Developmental Psychology

A Cross-Sectional Study Using Self-Defining Memories to Explore Personal Identity Throughout Adulthood

Alain Fritsch, Virginie Voltzenlogel, and Christine Cuervo-Lombard

Online First Publication, December 14, 2023. https://dx.doi.org/10.1037/dev0001611

AMERICAN PSYCHOLOGICAL ASSOCIATION

Developmental Psychology

ISSN: 0012-1649

https://doi.org/10.1037/dev0001611

A Cross-Sectional Study Using Self-Defining Memories to Explore Personal Identity Throughout Adulthood

Alain Fritsch[1, 2], Virginie Voltzenlogel[1, 2], and Christine Cuervo-Lombard[1, 2]

[1] Psychology Department, University of Toulouse 2 Jean-Jaurès

[2] Centre d'Études et de Recherches en Psychopathologie et Psychologie de la Santé (CERPPS, EA7411), University of Toulouse 2 Jean-Jaurès

Little research has examined changes in personal identity over different periods of adult development. The aim of the present cross-sectional study was to target these changes through the characterization of the main dimensions in self-defining memories (SDMs; thematic content, specificity, integrative meaning, tension, contamination/redemption, and emotion) and their interactions. Our final sample was composed of 652 healthy French adults aged from 18 to 97 years, divided into four age groups: young adults ($n = 163$, $M = 23.7$ years), middle-aged adults ($n = 135$, $M = 44.0$ years), young-old adults ($n = 178$, $M = 64.5$ years), and old-old adults ($n = 176$, $M = 79.6$ years). Participants were asked to recollect three SDMs. A similar pattern of thematic content was observed throughout adulthood, except for relationship narratives were more frequent in the two younger groups. The findings highlighted that specific and integrated SDMs decreased with age and that tension and contaminative sequences were the most frequent in young adults. Redemptive memories did not significantly differ whatever the age of participants. No clear positivity effect was observed with aging. Finally, an analysis of the correlations among the main SDMs' dimensions showed that specificity correlated positively with tension in young adults and integrative meaning with redemption in young and middle-aged participants. We found no significant correlation between specificity and integration in any age group. For the first time, this study sheds new light on lifelong identity adjustments.

Public Significance Statement

The current study explored the development of personal identity through the comparison of four French age groups of adults: young, middle-aged, young-old, and old-old. It provides insights into a few developmental trends of the self. Thus, we found that some characteristics of memories supporting the sense of identity and called self-defining memories are differently influenced by age.

Keywords: self-defining memories, identity, autobiographical memory, adulthood, lifespan

Autobiographical memory (AM) refers to the ability to travel back and forward in time mentally (Tulving, 2002). Thus, it allows us to remember past events that we have personally experienced during our life and also to project ourselves into the future. AM is unique to each individual and closely tied to the self and personal identity (Conway & Jobson, 2012). Personal identity is considered to emerge in late adolescence or early adulthood (e.g., McAdams & McLean, 2013) and to change during a person's entire life (e.g., P. B. Baltes et al., 1980) through the process of individuation. AM contains self-information that plays a critical role in creating a stable and enduring representation of our self over time (i.e., sense of being the same person during one's lifetime), but also in updating the self while maintaining continuity (Conway, 2005). Individuals create their identity through the internalized construction of stories about their life (McAdams, 2001). Specifically, they tell themselves and others who they are and how they became who they are now, but also who they think they will become in the future (McAdams & McLean, 2013). As they integrate new events and experiences during their life course, individuals revise their stories throughout adult life (e.g., Cierpka, 2012; Habermas & Bluck, 2000). McLean (2008)

Alain Fritsch https://orcid.org/0000-0003-4721-1182

The authors are grateful to their psychology students from the master's degree in gerontology who assisted in collecting the data. The authors declare no conflicts of interest.

Alain Fritsch served as lead for conceptualization, data curation, investigation, and writing–original draft, contributed equally to writing–review and editing, and served in a supporting role for methodology. Virginie Voltzenlogel served as lead for conceptualization, methodology, and supervision and served in a supporting role for writing–review and editing. Christine Cuervo-Lombard served as lead for conceptualization, methodology, and supervision and served in a supporting role for writing–review and editing.

Correspondence concerning this article should be addressed to Alain Fritsch, Centre d'Études et de Recherches en Psychopathologie et Psychologie de la Santé (CERPPS, EA7411), UFR Psychologie, Université de Toulouse 2 Jean-Jaurès, 5 allées Antonio Machado, 31058 Toulouse Cedex 9, France. Email: alain.fritsch@univ-tlse2.fr

compared the representation of self in young and older adults and highlighted that younger individuals build more their identity in terms of change and older individuals in terms of stability. Through their AMs, individuals try to create a coherent sense of identity and to maintain their psychological adaptation (McLean, 2008).

Many studies have examined personal identity through the construct of self-defining memories (SDMs). SDMs are highly salient and robust autobiographical narratives that are relevant to enduring goals and play a central role in one's identity (e.g., Singer et al., 2013). These memories are defined as vivid, repetitively remembered, linked to thematically similar memories, and emotionally intense at the time of retrieval (Singer & Salovey, 1993).

Main Dimensions of SDMs

The thematic content is the principal theme emphasized in the narrative. It may closely reflect personal identity through individual motives and expectancies, goals in life, or other complex cognitive–affective mechanisms (Blagov et al., 2022). The thematic content of each SDM was assessed in seven mutually exclusive categories following Thorne and McLean's manual for coding events (2001): life-threatening events (LTEs); recreation or exploration events; relationship events; achievement events; guilt or shame events; drug, alcohol, or tobacco use events; and nonclassifiable events (NCEs). LTEs involve risk to one's self or to others (death or severe illness, accident, serious assault or sexual abuse, etc.). Recreation or exploration events refer to narratives describing recreational activities such as leisure activities, hobbies, travel, sport, and festivities. Relationship events focus on interpersonal events (relations with peers, love, wedding, divorce, interpersonal conflict, etc.). Achievement events include references to one's own or others' effortful attempts at mastery or accomplishment, regardless of the outcome (success or failure). Guilt or shame events are events that involve a moral choice or one's doing right or wrong. Drug, alcohol, or tobacco events include events that refer to the use of drugs, alcohol, or tobacco for recreational or other purposes. Finally, NCEs are narratives that do not fit into the six categories above or that involve more than one category.

The most widely explored dimension in SDMs is specificity. A memory is considered as specific when: (a) it refers to a single event that occurred within a particular place and a particular day, eventually at a precise time; (b) the event had a brief duration (Singer & Blagov, 2000–2001). More precisely, a highly specific SDM is a rich narrative containing many sensory and spatiotemporal details and also illustrates singular experiences corresponding to particular actions, affects, images, or interactions with others (Blagov et al., 2022). Conversely, a nonspecific SDM may refer to similar repeated events that occurred over more than a day (over weeks or months) and are recalled in a single memory (Singer et al., 2007). In such a summarized SDM, no single event is described with enough sensory and spatiotemporal details to occur in a particular time. Finally, overgeneralized SDM is another nonspecific memory that refers to semantic or abstractive events that occurred in more than a day (Singer & Blagov, 2000–2001).

Integrative meaning is probably the most crucial dimension because it is engaged in identity development as it permits the construction of a life story thanks to the emergence of cognitive skills such as autobiographical reasoning from adolescence (Habermas & Bluck, 2000; McAdams, 2001). We decided to apply the term integrative meaning or integration to define different processes: a lesson learned about the self, someone else, or the world (Singer & Blagov, 2000–2001) or, more generally, a meaning made of the important events in one's life. Thus, an integrative SDM contains sequences that attribute meaning to the event described and conveys what this experience taught (the narrator describes: "I learned the lesson that…" or "from there, I became aware that…"). The description should not be a simple statement of a fact (e.g., "I lacked confidence"), but should refer to a degree of reflection and, for example, should specify how the event contributed to changing a personality trait or to seeing it in a different light. On the contrary, a nonintegrative SDM does not contain statements about what the past event taught the narrator about the self, someone else, or the world (Singer et al., 2007).

Tension is indicated by an explicit reference to discomfort, disagreement, or unease of any character during the narration of the SDM (Thorne et al., 2004). More precisely, tension is present in stressful experiences like mortality events, whereas leisure and exploration experiences are expected to illustrate very few tension sequences. In addition, relationship or achievement events should involve intermediate levels of tension between life-threatening and leisure events (Thorne et al., 2004).

Contamination refers to an explicit transformation, in the narration, from a positive to a negative emotion (McAdams et al., 2001). More precisely, the beginning of the narration should describe a positive state (e.g., a vacation period, a joyful relationship, a successful schooling), but this positive is followed, sometimes suddenly, by a negative or traumatic ending (e.g., a serious injury, a major conflict or a betrayal, a failed exam). In contrast to contamination, the concept of redemption illustrates the capacity of adaptation after negative experiences and is defined as an explicit transformation in the narrative from a demonstrably negative to a demonstrably positive affective state (McAdams et al., 2001). The SDM should first refer to clearly negative emotions (e.g., sadness, fear, anger) or pain and reflect a challenging experience as it should end with a positive situation illustrating a problem resolving, a lesson learned, or a stage of personal growth (McLean et al., 2020).

