Natural Occurrence of Subjective Aging Experiences in Community-Dwelling Older Adults

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Objectives. The subjective experience of aging is a relevant correlate of developmental outcomes. However, traditional approaches fall short of capturing the inherent multidimensionality of subjective aging experiences (SAEs). Based on the concept of Awareness of Age-Related Change (AARC; Diehl, M. K., & Wahl, H.-W. (2010). Awareness of age-related change: Examination of a (mostly) unexplored concept. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 65*, 340–350. doi:10.1093/geronb/gbp110), this study provides a description of SAEs that is facet rich, and based on their natural occurrence, analyzes interindividual differences and associations with well-being.

Method. Data came from 225 participants (70–88 years) of the ongoing BEWOHNT study. Open-ended diary entries about age-related experiences were collected for more than 14 days and coded according to AARC domains and subdomains.

Results. Seventy percent of all participants had SAEs about physical functioning. About half of the sample reported experiences in the domains interpersonal relations, social-emotional and social-cognitive functioning (COGN-EMOT), and lifestyle. Thirty percent experienced aging in terms of changes in cognitive functioning. Contents of SAEs varied by gender, age group, and functional status. SAEs about COGN-EMOT were most consistently related to affective components of subjective well-being.

Discussion. Our results demonstrate the benefits of an open-ended approach to a multidimensional understanding of SAEs. Content-related, social-cognitive and social-emotional changes more than functional age-related changes were most important for well-being.

Key Words: Age identity—Life satisfaction—Positive and negative affect—Subjective experience of aging—Valuation of life—Well-being.

THE experience of passing (life)time is fundamental to the human condition. Individuals become consciously aware of the passing of personal lifetime through the age-related changes they notice. Despite certain regularities in age-related changes (e.g., graying of hair, social role changes), the personal experience of aging is highly subjective. First, there is a large degree of interindividual variability of developmental trajectories into old age (Baltes & Baltes, 1990). Second, individuals differ in terms of how much attention they pay to signs of aging (Montepare & Clements, 2001). Third, the tendency to causally attribute signs of aging to the aging process might differ among individuals (Levy, Ashman, & Slade, 2009). Behavioral and social scientists have reiterated the argument that chronological age is only a limited predictor of developmental changes and that more attention should be paid to the subjective experience of aging (Baars, 2007; Birren & Cunningham, 1985).

Since Neugarten, Moore, & Lowe (1965) presented their seminal work on how to "act one's age," the awareness of becoming older has developed into a growing field of gerontological research with several different empirical approaches. Frequently, the subjective experience of aging is studied in terms of subjective age (Kastenbaum, Derbin, Sabatini, & Artt, 1972). A second research tradition is the study of age stereotypes (Hummert, 2011), which affect functioning and health in old age through internalization as aging self-stereotypes (Levy, 2009). Further approaches address aging-related cognitions (e.g., Philadelphia Geriatric Center Morale Scale; Lawton, 1975; Personal Experience of Aging Questionnaire; Steverink, Westerhof, Bode, & Dittmann-Kohli, 2001). Importantly, these different empirical approaches show similar associations with a number of developmental outcomes, such as physical health (Levy, Slade, Murphy, & Gill, 2012; Stephan, Chalabaev, Kotter-Grühn, & Jaconelli, 2012; Wurm, Tesch-Römer, & Tomasik, 2007), cognitive functioning (Levy, Zonderman, Slade, & Ferrucci, 2012), and psychological well-being (Gana, Alaphilippe, & Bailly, 2004; Westerhof & Barrett, 2005).

Given these commonalities, researchers have begun to call for a more differentiated, domain-specific view of subjective aging experiences (SAEs; Diehl & Wahl, 2010; Hummert, 2011; Kornadt & Rothermund, 2011). Specifically, these authors argue that the self-evaluations of older people depend on contextual factors (e.g., life domains) and that implications of SAEs for behavior

regulation and experience differ by behavioral domain. Thus, one advantage of distinguishing between domains of SAEs is that it allows for a more detailed examination of their relationships with developmental outcomes, such as well-being. For example, seeing age-related losses in the domain of health and physical functioning as a normal and normative part of the aging process (Heckhausen, Dixon, & Baltes, 1989) could result in personal downgrading of their influence on subjective well-being. In contrast, age-related losses in other domains, such as feelings of control, might be more closely related to well-being.

