at memories (but see Conway & Holmes, 2004; Schiller, 1998; Wilt et al., 2010), in the sense that memories stemming from a particular life period reflect the theme that is associated with that period. Moreover, we found an association between the extent to which memories reflect developmental themes and life satisfaction. Notably, the latter held only if a person considered their memories as emotionally more positive,

on average. That is, a person's life story that is characterized by a healthy development, in the sense that memories refer to themes of development and memories that are considered positive, is related to advantageous psychosocial outcomes such as life satisfaction in older adulthood.

AUTHOR CONTRIBUTIONS

All authors were involved in the conceptualization of the study design and final drafting. Lisa Nusser and Tabea Wolf jointly conceptualized the research question and drafted the manuscript. Tabea Wolf and Lisa Nusser conducted the analyses under the supervision of Daniel Zimprich.

ACKNOWLEDGMENTS

We are grateful to all the research assistants and participants who were part of this study and made the present analyses possible. Open Access funding enabled and organized by Projekt DEAL.

FUNDING INFORMATION

This article was not supported by any grant funding (intramural or extramural).

CONFLICT OF INTEREST

The authors do not have any financial or other conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings were deposited on (https://data.mendeley.com/datasets/sd3df Mendeley 9x772/1).

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ENDNOTES

¹ An anonymous reviewer asked for a more comprehensive description of Erikson's theory and for the reason of not including all eight stages. First, we need to acknowledge that we cannot present Erikson's theory in full because it is broad scope and complex in detail. Second, when focusing on the recall of (important) autobiographical memories, one has to keep in mind that these memories are not evenly distributed across a person's lifespan. For example, memories from an early age are rarely recollected (e.g., Rubin, 2000). Consequently, it is difficult to meaningfully examine the first four of Erikson's stages, which all refer to childhood (cf. Conway & Holmes, 2004). In the present study, we focus on trust because there is some empirical evidence showing that memories from childhood and early adolescence refer to themes of trust (Wilt et al., 2010) and, second,

- that the development of trust can be considered important regarding the development of identity and intimacy (Seiffge-Krenke & Beyers, 2016).
- One participant did not provide their age. Therefore, for subsequent analysis, we replaced the missing value with the mean age of the sample.
- ³ Part of the data has recently been published with respect to order effects during recall (see Nusser et al., 2022).
- ⁴ SPSS syntax to replicate the analyses is available in Appendix D.
- ⁵ An anonymous reviewer suggested excluding participants having less than ten memories. This is particularly relevant for the second research question when memory ratings were aggregated within participants. We ran each hierarchical regression twice—with the complete sample and after excluding those participants who reported less than ten memories (N = 97), but the results remained the same.
- ⁶ Note that all analyses regarding associations with life satisfaction (descriptive statistics, correlations, and regressions) are based on N=107 participants because we excluded participants who reported a few memories only (i.e., less than seven memories) and those who did not fill out the SWLS.

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How to cite this article: Nusser, L., Zimprich, D., & Wolf, T. (2022). Themes of trust, identity, intimacy, and generativity in important autobiographical memories: Associations with life periods and life satisfaction. *Journal of Personality*, 00, 1–13. https://doi.org/10.1111/jopy.12786