Finally, the affective response at the time of recollection has also been targeted in literature (Blagov & Singer, 2004; Cuervo-Lombard et al., 2021; Lardi et al., 2010; Singer et al., 2007). According to their definition (Singer & Moffitt, 1992), SDMs elicit strong positive or negative feelings and affects when recalled. In some previous studies (e.g., Blagov & Singer, 2004), a list of positive and negative emotions was presented to the participants who were asked to rate them after the recollection of the memory. More often, the emotional valence and intensity were assessed after the memory retrieval (e.g., Cuervo-Lombard et al., 2021) or the changes in affect consisting of the difference between the emotional level after the recollection and a baseline affect assessment (Lardi et al., 2010).

Dimensions of SDMs Throughout Adulthood

Different cognitive mechanisms explain how personal identity is slowly constructed and modified from the episodic information of memories: autobiographical reasoning especially through social interactions (McLean et al., 2007), redemptionand contamination (McAdams & McLean, 2013).

Only rare studies have been conducted to target and understand the evolution of personal identity, which can be realized through the comparison of the dimensions of SDMs at different ages of adulthood.

As early adulthood is the period of identity construction, several studies have explored SDMs in young adults (e.g., Blagov & Singer, 2004; Lardi et al., 2010; McLean & Thorne, 2003; Thorne et al., 2004). However, only two studies targeted old adults in comparison to young adults (Singer et al., 2007) or to middle-aged participants (Cuervo-Lombard et al., 2021), and only one compared these three age groups (Falzarano et al., 2019). Some differences have been observed when comparing the main dimensions of SDMs in adults at different ages. The main results reported in previous studies in healthy participants are displayed in Table 1.

Thematic Content

As indicated above, the thematic content of SDMs refers to categories reflecting the main goals in personal life like achievement events, interpersonal relationships, and leisure events and also illustrating LTEs (Thorne & McLean, 2001). Table 1 presents most previous studies and shows that, whatever the age of participants, 20%–25% of SDMs referred to LTEs. In accordance with studies comparing two age groups (Cuervo-Lombard et al., 2021; Singer et al., 2007), Falzarano et al. (2019) did not observe any significant differences between life-threatening SDMs in young, middle-aged, and older participants.

Concerning recreation or leisure events, the frequency ranged from 7.0% to 20.3% depending on the study (see Table 1). The comparisons between age groups highlighted contradictory findings. While Cuervo-Lombard et al. (2021) showed that older participants recalled significantly more SDMs referring to recreation or leisure than middle-aged ones, no differences were observed between groups in the two other studies (Falzarano et al., 2019; Singer et al., 2007).

As presented in Table 1, all the previous studies found that relationship events were the most important content in the SDMs of young and middle-aged participants (ranging from 26.7% to 45.0%). In older adults, the number of memories referring to this content was still high (20.3%–27.5%). Only one study found a significant difference with middle-aged participants reporting a higher number of SDMs characterized by relations than older participants (Cuervo-Lombard et al., 2021).

Table 1 shows that the number of achievement events was high in most of the previous studies (18.9%–38.7%) but with lower frequencies (12%–13%) found in some of the studies concerning emerging adults (Thorne & McLean, 2002; Thorne et al., 2004). Previous studies that compared this content at different ages did not find significant differences between the groups (Cuervo-Lombard et al., 2021; Falzarano et al., 2019; Singer et al., 2007).

Guilt or shame events and drug, alcohol, or tobacco use events were the least represented contents in the SDMs (see Table 1), and no effect of age on their frequencies was previously observed (Cuervo-Lombard et al., 2021; Falzarano et al., 2019; Singer et al., 2007).

Finally, the memories that did not refer to the above contents (NCEs) represented $<10\%$ of the SDMs.

Specificity

As presented in Table 1, in emerging adults (aged <22 years old), studies found that approximately three quarters of the SDMs were specific (Blagov & Singer, 2004; Blagov et al., 2022; Lardi et al., 2010; Singer et al., 2007), that is they described an event that occurred within particular place and time and lasted <24 hr (Singer & Blagov, 2000–2001). When considering samples of young participants with larger age ranges, however, the frequency of specific memories seemed to be lower (d'Argembeau et al., 2012). In middle-aged individuals, Cuervo-Lombard et al. (2021) found that less than half SDMs were specific and there was no significant difference with older adults. Finally, Singer et al. (2007) reported that older adults provided fewer specific memories than college students. Thus, considering previous research, specificity seemed to decrease with advancing age consistently with the well-known decline in the ability for episodic remembering between early and late adulthood.

Integrative Meaning

Studies exploring integrative meaning in SDMs, that is, the ability of the individuals to step back from the narrative to derive higher personal meaning or a life lesson (Blagov & Singer, 2004), showed contradictory results at different life stages (Table 1).

In some studies in young adults, about a quarter to a third of all SDMs were integrated (Blagov & Singer, 2004; Blagov et al., 2022; Singer et al., 2007; Thorne et al., 2004). Older adults recollected many more integrated SDMs (Singer et al., 2007). Opposite findings were reported in other studies where integrative meaning was found to be relatively high in early adulthood (d'Argembeau et al., 2012; Lardi et al., 2010; Lavallee et al., 2019). Moreover, Cuervo-Lombard et al. (2021) found integrative meaning was less observed in older adults compared to middle-aged adults. With a slightly different task, consisting in asking participants to recount personally significant positive and negative memories during a semidirective interview, Habermas et al. (2013) observed an increase in the search for meaning from adolescents to middle-aged adults but not beyond.

Tension

As presented in Table 1, three studies targeted tension sequences in SDMs, that is, a reference to unease, disagreement, or discomfort of any character in the narrative (Thorne et al., 2004), and they seemed to show that this dimension decreased throughout adulthood (Cuervo-Lombard et al., 2021; Lardi et al., 2010; Thorne et al., 2004). Tensed memories were found to be much higher in emerging adults (Lardi et al., 2010; Thorne et al., 2004) than in middle-aged participants (Cuervo-Lombard et al., 2021). The latter reported significantly more tensed SDMs than old participants (Cuervo-Lombard et al., 2021).

Contamination and Redemption

Table 1 shows that only three previous studies explored contamination or redemption in healthy adults' SDMs (Blagov et al., 2022; Cuervo-Lombard et al., 2021; Lardi et al., 2010), that is an explicit transformation, in the narratives, from a positive to a negative state or the opposite evolution (McAdams et al., 2001). They showed that contamination sequences were high in college students (Blagov et al., 2022; Lardi et al., 2010) but very low in midlife and later life (Cuervo-Lombard et al., 2021). Two of these studies reported that the frequency of redemptive SDMs seemed to decrease with age: it was relatively high in emerging adults (Lardi et al., 2010), lower in middle-aged adults, and even lower in older adults (Cuervo-Lombard et al., 2021). In contrast, Blagov et al. (2022) found that redemptive sequences in memories were low in young participants.

Table 1
Age Groups and Main Characteristics of the SDMs in Previous Studies

Characteristic	Thorne and McLean (2002)	Blagov and Singer (2004)	Thorne et al. (2004)	Singer et al. (2007)	Lardi et al. (2010)	d'Argembeau et al. (2012)	Lavallee et al. (2019)	Falzarano et al. (2019)			Cuervo-Lombard et al. (2021)		Blagov et al. (2022)
Age range	18–23	17–22	18–23	17–22	50–89	18–22	18–29	18–57	—	18–40	41–64	65–94	31–55	62–79	—
M_{age} (years)	19.6	18.8	19.5	18.9	64.6	20.6	21.0	32.0	26.8	31.9	54.9	71.1	42.4	70.7	19.8
Content															
LTEs (%)	22.0	—	24.0	20.5	21.0	16.0	23.0	—	—	26.7	23.7	22.6	19.8	11.4	—
Leisure events (%)	20.0	—	17.0	7.0	8.0	13.0	10.0	—	—	9.3	9.7	8.6	8.1	20.3	—
Relations (%)	40.0	30.7	44.0	34.0	27.5	33.0	32.0	—	—	26.7	20.4	23.7	45.0	20.3	26.0
Achievement (%)	12.0	22.5	13.0	23.0	32.0	28.0	30.0	—	—	22.7	36.6	38.7	18.9	23.5	41.0
Guilt/shame (%)	—	—	—	7.0	5.5	0	1.0	—	—	5.3	1.1	0	0.9	5.7	—
Drug, alcohol, etc. (%)	—	—	—	0.5	0	0	0	—	—	0	0	0	0.9	0.8	—
NCEs (%)	—	—	—	8.0	6.0	9.0	4.0	—	—	9.3	8.6	6.5	6.3	17.9	—
Specificity (%)	—	77.8	—	73.8	45.4	76.0	57.0	45.3	67.2	—	—	—	46.0	53.0	85.0
Integration (%)	—	29.3	23.0	24.6	45.8	57.0	42.7	38.3	45.0	—	—	—	47.7	28.0	29.0
Tension (%)	—	—	69.0	—	—	59.0	—	—	—	—	—	—	30.7	12.3	—
Contamination (%)	—	—	—	—	—	17.0	—	—	—	—	—	—	0.9	2.4	18.0
Redemption (%)	—	—	—	—	—	23.0	—	—	—	—	—	—	9.0	3.3	7.0

Note. SDMs = self-defining memories; LTEs = life-threatening events; NCEs = nonclassifiable events.