Diehl and Wahl (2010) proposed five domains of behavior and functioning in which SAEs might primarily manifest. These domains are health and physical functioning (PHYS), cognitive functioning (COGN), interpersonal relations (RELSHP), social-cognitive and social-emotional functioning (COGN-EMOT), and lifestyle and engagement (ENGAGE). In following the Diehl and Wahl (2010) model, we purposefully decided to not link the dimensions of the model to specific age-related life events, such as retirement, financial concerns, or housing relocation. The rationale behind this approach was to keep the model at this stage of theoretical and empirical development as general as possible and avoid any linkage with circumscribed age periods (e.g., transition to retirement only refers to those in their sixties or early seventies). As shown in Table 1, this proposed taxonomy covers the broad range of aging experiences reported in qualitative and mixed-methods studies that examine the semantic space of SAEs quite well (Furstenberg, 2002; Giles, McIlrath, Mulac, & McCann, 2010; Karp, 1988; Keller, Leventhal, & Larson 1989; Lin, Hummert, & Harwood, 2004; Nilsson, Sarvimäki, & Ekman, 2000; Sherman, 1994; Steverink et al., 2001). Although these studies do not represent a systematic attempt to delineate the content of the five domains comprehensively in old-old adults, as it is the aim of this study, they provide support for the need to distinguish domains of SAEs. For example, despite unequivocally negative perceptions of aging in terms of health and physical functioning, individuals display quite different social-emotional and social-cognitive reactions (Furstenberg, 2002). Furthermore, focusing on domains other than PHYS might yield a more varied picture of gains and losses as they coexist in adulthood and old age (Karp, 1988).

In addition to their substantive content, aging experiences can be distinguished in terms of their reference points (Sherman, 1994). That is, it is also important to acknowledge that SAEs may derive from comparisons with other people and from comparisons with past or future states of the self.

Besides these important conceptual distinctions, this study is motivated by the desire to focus on naturally occurring events that create a personal awareness of aging. Recalls of SAEs for longer periods of time, as in the qualitative studies cited earlier, might be biased by preexisting schemata (Shiffman et al., 1997) or attitudes, such as age stereotypes, which have been shown to affect self-perceptions of aging (Kotter-Grühn & Hess, 2012). To overcome this problem, we employed a diary approach. The diary method (Bolger, Davis, & Rafaeli, 2003) captures SAEs close to the time of occurrence and thus minimizes that participants overreport stereotypical SAEs or underreport due to forgetting. Thus, the diary approach provides more accurate information regarding the frequency and relevance of SAEs in a person's everyday life. In addition, repeated sampling of SAEs over a longer interval, using an open-ended format, likely results in a more diverse and more accurate set of experiences for each individual. Furthermore, employing a daily diary approach allows investigating how naturally occurring SAEs relate to different components of subjective well-being. Previous research finds that affective compared with cognitive components of subjective well-being are more amenable to be influenced by situational factors. Of such situational factors, daily pleasures are more strongly linked with pleasant affect than with unpleasant affect, whereas daily troubles are more strongly linked with unpleasant affect than with pleasant affect (Diener, Suh, Lucas, & Smith, 1999). SAEs in everyday life, as an example of daily pleasures and stressors, might thus have consequences for affective well-being.

Finally, previous research has shown that there is considerable interindividual variation in SAEs (Giles et al., 2010). The most obvious factor that determines the experience of age-related events is age itself. With advancing age, health, independent living, and daily living routines become more fragile (Baltes, Maas, Wilms, Borchelt, & Little, 1999) and individuals tend to strive for emotion-regulation goals in social interaction (Carstensen, Isaacowitz, & Charles, 1999). Gender is another factor related to the experience of age-related change. Although men and women have similar subjective perceptions of their health, older women report higher levels of functional impairments than men (Arber & Cooper, 1999). This gender difference might carry over to SAEs in other domains such as social relationships, perceived control, and patterns of everyday activity. Further, low socioeconomic status is associated with poorer physical and functional health as well as lower levels of cognitive functioning (Wickrama, Mancini, Kwag, & Kwon, 2012), less support from non-kin ties (Broese van Groenou & van Tilburg, 2003), and engagement in fewer leisure and social activities (Jang, Choi, & Kim, 2009). Finally, functional health affects the possible scope of activities and social relationships as well as perceived control. Besides these differences in actual experience of age-related change, gender, age, socioeconomic status, and functional status are linked to interindividual differences in SAEs through personal beliefs about age and aging (Ryff, 1991; Timmer, Bode, & Dittmann-Kohli, 2003).