The original study by McAdams et al. (2001), including narrative interviews of adults from 35 to 65 years old ($M_{age} = 49.8$ years), established that turning point memories contained more redemption sequences than all other specific life events. These authors also highlighted that redemption was more frequent than contamination. When comparing young adults ($M_{age} = 19.0$ years) to older ones ($M_{age} = 71.9$ years), McLean and Lilgendahl (2008) did not find any age effect in the use of redemptive sequences in low- or even high-point memory narratives. Nevertheless, they showed that the use of redemption in emerging adults was positively correlated with the identity function of reminiscence. In a 3-year longitudinal study, Dunlop et al. (2016) recently explored the contaminative and redemptive stories exhibited by college participants who were asked to write 10 key narratives. Between the two waves of collection, they found that the number of contaminative stories increased in young students and decreased in college seniors whereas the frequency of redemptive narratives increased in freshmen and did not change in college seniors. Lastly, McAdams and McLean (2013) suggested that the mechanism of redemption was probably more frequent in the middle-age adult period where it served to sustain the hope or confidence that is needed to weather short-term setbacks.

Emotion

In line with the socioemotional selectivity theory developed by Carstensen et al. (1999), there is strong evidence that people rate their past experiences as less negative or even more positive as they get older (e.g., Gallo et al., 2011). As rated for emotion, it is well established that SDMs are more positive than negative (e.g., Blagov & Singer, 2004; Singer & Moffitt, 1992). Comparisons between groups of participants of different ages have been performed in some previous studies. Thus, Singer et al. (2007) showed that older adults recalled SDMs that were more positive and less negative than the college students' memories, while Cuervo-Lombard et al. (2021) found that older participants' SDMs also contained more positive emotion and less negative emotion than those of middle-aged adults. Another study found a similar mean rating for emotion in the SDMs of young adults in their 20s or 30s (d'Argembeau et al., 2012).

Interactions Among the Dimensions of the SDMs

Few studies have targeted interactions among the main SDMs' dimensions. Specificity was positively correlated to threat or LTE and negatively to achievement in college students (Blagov & Singer, 2004; Lardi et al., 2010). A negative correlation was reported between specificity and integrative meaning in young participants (Blagov & Singer, 2004; d'Argembeau et al., 2012; Lardi et al., 2010; Singer et al., 2007), but not in older participants (Singer et al., 2007). These results suggest that young adults develop autobiographical reasoning and convert their detailed specific SDMs into less specific integrated SDMs. Furthermore, in young adults, a positive correlation was found between integrative meaning and tension (Thorne et al., 2004) or redemption (Lardi et al., 2010). In addition, SDMs that referred to LTEs contained more tension, contamination, and redemption sequences (Lardi et al., 2010).

About the Present Study

Researchers have tended to collect SDMs data from adults of different ages, in particular, in college students. However, to date, there

are only a few lifespan studies focusing on the self (Fritsch et al., 2023b; McAdams & Olson, 2010). Because a person's life is always a work in progress incorporating new life experiences over time, it seems important to highlight potential changes in self over different periods of adult development. The aim of the current cross-sectional study was to extend previous studies on SDMs to improve our understanding of the complex development of the self. To the best of our knowledge, the present study is the first that explored the main dimensions (specificity, integration, tension, redemption, emotion, thematic content) of these salient memories through the comparison in large samples of participants over the entire adult lifespan. Indeed, Falzarano et al. (2019) compared young, middle-aged, and older adults, but each participant recollected only a single narrative and authors only explored SDMs' thematic contents. We chose to distinguish four age groups and divide old participants into two subgroups (young-old and old-old). Young-old participants are in transition from work life to retirement, whereas old-old participants were closer to the end of their lives. In line with the postulated discontinuity in the model of third versus fourth age (M. M. Baltes, 1998) that is important with regard to the healthy aging perspective, we expect some differences in young-old and old-old adults. Finally, a further important and new aspect of the current work is the analysis of the interactions among the main SDMs' dimensions.

Hypotheses

Main Dimensions of SDMs

First of all, considering thematic content, we expected that the frequency of memories referring to LTEs, leisure, and achievement would not vary across adulthood (Cuervo-Lombard et al., 2021; Falzarano et al., 2019; Singer et al., 2007). On the contrary, we hypothesized that relationship sequences would be less frequent in older adults' SDMs than in young participants' SDMs (Cuervo-Lombard et al., 2021). We expected the number of specific SDMs to be the highest in young adults (e.g., Blagov & Singer, 2004; Lardi et al., 2010) and the lowest in older adults (e.g., Singer et al., 2007). We also hypothesized that integrative meaning would decrease throughout adulthood (Cuervo-Lombard et al., 2021; Lardi et al., 2010). The same evolution was expected for tension, contamination, or redemption sequences (Cuervo-Lombard et al., 2021; Lardi et al., 2010). Concerning emotion, we predicted more positive emotional valence in old participants' memories than in those of middle-aged and young participants (e.g., Cuervo-Lombard et al., 2021; Singer et al., 2007). As no previous study compared SDMs' characteristics in young-old and old-old participants, we tested whether these patterns differed between these two old adult groups.

Correlations Among SDMs' Dimensions

We hypothesized that the specificity of SDMs would be negatively correlated with SDMs' integrative meaning in young adults (Blagov & Singer, 2004; d'Argembeau et al., 2012; Lardi et al., 2010; Singer et al., 2007) but not in other participants. We also predicted that integrative meaning would be related to tension (Thorne et al., 2004) and redemption (Lardi et al., 2010).

Method

Participants

All participants were French native speakers and were recruited from three sources. The majority of younger adults were psychology or other undergraduates of the University of Toulouse. Middle-aged adults were recruited by personal contacts, and older adults were recruited through announcements at community organizations, such as the local senior centers or clubs. None of the participants was financially compensated. Our final sample consisted of 652 adults ranging from 18 to 97 years, divided into four age groups like Wolf and Zimprich (2015): young adults ($n = 163$, $M = 23.7$ years, $SD = 3.3$), middle-aged adults ($n = 135$, $M = 44.0$ years, $SD = 8.9$), young-old adults ($n = 178$, $M = 64.5$ years, $SD = 2.8$), and old-old adults ($n = 176$, $M = 79.6$ years, $SD = 7.0$). Older adults had been selected by their age, according to the World Health Organization's agreed cutoff of this population (>60 years old). They were all retired and noninstitutionalized. Moreover, they were screened for global cognitive function using the mini-mental state examination (MMSE; Folstein et al., 1975); 44 of them were excluded from the study because they showed pathological cognitive functioning according to the thresholds defined by Hudon et al. (2009). We did not include participants who presented a pathological score for anxiety and/or depression disorders on the 14-item Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). Thus, neither of our groups suffered from anxiety or depressive disorders. Even if our old-old group presented a significantly higher score of depression than the younger adults (4.31 vs. 3.52, $p = .008$ with the Bonferroni correction), their score was not pathological. The sociodemographic and clinical characteristics of the four age groups (young, middle-aged, young-old, old-old) are reported in Table 2. All groups were matched for sex, $F(3, 648) = 1.72$, $p = .162$, but the young adults' group

Table 2
Sample Characteristics

Characteristic	Age group				p
	18–30	31–59	60–69	70–97	
Number of participants	163	135	178	176	.065
Age, *M* (*SD*)	23.7 (3.3)	44.0 (8.9)	64.5 (2.8)	79.6 (7.0)	<.001**
Females (%)	55.8	58.5	62.9	67.1	.162
Years of education, *M* (*SD*)	13.8 (2.0)	12.7 (2.5)	12.6 (2.9)	10.9 (3.4)	<.001**
Anxiety (HAD), *M* (*SD*)	5.8 (2.2)	6.6 (3.7)	5.7 (3.6)	6.0 (4.3)	.127
Depression (HAD), *M* (*SD*)	3.5 (2.2)	3.7 (2.6)	3.6 (2.1)	4.3 (2.5)	.045*
MMSE, *M* (*SD*)	—	—	28.9 (1.2)	27.6 (1.9)	<.001**

Note. HAD = Hospital Anxiety and Depression Scale; MMSE = Mini-Mental State Examination.
* $p < .05$. ** $p < .001$.

presented a higher educational level than the other three subsamples and the older age group a lower level, $F(3, 648) = 32.11$, $p < .001$.

Procedure

The present research was conducted in accordance with the Helsinki Declaration and was approved by the local ethics committee (CERNI No. 2019-143). Participants were individually interviewed in a quiet setting. The experiment was initially introduced verbally by informing participants that they would have to recall some important personal memories and that they would be asked to fill out written questionnaires. They were informed that identification and personal information would be coded for the confidentiality of the data collected. Before inclusion in the research, participants were asked to give their written informed consent.

Measures

All participants were asked to retrieve and write down three SDMs according to the self-defining memory task (Blagov & Singer, 2004; Singer & Moffitt, 1992). The questionnaire was introduced by an oral description and while listening to it, participants had, in front of them, a sheet of paper with a summary of the six characteristics of an SDM. To be considered as an SDM, a recollected memory should meet the following criteria: (a) the memory is at least 1 year old; (b) it is important for the subject and vividly represented; (c) it helps oneself and significant others to better understand who the subject is as a person; (d) it reflects an enduring theme or issue or refers to an unresolved conflict from one's life and is connected to other memories pertaining to similar themes; (e) it could be either a positive or a negative event; the only important aspect is that it generates strong feelings; and (f) it is a memory the subject has thought of many times and is familiar like a picture studied or a song learned by heart.

Thereafter, participants had to rate their emotions associated with each SDM at the time of recall on two 7-point Likert scales (from 0 = *not at all* to 6 = *extremely intense*), one for positive emotions and the other for negative emotions.

Scoring

All 1956 SDMs were coded by Alain Fritsch and 20% of them were scored by two independent raters (Alain Fritsch and Virginie Voltzenlogel or Christine-Vanessa Cuervo-Lombard). In the few cases where the ratings differed, differences were resolved by discussion among the raters. Finally, agreement (Cohen's κ) was determined for each dimension.

Content of SDMs. The thematic content refers to the categories defined by Thorne and McLean (2001): (a) LTEs; (b) recreation or exploration events; (c) relationship events; (d) achievement events; (e) guilt or shame events; (f) drug, alcohol, or tobacco use events; and (g) NCEs. Agreement between the raters was good for thematic content (Cohen's $\kappa = .87$).

Specificity. Each SDM was coded as specific (score = 1) or nonspecific (score = 0). The memory was considered specific if it contained at least a single event that happened at a unique place with a duration of <24 hr (Williams & Broadbent, 1986). It was considered nonspecific if it referred to a categorical event (repeated similar events) or an extended event (longer than 24 hr). Agreement between the raters was very good for specificity (Cohen's $\kappa = .96$).

Integrative Meaning. The presence or absence of integrative meaning in the memories was determined following Singer and Blagov's manual (2000–2001). An SDM was considered to be integrated (score = 1) if the subject stepped back from the description and gave a comment or statement indicating the personal meaning or significance of the event and what it revealed about himself or herself, someone else, or life in general. By contrast, an SDM was considered to be nonintegrated (score = 0) if it contained only the narration of an event without a meaning. Agreement between the raters was very good for integrative meaning (Cohen's $\kappa = .90$).

Tension. The presence (score = 1) or absence (score = 0) of tension was coded in each narrative (Thorne et al., 2004). The tension was defined as an explicit reference to disagreement, unease, or discomfort in the narrative. Agreement between the raters was very good for tension (Cohen's $\kappa = .91$).

Contamination and Redemption. Contamination and redemption sequences were defined following the Foley Center for the Study of Lives' manual (1998, 1999) and McAdams et al. (2001). They were coded as present (score = 1) or absent (score = 0). A redemptive event had to contain an explicit and clear transformation in the story from a really negative-affect state to a really positive-affect one. The negative state of the event had to be clear and explicit and had to change into a decidedly positive situation or produce a positive outcome of some kind. On the contrary, a contaminative event had to contain an explicit transformation in the memory narrative from a demonstrably positive affective state to a demonstrably negative affective state. Agreement between the raters was acceptable for contamination (Cohen's $\kappa = .76$) and good for redemption (Cohen's $\kappa = .88$).

Emotional Valence. The emotional valence of the SDMs was calculated with the numeral difference between the scores on the two 7-point Likert emotion scales (one for positive emotions and the other for negative emotions). For each SDM, we obtained a score ranging from −6 (*extremely negative emotion*) to +6 (*extremely positive emotion*).

Statistical Analysis

Analyses were performed using SPSS®. For normally distributed variables, we conducted a separate univariate analysis of covariance on each main SDM's dimension with age group as a between-subject factor and educational level (in years) as a covariate. Post hoc comparisons were used to determine significant differences between age groups. For the five nonnormal distributed variables (contamination; redemption; guilt or shame; drug, alcohol, or tobacco; NCEs), comparisons were performed with Kruskal–Wallis H tests and in case of significant differences, pairwise comparisons were performed using Mann–Whitney U tests. Results were considered to be significant at a level of $\alpha = .05$, and the Sidak correction was applied for multiple independent testing. To perform a more detailed exploration of the differences throughout adulthood, we compared the frequencies of the 1956 memories in the four age groups regarding their thematic content, and, for this purpose, we used Mann–Whitney U tests.

In addition, relationships between the memory variables were established in the four age groups separately between the main dimensions of the memories (specificity, integrative meaning, tension, contamination, redemption, and emotional value). Spearman correlations were calculated and were considered to be significant at $\alpha = .05$. The Bonferroni correction was applied for multiple interdependent testing.

Results

Table 3 presents the mean characteristics of the SDMs' dimensions, the results of the different analyses of covariance, and the significant differences between the groups. The Sidak correction was applied for multiple independent testing, and we considered results with $p < .008$ as statistically significant. As no gender differences were found in the main dimensions of SDMs ($ps > .05$), data were collapsed across men and women.

Thematic Contents

No significant age differences were found for five of the thematic contents rated in the SDMs: LTEs, leisure or exploration, achievement, guilt or shame, and drug, alcohol, or tobacco abuse. The percentage of only two contents varied with respect to adults' age: relationship and nonclassified events. Relationship SDMs were found to be the most frequent in early adulthood (18–30 years) and midlife (31–59 years) before decreasing. Thus, the young adults and the middle-aged participants recollected more relationship sequences than the young-old group (both $ps < .001$) and the old-old group (respectively, $p < .001$ and $p = .001$). There were no significant differences between young and middle-aged adults ($p = .707$) and between young-old and old-old adults ($p = .304$). The opposite finding was observed for nonclassified events, as the frequency of NCEs increased throughout adulthood. The young adults' group reported fewer nonclassified SDMs than the young-old ($U = 12{,}740.5$, $p = .028$) and the old-old group ($U = 11{,}842.5$, $p = .002$), and the middle-aged group reported fewer nonclassified events than the young-old group ($U = 9{,}742$, $p = .001$) and the old-old group ($U = 9{,}036.5$, $p < .001$). Other differences were not significant ($ps > .05$).

Specificity

Specificity decreased throughout adulthood with the young adults group (18–30 years) reporting more specific SDMs than the young-old group ($p = .005$) and the old-old group ($p < .001$). Considering thematic content, we found that more LTE memories were specific in young adults (83.9%) than in young-old adults (59.6%; $U = 3{,}840$, $p < .001$) and in old-old adults (57.0%; $U = 3{,}639$, $p < .001$). This significant difference was also observed in middle-aged adults (72.7%) compared to old-old adults ($U = 3{,}968$, $p = .023$). In addition, middle-aged adults reported more specific achievement SDMs (63.9%) than young-old adults (42.9%; $U = 2{,}022$, $p = .012$) and old-old adults (44.1%; $U = 1{,}663$, $p = .025$). All other differences were not significant ($ps > .05$).

Integration

The percentage of integrated SDMs was lower in old-old adults than in young adults ($p = .003$) and in middle-aged adults ($p < .001$). Furthermore, compared with the young-old group, the middle-aged group reported more integrated SDMs ($p = .001$). Middle-aged participants provided the highest percentage of integrated SDMs but that percentage was not significantly different from young adults' integrated memories ($p = .207$).

SDMs containing life-threatening sequences were more often integrated in young adults (39.8%) and in middle-aged adults (51.1%) than in young-old adults (26.6%; $U = 4{,}400.5$, $p = .047$ and $U = 3{,}619.5$, $p < .001$, respectively) and in old-old adults (22.4%; $U = 4{,}112$, $p = .008$ and $U = 3{,}356.5$, $p < .001$, respectively). In addition, old-old adults reported fewer integrative leisure SDMs than the other three groups (14.9% vs. 28.3%, 27.5%, and 26.3%, all $ps < .05$). Finally, relationship SDMs were more often integrated in young adults (49.4%) than in young-old adults (34.0%; $U = 6{,}405.5$, $p = .017$) and in old-old adults (32.2%; $U = 7{,}625$, $p = .004$), and in middle-aged adults (46.9%) than in old-old adults ($U = 6{,}444$, $p = .019$). For thematic content, all other differences were not significant ($ps > .05$).

Tension, Contamination, and Redemption

Percentage of SDMs with tension was higher in young adults than in young-old and old-old adults (both $ps < .001$) but did not differ

Table 3
Mean Characteristics of the SDMs for the Four Age Groups and Effect of Age (ANCOVA or Kruskal–Wallis Tests)

Characteristic	*M* (*SD*)				Statistics
	Y	M	YO	OO	
Thematic content					
LTEs (%)	18.9 (25.1)	21.7 (23.2)	20.4 (23.3)	20.3 (22.8)	$F(3, 646) = 0.35$; $p = .790$; $\eta^2 = 0.00$
Leisure, exploration (%)	18.7 (23.7)	17.0 (23.7)	22.1 (27.0)	17.8 (25.4)	$F(3, 646) = 1.25$; $p = .290$; $\eta^2 = 0.01$
Relationship (%)	32.1 (28.8)	31.6 (29.5)	18.2 (23.0)	22.4 (28.6)	**$F(3, 646) = 11.25$; $p < .001$*; $\eta^2 = 0.05$**
Achievement (%)	11.5 (17.9)	15.1 (21.4)	15.9 (21.3)	12.9 (21.3)	$F(3, 646) = 1.59$; $p < .191$; $\eta^2 = 0.01$
Guilt, shame (%)	3.1 (10.3)	1.5 (6.9)	2.3 (9.8)	2.7 (10.4)	$H(3) = 2.37$; $p = .499$
Drug, alcohol, tobacco (%)	0.4 (3.6)	0.3 (2.9)	0.4 (3.5)	0.2 (2.5)	$H(3) = 0.54$; $p = .911$
NCEs (%)	15.2 (22.3)	12.8 (22.7)	21.0 (25.0)	25.0 (31.0)	**$H(3) = 22.19$; $p < .001$**
Specific SDMs (%)	63.6 (32.0)	57.8 (35.1)	52.3 (33.8)	47.5 (34.3)	**$F(3, 646) = 4.97$; $p = .002$; $\eta^2 = 0.02$**
Presence on integrative meaning (%)	38.9 (35.2)	42.7 (37.9)	29.4 (33.1)	23.5 (30.9)	**$F(3, 646) = 7.50$; $p < .001$*; $\eta^2 = 0.03$**
Presence of tension (%)	36.0 (30.7)	28.6 (28.0)	23.0 (27.0)	19.8 (22.7)	**$F(3, 646) = 8.66$; $p < .001$*; $\eta^2 = 0.04$**
Presence of contamination sequences (%)	11.1 (18.9)	3.7 (11.3)	6.6 (17.0)	6.4 (15.4)	**$H(3) = 19.09$; $p < .001$**
Presence of redemption sequences (%)	12.9 (20.4)	11.1 (19.5)	10.3 (19.4)	8.0 (16.7)	$H(3) = 6.24$; $p = .100$
Emotional value (/6)	1.72 (2.51)	2.18 (2.82)	2.76 (2.64)	2.11 (3.01)	**$F(3, 644) = 4.12$; $p = .007$*; $\eta^2 = 0.02$**