Table 1. Dimensions of Subjective Aging Experiences (SAES) in Previous Studies

Study characteristics		Dimensions of aging experiences according to the Diehl & Wahl (2010) model				
Author(s) Age range Sample size	Study focus	Health and physical functioning	Cognitive functioning	Interpersonal relations	Social-cognitive and social-emotional functioning	Lifestyle and engagement
Furstenberg (2002) 58–92 years $n = 26$	Qualitative interview on the course of aging	• Physical deterioration and decline	• Mental deterioration and decline • Internal development		• Emotional and behavioral responses to the signs of aging	• Unexpected continuation of activities • Positive shifts in activities
Giles and colleagues (2010) Middle-aged ($M = 49$) and elder adults ($M = 74$) $n = 380$	Occurrences that induce feeling one's own age, younger or older	• Physical decrements	• Mental decrements	• Family developments • Contact to younger individuals		• Reduced leisure and sporting activities
Karp (1988) 50–60 years $n = 72$	Signs of aging reported in an interview on occupational careers	• Changes in bodily experiences	• Wisdom	• Changes perceived in close others • Age-based expectations of others • Mortality reminders	• Changes of the meaning of time	• Enjoying the "empty nest"
Keller and colleagues (1989) 50–80 years $n = 32$	In-depths interviews on the "things" associated with aging	• Physical declines	• Slowing of cognitive capacity	• Changed social roles	• Changes of prevalent emotions	• Changes in social activities
Lin and colleagues (2004) Age range unknown $n = 550$	Age identities presented in an online forum for older adults	• Physical decline	• Maturity and wisdom	• Sense of loss	• Resistance of aging, mind-over-body attitude	• Continued active engagement • Freedom of age
Nilsson and colleagues (2000) 85–96 years $n = 8$	Reported occasions of feeling old in narrative life stories	• Physical change • Changed looks	• Change in mental qualities	• Being perceived old by others • Loss of same-aged peers	• Fear of helplessness and dependency	
Sherman (1994) 41–96 years $n = 101$	Interview on changes that led to feeling older	• Health	• Experience of a mature self	• Appraisals of others • Social role losses • Bereavement		
Steverink and colleagues (2001) 40–85 years $n = 4,034$	Confirmatory factor analysis; items derived from qualitative interviews on aging experiences	• Physical decline		• Social loss		• Continuous growth

Research Aims and Hypotheses

The main goal of this study was to examine domain-specific contents of SAEs in a natural setting by using a daily diary approach and to provide a comprehensive description of the contents, frequencies, and interdependencies of older adults' SAEs. We expected that individuals' self-reported SAEs would fall into the domains of PHYS, COGN, RELSHP, COGN-EMOT, and ENGAGE.

Because most age-related change ostensibly occurs in the domain PHYS, SAEs in this domain should be most common across individuals. Changes of bodily conditions were also expected to be related to increased levels of SAEs in other domains (RELSHP, COGN-EMOT, and ENGAGE). Given that adults associate aging with decline and loss (Heckhausen et al., 1989), we expected that SAEs would be predominantly negative, particularly in the domains PHYS and COGN. But, in light of the contents of SAEs that were identified in previous qualitative research, we expected to find gain-related experiences to be present within the domains of RELSHP, COGN, and ENGAGE.

Our second aim was to contribute to the explanation of interindividual variation in SAEs. In particular, we expected older individuals, women, socioeconomically disadvantaged, and functionally impaired individuals to report more negative SAEs over the course of the diary study.

Our third aim was to examine the association between SAEs and subjective well-being. Using a more fine-grained approach to the assessment of SAEs, we examined if effects on subjective well-being differ across behavioral domains and affective valence. Building on the notion of two separate emotion systems (Diener et al., 1999), we expected that positive SAEs would be related to pleasant affect and negative SAEs would be related to unpleasant affect. Furthermore, as SAEs were assessed in daily life, there should be a stronger association with affective than with cognitive components of subjective well-being.

Method

Study Design and Sample

Data were collected as part of the ongoing project "Here is my Home—The role of aging in place for healthy aging" (German abbreviation: BEWOHNT; detailed information on the research project can be obtained from Dr. Oswald or Dr. Kaspar.) conducted in the metropolitan area of Frankfurt, Germany. An important part of this project was a daily diary capturing naturally occurring SAEs for up to 17 days. The target sample size is 600 participants, stratified by age group (70–79 and 80–89 years old), household composition (living alone vs. living with partner), and city district (three typical urban neighborhoods in Frankfurt, Germany). This study is based on the first 225 participants. This sample size was adequate to provide comprehensive theoretical saturation for the qualitative data analyses and sufficient power for the statistical analyses.