Note. The bold formatting corresponds to statistically significant results. Y = young adults (18–30 years); M = middle-aged adults (31–59 years); YO = young-old adults (61–69 years); OO = old-old adults (70–97 years); LTEs = life-threatening events; NCEs = nonclassifiable events; SDMs = self-defining memories; ANCOVA = analysis of covariance.
* p value corrected (<.008) using Sidak correction for multiple independent testing ($\alpha = .05$).

between the middle-aged, the young-old, and the old-old groups. Regarding thematic content, life-threatening SDMs present more tension sequences in young and middle-aged adults (respectively, 71.0% and 71.6%) than in young-old (47.7%; respectively, $U = 3{,}889.5$, $p = .001$ and $U = 3{,}650.5$, $p = .001$) and in old-old adults (48.6%; respectively, $U = 3{,}862.5$, $p = .001$ and $U = 3{,}625.5$, $p = .001$). In addition, the young adults reported more tensed SDMs containing relationship events (37.2%) than the young-old group (21.7%; $U = 6{,}391$, $p = .010$) and the old-old group (17.0%; $U = 7{,}342$, $p < .001$). Finally, in achievement memories, there were more often tension sequences in the young-old participants (25.9%) than in the old-old participants (11.8%; $U = 2{,}482$, $p = .029$).

Compared to other participants, the young adults reported SDMs that contained more contamination sequences than those of middle-aged adults ($U = 8{,}952$, $p < .001$), young-old adults ($U = 12{,}607.5$, $p = .004$), and old-old adults ($U = 12{,}599.5$, $p = .008$). The young group reported a higher percentage of contamination for LTEs (26.9%) than middle-aged (11.4%; $U = 3{,}457$, $p = .008$), young-old (14.7%; $U = 4{,}450$, $p = .032$), and old-old adults (15.0%; $U = 4{,}382$, $p = .038$); the young adults also reported more contaminative sequences than the middle-aged individuals in the SDMs with relationship events (10.9% vs. 1.6%; $U = 9{,}052$, $p = .002$).

The percentage of redemption sequences did not vary with age group (all $ps > .008$). However, in terms of relationship content, redemption was more frequent in young adults (16.0%) than in young-old adults (6.2%; $U = 6{,}821.5$, $p = .021$) and old-old adults (6.8%; $U = 8{,}353$, $p = .020$).

Considering tension, contamination, and redemption, all other differences were not significant ($ps > .05$).

Emotional Value

The young-old group reported SDMs with a higher emotional value compared to the young adult group ($p = .001$). None of the other mean comparisons reached the level of significance.

Considering thematic content and emotional value, significant differences were found for LTEs. The frequency of positive life-threatening SDMs was higher for young-old adults (30.6%) than for young adults (15.2%; $U = 4{,}206$, $p = .011$), middle-aged adults (14.8%; $U = 4{,}002$, $p = .010$), and old-old adults (17.8%; $U = 5{,}038.5$, $p = .029$). All other differences were not significant ($ps > .05$).

Correlations Among Main Dimensions

Correlations among the main SDMs' dimensions are set out in Table 4. The Bonferroni correction was applied for multiple interdependent testing, and we considered results with $p < .003$ as statistically significant. For every age group, few associations between specificity, integration, tension, redemption, contamination, and emotion were observed.

Specificity correlated positively with tension ($p = .002$) in the young adult group only (18–30 years). We also found that integrative meaning was positively linked with redemption in the young group ($p = .002$) and the middle-aged group (31–59 years; $p < .001$). Moreover, we found a positive association between tension and redemption in the middle-aged ($p < .001$) and young-old (60–69 years; $p = .001$) groups.

Table 4
Correlations (Spearman) and 95% Confidence Interval Between Main Dimensions of SDMs in the Four Age Groups

	Specificity			Integrative meaning			Tension			Contamination		
Characteristics	Y	M	YO	OO	Y	M	YO	OO	Y	M	YO	OO	Y	M	YO	OO
Integrative meaning	−.18 [−0.32, −0.03]	−.13 [−0.29, .04]	.05 [−0.10, 0.20]	.07 [−0.08, 0.22]			—									
Tension	**.24*** [0.09, 0.38]	.16 [−0.01, 0.32]	.15 [0.00, 0.29]	21 [0.06, 0.35]	.07 [−0.08, 0.22]	.17 [0.00, 0.33]	.11 [−0.04, 0.25]	.09 [−0.06, 0.23]			—					
Contamination	.12 [−0.03, 0.27]	.06 [−0.23, 0.11]	.15 [0.00, 0.29]	.05 [−0.10, 0.20]	−.01 [−0.16, 0.14]	−.07 [−0.24, 0.10]	.21 [0.06, 0.35]	−.03 [−0.18, 0.12]	**.27*** [0.12, 0.41]	.09 [−0.08, 0.26]	**.27*** [0.13, 0.40]	**.22*** [0.07, 0.36]				
Redemption	−.06 [−0.21, 0.09]	.04 [−0.13, 0.21]	−.06 [−0.21, 0.09]	.05 [−0.10, 0.20]	**.24*** [0.09, 0.38]	**.37*** [0.21, 0.51]	.03 [−0.12, 0.18]	.14 [−0.01, 0.28]	.09 [−0.06, 0.24]	**.32*** [0.16, 0.46]	**.24*** [0.10, 0.37]	.10 [−0.05, 0.24]	−.12 [−0.27, 0.03]	−.10 [−0.26, 0.07]	.00 [−0.15, 0.15]	−.12 [−0.26, 0.03]
Emotion value	−.02 [−0.17, 0.13]	.13 [−0.04, 0.29]	−.02 [−0.17, 0.13]	.03 [−0.12, 0.18]	.02 [−0.13, 0.17]	−.08 [−0.25, 0.09]	−.06 [−0.21, 0.09]	−.21 [−0.35, −0.06]	**−.47*** [−0.57, −0.34]	**−.49*** [−0.61, −0.35]	**−.47*** [−0.58, −0.35]	**−.30*** [−0.43, −0.16]	**−.40*** [−0.52, −0.26]	−.14 [−0.30, 0.03]	**−.31*** [−0.44, −0.17]	**−.30*** [−0.46, −0.16]

Note. The bold formatting corresponds to statistically significant results. Y = young adults (18–30 years); M = middle-aged adults (31–59 years); YO = young-old adults (60–69 years); OO = old-old adults (>69 years); SDMs = self-defining memories.
* p value corrected (<.003) using Bonferroni correction for multiple interdependent testing ($\alpha = .05$).

The strongest correlations were negative and observed between tension and emotional value in the young adult group, the middle-aged group, and the young-old group ($ps < .001$). In the old-old group (70–97 years), the negative link was found but was weaker ($p < .001$). We showed that contamination was strongly and negatively correlated with emotional value in the young adult group ($p < .001$). These two dimensions were moderately linked in the two older groups ($ps < .001$), but they were not correlated in the middle-aged one ($p = .11$). On the contrary, we found that redemption did not correlate with emotional value whatever the age group: in the young adult group ($\rho = .22$, 95% CI [0.07, 0.36], $p = .005$), in the middle-aged group ($\rho = .00$, [−0.17, 0.17], $p = .96$), in the young-old group ($\rho = -.07$, [−0.21, −0.08], $p = .18$), and in the old-old group ($\rho = .12$, [−0.03, 0.26], $p = .10$). Finally, we found that contamination and tension correlated whatever the age of the participants ($p < .001$, $p < .001$, and $p = .003$, respectively, in the young adult, young-old, and old-old groups) except in the middle-aged adults ($p = .31$).

Discussion

The aim of this cross-sectional study was to explore personal identity development by examining the evolution of SDMs throughout adulthood. To the best of our knowledge, this is the first time that these self-relevant memories have been investigated in a large sample. We compared the main dimensions of the SDMs and their relationships in four life periods: in young adults, middle-aged, young-old, and old-old individuals.

As no gender differences were found in the main dimensions of SDMs, data were collapsed across men and women. In line with previous studies (McLean, 2005; Pasupathi & Mansour, 2006), SDMs characteristics seemed not to be influenced by gender. However, Wood and Conway (2006) observed, in young adults, that negative valence and meaning-making were more present in women's SDMs than in men's SDMs.

Thematic Content

In the present study, we established that the frequency of SDMs did not vary with age for LTEs, leisure events, achievement events, guilt or shame events, and tobacco, drug, or alcohol use events. However, relationship events decreased and NCEs increased throughout adulthood, with young and middle-aged participants recollecting more relationship events and fewer NCEs than young-old and old-old adults. These results suggest that overall the same themes are present from emerging to older adults and that the current goals and concerns, reflected through these themes (e.g., Blagov & Singer, 2004), are highly consistent over time. This finding is congruent with a previous longitudinal life span study showing that life narratives, and to a lesser extent important memories, tend to level off from midlife (Köber & Habermas, 2017). This strong stability was also observed in a longitudinal study including six cohorts of participants, from 12 to 65 years (Camia & Habermas, 2020), who were asked to recall their most important memories and life narratives. Results showed that, whatever the age of the participants and compared to recent memories, older memories were more stable in their content, suggesting that after an initial phase of revision, the salient life story narratives reflect a stabilization of the self.

Nevertheless, we found that relationship events were more frequent in the narratives of young and middle-aged adults compared to older ones. This finding is congruent with previous studies on SDMs (Cuervo-Lombard et al., 2021) and life reviews (de Vries et al., 1995). We can argue that in young and middle-aged adults, the most important concern and a very salient characteristic of identity is the need for relationships with friends and building a family (Cuervo-Lombard et al., 2021; Lardi et al., 2010). Lastly, we found that NCEs were more frequently recollected in the old adults' SDMs than in the young adults' memories. This could be explained by the fact that older adults' SDMs are often composed of several events with more than one type of content.

Specificity

We found a similar percentage of specific SDMs to those previously reported in young adults (Blagov & Singer, 2004; d'Argembeau et al., 2012; Lardi et al., 2010; Singer et al., 2007) and in older adults (Cuervo-Lombard et al., 2021; Singer et al., 2007). In middle-aged adults, this percentage was higher in our study than in the only other study conducted on this age group but with a much smaller sample (Cuervo-Lombard et al., 2021).

As we hypothesized, the percentage of specific SDMs decreased throughout adulthood. In line with the only previous study comparing SDMs in young and older adults (Singer et al., 2007), we found that young participants recalled more specific memories than young-old and old-old participants. This finding is consistent with previous studies on AM, which have established that older adults recollected fewer episodic memories than younger adults (e.g., C. A. Holland et al., 2012). Indeed, semantization increases with the age of memories and the age of participants (Piolino et al., 2006).

Interestingly, when considering the content of the specific SDMs, we found that the memories containing LTEs were more specific in young adults than in young-old and old-old ones and in middle-aged than in old-old adults. It can be assumed that these events correspond to the SDMs with a high negative emotional response. Emotional arousal and personal involvement in an event seem to be two factors that have a large impact on the likelihood that a vivid memory can be maintained over time (A. C. Holland & Kensinger, 2010).

Integrative Meaning

As expected, we found that integrative meaning varied with age and tended to diminish with aging. Old-old participants recollected fewer integrated SDMs than young and middle-aged adults and young-old adults recalled fewer integrated SDMs than middle-aged adults. The percentage of integrated SDMs was the highest in the middle-aged group, but it did not differ significantly from the young adults. These results are in accordance with previous findings highlighting that the search for meaning increases between late adolescence and middle adulthood in narratives (Bluck & Gluck, 2004; Habermas et al., 2013; Pasupathi & Mansour, 2006). The decrease in integrative meaning found in the present study is congruent with another French study comparing SDMs in middle-aged and older adults (Cuervo-Lombard et al., 2021) but contrasts with Singer et al. (2007), who found that North American college students reported fewer integrated SDMs than older adults (24.6% vs. 76.3%). We assume that this inconsistent result could be explained by two main factors: firstly, the older participants in the American study had a higher educational level, and secondly, cultural differences may impact autobiographical reasoning through adulthood. We

argue that young or middle-aged adults explore their identity for change, personal understanding, and adaptation (Staudinger, 2001), whereas older adults need their self to be more stable and coherent (e.g., McLean, 2008), because they live more in the present instead of anticipating and projecting themselves in the future (McLean & Pratt, 2006). In a consistent way, compared to young participants, older ones are less likely to integrate their past and future into their life stories and to create a sense of unity and personal continuity through time (Habermas & Köber, 2015). This result could be explained, at least partially, by an impairment of executive functioning. Indeed, reduced executive functions in older adults are well known (MacPherson et al., 2002), and previous studies have shown that executive deficits may partially account for impaired meaning-making capacities in a clinical condition (Berna et al., 2011). Moreover, in old adults but not in young ones, autobiographical reasoning is found to be strongly linked to semantic verbal fluency (Raffard et al., 2020), suggesting that semantic ability is a salient component of integrative meaning only in older adults.

Interestingly, in congruence with a recent longitudinal study in college students (McLean et al., 2022) showing that change in autobiographical reasoning depended on the narrative domain (academics, romance) and the types of experiences, we found that the decreasing integrative meaning in SDMs observed through adulthood varied with the thematic content. The significant differences concerned LTEs (both young and middle-aged adults' SDMs were more integrated than those of young-old and old-old adults), relationships (the young adults provided more integrative meaning than young-old and old-old adults whereas the middle-aged recalled more integrative meaning than old-old adults only), and leisure events (the old-old group recollected fewer integrated SDMs than the other three groups). The prevalence of integrative meaning in LTEs and relationship events (Thorne et al., 2004) is not surprising and has already been highlighted in emerging and young adults' SDMs. More precisely, on the one hand, the search for meaning in relationship narratives would be crucial for the construction of identity through the processes of lesson learning and gaining insight (McLean & Thorne, 2003). On the other hand, the LTEs and the cognitive dissonance they produce constitute a disruption that generates enduring changes in interpersonal relations (Thorne & McLean, 2002). Thus, most frequent contents were found to have a strong impact on the self that arguably remains until midlife.

Tension, Contamination, and Redemption

In accordance with previous studies (Lardi et al., 2010; Thorne et al., 2004), we found that more than a third of young adults' SDMs contained tension sequences, confirming that some of these self-relevant memories are associated with enduring conflicts. Furthermore, we highlighted that the number of tensed SDMs decreased with age. This reduction of tension might be associated with the decrease we observed in integrative meaning. Compared to older groups, tensed SDMs were more frequent in young adults for LTEs and relationship events and in middle-aged adults for LTEs. This confirms that experiences representing interpersonal relations and vulnerability are crucial for the development of the self in young adulthood and to a lesser extent in middle age.

As expected, we found that the frequency of SDMs with contaminative sequences decreased throughout adulthood and that young adults recollected more contamination in their narratives than other adults. As for tension in memories, our findings provide new evidence that LTEs and conflicts in relations are experienced as highly difficult events by young individuals. On the contrary, middle-aged participants reported the lowest number of contaminative SDMs, in particular in relationship events, even if their frequency was not significantly different compared to young-old and old-old adults. A possible explanation is that midlife represents the time of maturity where identity is already robustly constructed and where individuals generally face a few bad experiences, such as bereavement over the death of parents and loved ones. Our findings are also in accordance with Dunlop et al.'s (2016) longitudinal study showing that young college students tend to construct more contaminative stories than seniors. These authors argue that young adults need to experiment with different identities and even a contaminative self before moving away from it in midlife.

Contrary to our initial hypothesis, we found that redemptive SDMs tend to decrease regularly, but not significantly, with age. This result is not that surprising considering that only four previous studies explored redemption in SDMs and that only one compared two age groups and found a significant difference between midlife and older age (Cuervo-Lombard et al., 2021). Other studies on memories that were not recalled from the SDMs task are in line with our findings. Thus, comparing young and older adults, McLean and Lilgendahl (2008) found no age effect on the number of their redemptive narratives. In their longitudinal study, Dunlop et al. (2016) established that freshmen reported an increasing frequency of redemptive narratives whereas the seniors' tendency to provide similar stories did not change. Despite the absence of an age effect on general redemptive SDMs, considering relationship events, young adults reported more redemptive memories than young-old and old-old adults. While redemption and contamination sequences are both narrative strategies for the construction of the self (McAdams, 2001), all these results suggest that when facing adversity, individuals, and particularly emerging adults who experienced conflictual relations, need to connect with a positive identity (McLean & Lilgendahl, 2008) and hope in a better future.

Emotional Value

We observed that young-old adults reported more positive SDMs compared to young adults. These findings are in accordance with a previous study comparing SDMs in young and older adults (Singer et al., 2007) and are presumably linked to an increasing access to positive memories or a decreasing access to negative ones. Compared to young and middle-aged adults, it can be argued that, in line with the socioemotional selectivity theory of aging (Carstensen et al., 1999), young-old adults are more focused on the regulation and satisfaction of their emotions in later life because they need to promote their more salient goals and concerns (Falzarano et al., 2019).

Correlations Among SDMs' Dimensions

Contrary to previous studies on young adults (Blagov & Singer, 2004; d'Argembeau et al., 2012; Lardi et al., 2010; Singer et al., 2007) and to our initial hypothesis, we did not find that specificity and integrative meaning were significantly negatively correlated in any of the groups. We assume that unlike the participants included in previous studies, our young participants had a more highly developed autobiographical reasoning whereas they still had high specific

SDMs. Then, from midlife on, people may have a large store of SDMs that in particular includes old summarized and recent specific narratives, both of them containing integrative assessments.