Procedure

According to public registration records, the three city districts from which study participants were sampled contain a total of 9,605 community-living older adults aged between 70 and 89 years. However, since only single and partner households were included, and no prior information on household composition was available from official registers, this figure overestimates the study population. Based on potential participants for whom this information could be obtained, we estimate a response rate of 9.4% for all eligible individuals. This can be regarded as a lower bound because we only included one person from partner households in the study. Visual inspection of the spread of participants' residential location indicates that the study covers a representative segment of the targeted district population. Participants gave their informed consent to take part in the study and underwent the Dementia-Detection (DemTect) screening assessment (Kessler, Calabrese, Kalbe, & Berger, 2000). Cutoff scores of 12 and 8 were employed to exclude participants with mild cognitive impairment or dementia ($n = 6$). During a first face-to-face interview in the participant's home, the diary was handed out and detailed instructions for its use were given. After 17 days, a second face-to-face interview was conducted and completed diaries were collected. Ambiguous or incomplete diary entries were clarified in personal communication during the second interview. Both face-to-face interviews covered a wide range of psychological assessments, demographic characteristics, and personal evaluations of participants' living environment.

Measures

Subjective aging experiences.—One page of each daily diary was reserved for open-ended reports of SAEs. At the end of each day, participants were asked to reflect whether they experienced any events related to the five domains of behavior and functioning suggested by Diehl and Wahl (2010). Written answers were provided in an open-ended fashion using short sentences, keywords, or bullet lists and sorted into the five domains by the participants themselves. An additional unspecified category was given for SAEs that did not match these five domains. In designing this assessment procedure, we had decided against a completely open format because we expected that this would produce only restricted material on SAEs in terms of semantics and meaning. Instead, we offered the five domains of the AARC model as a guide for daily self-observation and provided a sixth fully open category to incorporate personal experiences that were not covered by the five domains.

Coding procedure.—To capture the diverse contents of SAEs within the five domains of behavior and functioning, a coding scheme with several subcategories was developed through a multistage procedure following directed

Table 2. Final Coding Scheme

Domain of behavior and functioning	Description
Health and physical functioning	
Physical sensations	Experienced states of the body; this includes sensations that might result from an illness (e.g., pain) if a causal condition was not mentioned
Muscle strength and physical endurance	Physical endurance, stamina, strength, including reports of activities that primarily require these qualities (e.g., carrying a bag of groceries)
Health and illnesses	Indications of specific illnesses or health conditions
Mobility	Physical agility, functionality of the mobility system, and balance, including reports of activities that primarily require these qualities (e.g., climbing a ladder)
Physical appearance	All outwardly visible body features (e.g., hair, skin, body posture, physical attractiveness)
Sensory functioning	Functioning of sensory organs (visual, auditory, somatosensory, gustatory, and olfactory systems), including accounts of activities that primarily require these qualities (e.g., driving in the dark)
Fine motor skills	Performance of small-scale motion sequences, which require (manual) dexterity, including reports of activities that primarily require these qualities (e.g., opening the closure of a necklace)
Other	Statements that do not fit into any of the health and physical functioning categories
Cognitive functioning	
Memory	Short- and long-term retention of information
Information processing	Cognitive processing speed, cognitive capacity, ability to coordinate and concentrate on information, spatial perception
Knowledge	Insights that became available with age; gaps in current knowledge
Other	Statements that do not fit into any of the cognitive functioning categories
Interpersonal relations	
Social support	Receipt or provision of social support, such as emotional, instrumental, and informational help (or a lack thereof)
Number, frequency, and type of contacts	Extent and intensity of social contacts; contact/interactions with people of specific role relationships (e.g., friends, grandchildren, neighbor), if contact and socializing is the dominating aspect of information
Sense of belonging	Sense of connectedness, belonging, relatedness or community with social interaction partners (or a lack thereof)
Expectations in social interaction	Expectations, ascriptions and attributions, reactions, and manners in social settings (both of others toward oneself and of oneself directed at others)
Other	Statements that do not fit into any of the interpersonal relations categories
Social-cognitive and social-emotional functioning	
Sense of control or dependency	Subjective perception of being capable to achieve personal goals by means of own efforts; being dependent on support of others
Self-esteem	Opinions, attitudes about, and valuation of one's own abilities and actions
Experience of time	A (changed) perception of past, current, or remaining lifetime; reflections on the passing of time; life review; thoughts about life and death
Motivational drive	(Lack of) motivation to do certain activities, desire/aversion to engage in particular activities, perceiving one's actions as meaningful, will to live
Joy or sadness	Inner feelings of happiness and enjoyment or sadness and depression in response to past, current, or expected events
Self-composure or anxiety	Inner state of calmness or disturbance and anxiety in response to past, current, or expected events
Other	Statements that do not fit into any of the social-cognitive and social-emotional functioning categories
Lifestyle and engagement	
Interests	Descriptions of the content of daily activities and daily routines or exceptional activities and hobbies
Time management	Accounts of temporal arrangements of daily schedule
Action scope	Geographic accessibility of certain locations, where daily activities are performed
Other	Statements that do not fit into any of the lifestyle and engagement categories