In line with previous work (Blagov & Singer, 2004; Lardi et al., 2010), in young adults, we found a positive correlation between the specificity and tension of the SDMs, assuming that negative events, like life-threatening narratives, are indeed better remembered in detail.

Unlike previous studies, we did not find a significant relationship between integrative meaning and tension (Lardi et al., 2010; Thorne et al., 2004) or conflict (McLean & Thorne, 2003). However, in the present study, integrative meaning correlated positively with redemption in young and middle-aged adults, which is congruent with Lardi et al. (2010). A possible explanation is that the presence of tension potentially contributes to promoting change and adaptation through meaning-making (Thorne et al., 2004). Both contamination and redemption are linked to tension but, although people learn more from stressful negative experiences than from positive ones (Baumeister et al., 2001), only the change from a negative to a positive situation may improve autobiographical reasoning (McAdams, 2006). We observed that the positive link between integrative meaning and redemption only concerned individuals until midlife but not beyond. We can assume that, compared to young and middle-aged adults, older adults may have partly integrated their redemptive experiences so that their narratives contain redemptive sequences without integrative assessments.

Limitations

Although this study has been conducted on a large sample, several limitations need to be acknowledged. Firstly, our research is a cross-sectional comparison and therefore might confound the effects of age and cohort. Thus, it cannot be ruled out that part of the observed age group differences may be due to differences in the cohort, especially given the profound social and societal changes that have occurred in the past century. This limitation can be addressed ideally with a longitudinal study of intraindividual changes or, more feasible, with a cohort-sequential design (e.g., Köber & Habermas, 2017), which permits the estimation of cohort effects. Secondly, we used no random sampling. Thus, our sample might not be representative of the French population for some demographic data such as sex ratio or sociocultural level, so that our results cannot be directly extrapolated to the entire population. Thirdly, we did not assess executive functioning in our participants. El Haj and Gallouj (2019) demonstrated that updating (but not shifting and inhibition) is positively correlated with the capacity to produce SDMs in normal aging.

Conclusion

The construction and preservation of the coherence of the self across the adult lifespan are generally perceived as one of the core functions of AM (e.g., Conway, 2005). Our cross-sectional study comparing young, middle-aged, young-old, and old-old adults provides insights into a few developmental trends of the self. Thus, we highlighted that some SDMs' characteristics are differently influenced by age.

The personal identity of young adults is represented by the predominance of a large number of specific SDMs, which concern in particular memories containing tension sequences such as LTEs. These individuals reported integrative narratives and developed different narrative strategies so that their SDMs are very rich in tension, contamination, and redemption. Two main contents seem to be highly salient for the development of their self: LTEs and relationship events. The development of identity is still high in midlife and characterized by very specific and integrated SDMs with autobiographical reasoning associated with redemptive processes. Relationships and achievement events are frequent or detailed in these memories. Middle-aged individuals recalled frequent tension sequences in their LTEs but, compared to young adults, fewer contaminative memories. Even if the SDMs in young-old adults are mostly specific, they are lower in integrative meaning than in young and middle-aged adults. At this stage of life, the emotional value of memories is the highest, thanks to a positive cognitive bias. Relationship events feature less prominently in the narrative content. Interestingly, we did not observe differences between young-old and old-old adults suggesting stable personal identity in aging.

In conclusion, our findings provide interesting knowledge of the self at different ages of life and, in particular, help to characterize identity in healthy older adults to support successful aging.

Future research could examine the impact on the self of other individual variables such as personality, psychological adjustment, or well-being. Indeed, Blagov et al. (2022) linked personality traits and psychological adjustment to some SDMs' dimensions, but they targeted only in young adults. Besides, self-esteem was positively correlated with the integrative meaning of self-defining future projections (Fritsch et al., 2023a). More generally, well-being is linked to important life experiences (Liao et al., 2021) and is one condition for experiencing successful aging (Teater & Chonody, 2020).

References

Baltes, M. M. (1998). The psychology of the oldest-old: The fourth age. *Current Opinion in Psychiatry*, *11*(4), 411–415. https://doi.org/10.1097/00001504-199807000-00009

Baltes, P. B., Cornelius, S. W., Spiro, A., Nesselroade, J. R., & Willis, S. L. (1980). Integration versus differentiation of fluid/crystallized intelligence in old age. *Developmental Psychology*, *16*(6), 625–635. https://doi.org/10.1037/0012-1649.16.6.625

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*(4), 323–370. https://doi.org/10.1037/1089-2680.5.4.323

Berna, F., Bennouna-Greene, M., Potheegadoo, J., Verry, P., Conway, M. A., & Danion, J. M. (2011). Impaired ability to give a meaning to personally significant events in patients with schizophrenia. *Consciousness and Cognition*, *20*(3), 703–711. https://doi.org/10.1016/j.concog.2010.12.004

Blagov, P. S., & Singer, J. A. (2004). Four dimensions of self-defining memories (specificity, meaning, content, and affect) and their relationships to self-restraint, distress, and repressive defensiveness. *Journal of Personality*, *72*(3), 481–511. https://doi.org/10.1111/j.0022-3506.2004.00270.x

Blagov, P. S., Singer, J. A., Oost, K. M., & Goodman, J. A. (2022). Self-defining memories—Narrative features in relation to adaptive and maladaptive personality traits (replication and extension of Blagov & Singer, 2004). *Journal of Personality*, *90*(3), 457–475. https://doi.org/10.1111/jopy.12677

Bluck, S., & Gluck, J. (2004). Making things better and learning a lesson: Experiencing wisdom across the lifespan. *Journal of Personality*, *72*(3), 543–572. https://doi.org/10.1111/j.0022-3506.2004.00272.x

Camia, C., & Habermas, T. (2020). Explaining change in content of life narratives over time. *Memory*, *28*(5), 655–668. https://doi.org/10.1080/09658211.2020.1761397

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, *54*(3), 165–181. https://doi.org/10.1037/0003-066X.54.3.165

Cierpka, A. (2012). Narrative identity in late adulthood. *Psychology of Language and Communication*, *16*(3), 237–252. https://doi.org/10.2478/v10057-012-0016-6

Conway, M. A. (2005). Memory and the self☆. *Journal of Memory and Language*, *53*(4), 594–628. https://doi.org/10.1016/j.jml.2005.08.005

Conway, M. A., & Jobson, L. (2012). On the nature of autobiographical memory. In D. Berntsen & D. C. Rubin (Eds.), *Understanding autobiographical memory: Theories and approaches* (pp. 54–69). Cambridge University Press.

Cuervo-Lombard, C., Raucher-Chéné, D., der Linden, M. V., & Voltzenlogel, V. (2021). Characteristics of self-defining memories in middle-aged and older adults. *Current Aging Science*, *14*(1), 39–45. https://doi.org/10.2174/1874609813666201006142514

D'Argembeau, A., Lardi, C., & Van der Linden, M. (2012). Self-defining future projections: Exploring the identity function of thinking about the future. *Memory*, *20*(2), 110–120. https://doi.org/10.1080/09658211.2011.647697

De Vries, B., Blando, J., & Walker, L. (1995). An exploratory analysis of the content and structure of the life review. In B. K. Haight & J. D. Webster (Eds.), *The art and science of reminiscing: Theory, research, methods, and applications* (pp. 123–137). Taylor & Francis.

Dunlop, W. L., Guo, J., & McAdams, D. P. (2016). The autobiographical author through time: Examining the degree of stability and change in redemptive and contaminated personal narratives. *Social Psychological and Personality Science*, *7*(5), 428–436. https://doi.org/10.1177/1948550616644654

El Haj, M., & Gallouj, K. (2019). Self-defining memories in normal aging. *Current Aging Science*, *12*(1), 43–48. https://doi.org/10.2174/1874609812666190429130052

Falzarano, F., Minahan, J., & Siedlecki, K. L. (2019). Age differences in the content of self-defining autobiographical memories. *New School Psychology Bulletin*, *16*(1), 15–24.

Foley Center for the Study of Lives. (1998). *Coding system for contamination sequences* [Unpublished manuscript]. Northwestern University.

Foley Center for the Study of Lives. (1999). *Coding narrative accounts of autobiographical scenes for redemption sequences* [Unpublished manuscript]. Northwestern University.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). Mini-mental state. *Journal of Psychiatric Research*, *12*(3), 189–198. https://doi.org/10.1016/0022-3956(75)90026-6

Fritsch, A., Voltzenlogel, V., & Cuervo-Lombard, C. (2023a). How do "young-old" adults project their self? A study of self-defining future projections in normal ageing. *Current Aging Science*, *16*(3), 199–210. https://doi.org/10.2174/1874609816666230330092556

Fritsch, A., Voltzenlogel, V., & Cuervo-Lombard, C. (2023b). Self-defining future projections throughout adulthood. *Imagination, Cognition and Personality*, *42*(4), 352–371. https://doi.org/10.1177/02762366221147849

Gallo, D. A., Korthauer, L. E., McDonough, I. M., Teshale, S., & Johnson, E. L. (2011). Age-related positivity effects and autobiographical memory detail: Evidence from a past/future source memory task. *Memory*, *19*(6), 641–652. https://doi.org/10.1080/09658211.2011.595723

Habermas, T., & Bluck, S. (2000). Getting a life: The emergence of the life story in adolescence. *Psychological Bulletin*, *126*(5), 748–769. https://doi.org/10.1037/0033-2909.126.5.748

Habermas, T., Diel, V., & Welzer, H. (2013). Lifespan trends of autobiographical remembering: Episodicity and search for meaning. *Consciousness and Cognition*, *22*(3), 1061–1073. https://doi.org/10.1016/j.concog.2013.07.010

Habermas, T., & Köber, C. (2015). Autobiographical reasoning in life narratives buffers the effect of biographical disruptions on the sense of self-continuity. *Memory*, *23*(5), 664–674. https://doi.org/10.1080/09658211.2014.920885

Holland, A. C., & Kensinger, E. A. (2010). Emotion and autobiographical memory. *Physics of Life Reviews*, *7*(1), 88–131. https://doi.org/10.1016/j.plrev.2010.01.006

Holland, C. A., Ridout, N., Walford, E., & Geraghty, J. (2012). Executive function and emotional focus in autobiographical memory specificity in older adults. *Memory*, *20*(8), 779–793. https://doi.org/10.1080/09658211.2012.703210

Hudon, C., Potvin, O., Turcotte, M.-C., D'Anjou, C., Dubé, M., Préville, M., & Brassard, J. (2009). Normalisation du *Mini-Mental State Examination* (MMSE) chez les Québécois francophones âgés de 65 ans et plus et résidant dans la communauté. *Canadian Journal on Aging/La Revue Canadienne Du Vieillissement*, *28*(4), 347–357. https://doi.org/10.1017/S0714980809990171

Köber, C., & Habermas, T. (2017). How stable is the personal past? Stability of most important autobiographical memories and life narratives across eight years in a life span sample. *Journal of Personality and Social Psychology*, *113*(4), 608–626. https://doi.org/10.1037/pspp0000145

Lardi, C., D'Argembeau, A., Chanal, J., Ghisletta, P., & Van der Linden, M. (2010). Further characterisation of self-defining memories in young adults: A study of a Swiss sample. *Memory*, *18*(3), 293–309. https://doi.org/10.1080/09658211003601522

Lavallee, A., Saloppé, X., Gandolphe, M.-C., Ott, L., Pham, T., & Nandrino, J.-L. (2019). What effort is required in retrieving self-defining memories? Specific autonomic responses for integrative and non-integrative memories. *PLoS One*, *14*(12), Article e0226009. https://doi.org/10.1371/journal.pone.0226009

Liao, H. W., Bluck, S., & Glück, J. (2021). Recalling youth: Control over reminiscence bump events predicts life satisfaction in midlife. *Psychology and Aging*, *36*(2), 232–240. https://doi.org/10.1037/pag0000592

MacPherson, S. E., Phillips, L. H., & Della Salla, S. (2002). Age, executive function, and social decision making: A dorsolateral prefrontal theory of cognitive aging. *Psychology and Aging*, *17*(4), 598–609. https://doi.org/10.1037/0882-7974.17.4.598

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

McAdams, D. P. (2006). The redemptive self: Generativity and the stories Americans live by. *Research in Human Development*, *3*(2–3), 81–100. https://doi.org/10.1080/15427609.2006.9683363

McAdams, D. P., & McLean, K. C. (2013). Narrative identity. *Current Directions in Psychological Science*, *22*(3), 233–238. https://doi.org/10.1177/0963721413475622

McAdams, D. P., & Olson, B. D. (2010). Personality development: Continuity and change over the life course. *Annual Review of Psychology*, *61*(1), 517–542. https://doi.org/10.1146/annurev.psych.093008.100507

McAdams, D. P., Reynolds, J., Lewis, M., Patten, A. H., & Bowman, P. J. (2001). When bad things turn good and good things turn bad: Sequences of redemption and contamination in life narrative and their relation to psychosocial adaptation in midlife adults and in students. *Personality and Social Psychology Bulletin*, *27*(4), 474–485. https://doi.org/10.1177/0146167201274008

McLean, K. C. (2005). Late adolescent identity development: Narrative meaning making and memory telling. *Developmental Psychology*, *41*(4), 683–691. https://doi.org/10.1037/0012-1649.41.4.683

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

McLean, K. C., Delker, B. C., Dunlop, W. L., Salton, R., & Syed, M.. (2020). Redemptive stories and those who tell them are preferred in the U.S. *Collabra: Psychology*, *6*(1), 40. https://doi.org/10.1525/collabra.369

McLean, K. C., Dunlap, D., Jennings, S. C., Litvitskiy, N. S., & Lilgendahl, J. P. (2022). Stability and change in autobiographical reasoning: A 4-year

longitudinal study of narrative identity development. *Journal of Personality*, *90*(3), 343–356. https://doi.org/10.1111/jopy.12669

McLean, K. C., & Lilgendahl, J. P. (2008). Why recall our highs and lows: Relations between memory functions, age, and well-being. *Memory*, *16*(7), 751–762. https://doi.org/10.1080/09658210802215385

McLean, K. C., Pasupathi, M., & Pals, J. L. (2007). Selves creating stories creating selves: A process model of self-development. *Personality and Social Psychology Review*, *11*(3), 262–278. https://doi.org/10.1177/1088868307301034

McLean, K. C., & Pratt, M. W. (2006). Life's little (and big) lessons: Identity statuses and meaning-making in the turning point narratives of emerging adults. *Developmental Psychology*, *42*(4), 714–722. https://doi.org/10.1037/0012-1649.42.4.714

McLean, K. C., & Thorne, A. (2003). Late adolescents' self-defining memories about relationships. *Developmental Psychology*, *39*(4), 635–645. https://doi.org/10.1037/0012-1649.39.4.635

Pasupathi, M., & Mansour, E. (2006). Adult age differences in autobiographical reasoning in narratives. *Developmental Psychology*, *42*(5), 798–808. https://doi.org/10.1037/0012-1649.42.5.798

Piolino, P., Desgranges, B., Clarys, D., Guillery-Girard, B., Taconnat, L., Isingrini, M., & Eustache, F. (2006). Autobiographical memory, autonoetic consciousness, and self-perspective in aging. *Psychology and Aging*, *21*(3), 510–525. https://doi.org/10.1037/0882-7974.21.3.510

Raffard, S., Bortolon, C., Iniesta, F., Macioce, V., Gely-Nargeot, M.-C., & Van der Linden, M. (2020). Projecting the self in ageing: An exploratory study of self-defining future projections. *Memory*, *28*(5), 632–641. https://doi.org/10.1080/09658211.2020.1753778

Singer, J., Rexhaj, B., & Baddeley, J. (2007). Older, wiser, and happier? Comparing older adults' and college students' self-defining memories. *Memory*, *15*(8), 886–898. https://doi.org/10.1080/09658210701754351

Singer, J. A., & Blagov, P. S. (2000–2001). *Classification system and scoring manual for self-defining autobiographical memories* [Unpublished manuscript]. Connecticut College.

Singer, J. A., Blagov, P. S., Berry, M., & Oost, K. M. (2013). Self-defining memories, scripts, and the life story: Narrative identity in personality and psychotherapy: Healthy narrative identity. *Journal of Personality*, *81*(6), 569–582. https://doi.org/10.1111/jopy.12005

Singer, J. A., & Moffitt, K. H. (1992). An experimental investigation of specificity and generality in memory narratives. *Imagination, Cognition and Personality*, *11*(3), 233–257. https://doi.org/10.2190/72A3-8UPY-GDB9-GX9K

Singer, J. A., & Salovey, P. (1993). *The remembered self: Emotion and memory in personality*. Free Press.

Staudinger, U. M. (2001). Life reflection: A social-cognitive analysis of life review. *Review of General Psychology*, *5*(2), 148–160. https://doi.org/10.1037/1089-2680.5.2.148

Teater, B., & Chonody, J. M. (2020). How do older adults define successful aging? A scoping review. *The International Journal of Aging and Human Development*, *91*(4), 599–625. https://doi.org/10.1177/0091415019871207

Thorne, A., & McLean, K. C. (2001). *Manual for coding events in self-defining memories* [Unpublished manuscript]. University of California, Santa Cruz.

Thorne, A., & McLean, K. C. (2002). Gendered reminiscence practices and self-definition in late adolescence. *Sex Roles*, *46*(9/10), 267–277. https://doi.org/10.1023/A:1020261211979

Thorne, A., McLean, K. C., & Lawrence, A. M. (2004). When remembering is not enough: Reflecting on self-defining memories in late adolescence. *Journal of Personality*, *72*(3), 513–542. https://doi.org/10.1111/j.0022-3506.2004.00271.x

Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, *53*(1), 1–25. https://doi.org/10.1146/annurev.psych.53.100901.135114

Williams, J. M., & Broadbent, K. (1986). Autobiographical memory in suicide attempters. *Journal of Abnormal Psychology*, *95*(2), 144–149. https://doi.org/10.1037/0021-843X.95.2.144

Wolf, T., & Zimprich, D. (2015). Differences in the use of autobiographical memory across the adult lifespan. *Memory*, *23*(8), 1238–1254. https://doi.org/10.1080/09658211.2014.971815

Wood, W., & Conway, M. (2006). Subjective impact, meaning making, and current and recalled emotions for self-defining memories. *Journal of Personality*, *74*(3), 811–846. https://doi.org/10.1111/j.1467-6494.2006.00393.x

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, *67*(6), 361–370. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x

Received July 18, 2022
Revision received June 8, 2023
Accepted July 4, 2023 ■