qualitative content analysis (Hsieh & Shannon, 2005). A preliminary coding scheme based on theoretical consideration was developed by the first author and applied to the data of 25 randomly selected participants. Further themes that emerged from these data were used to refine the coding scheme and to extract descriptions and example statements for each subcategory. After training in the use of the coding scheme, the same data were coded independently by a research assistant. Coding decisions of the two raters were compared, disagreements discussed, and definitions and coding guidelines further refined. Next, data of

the remaining 200 participants were coded and previously coded segments were reexamined if new subcategories emerged. The resulting coding scheme is shown in Table 2.

For coding purposes, each statement was segmented into meaningful idea units. Each idea unit was coded with regard to its domain of behavior or functioning, emotional valence, and reference point. The main categories representing the *behavioral and functional domains* (PHYS, COGN, RELSHP, COGN-EMOT, and ENGAGE) were divided into 23 subdomains (Table 2). A remainder category was created for each main domain to comprise statements that were

clearly related to the respective domain but too vague to be coded within any of the subdomains. If none of the five main domains was suitable, an idea unit was coded in a sixth category "other." The coding of behavioral and functional domains was performed irrespective of the category that had been assigned by the participant. The majority of SAEs was coded within the domain indicated by the participant (65%).

For *emotional valence*, the main categories were negative, positive, ambivalent, and not assessable. If emotional valence was not explicitly indicated by the participant, classification was based on judgments of the coders. *Reference points* were coded for social comparison (with age peers, younger, older, or unknown age groups) and/or temporal comparison (with past selves, future selves, or mere descriptions of current situation).

Twenty-nine diary entries from seven participants that had not been written by the participants (e.g., these entries were written in the third person), four diary entries from four participants in which they related SAEs to the research project, and three reports from three participants in which aging was explicitly excluded as a possible cause of the reported experience were dropped from further analyses, resulting in a total of 1,757 statements from which 2,897 idea units were derived. Interrater agreement was calculated from diary entries of 44 randomly selected participants (20%). Within the five domains of behavior and functioning interrater agreement ranged from $\kappa = 0.86$ for COGN-EMOT to $\kappa = 0.96$ for PHYS. Interrater agreement was also very satisfactory for emotional valence, $\kappa = 0.88$, social comparison, $\kappa = 0.82$, and temporal comparison, $\kappa = 0.89$.

Age group.—To compare SAEs by age group, two age groups were created at the cutoff point of 80 years. Contrasting the 70–79 year olds with those aged 80–89 years old permits the exploration of possible transitional dynamics associated with moving from the third age into the fourth age (Baltes & Smith, 1999).

Socioeconomic status.—Ten categories were provided to classify monthly household income (1 = no income, 10 = more than 5,000€). Educational attainment was measured according to the years of formal schooling, including vocational training and attendance of college/university. Median splits were conducted to group participants into groups with low (≤2,000€/month) and high income (>2000€/month), and low (<12 years) and high (≥12 years) educational attainment.

Functional health.—The function component of the abbreviated Late Life Function and Disability Instrument (SF-LLFDI; Denkinger, Weyerhäuser, Nikolaus, & Coll-Planas, 2009) was used to assess functional health. The SF-LLFDI function component is a self-report questionnaire, in which participants rate the extent of difficulties experienced in activities of daily life on a 5-point Likert scale (e.g., getting into and off the car). Cronbach's alpha

for this subscale was $\alpha = 0.90$. Individuals were grouped into a high or low functional status group based on a cutoff sum score of 56, which corresponds to no or minor impairments on all 14 activities of daily life.

Subjective well-being related measures.—Emotional well-being was assessed with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS provides 10 adjectives each for positive affect (PA; Cronbach's $\alpha = 0.81$) and negative affect (NA; Cronbach's $\alpha = 0.79$), which were rated on a 5-point Likert scale with reference to the past year. Life satisfaction (LS), cognitive component of subjective well-being was assessed with a single-item measure: "On the whole, how satisfied are you with your life?", which was rated on an 11-point scale (0 = absolutely dissatisfied; 10 = absolutely satisfied). The valuation of life (VOL) questionnaire (Lawton et al., 1999) was used to augment the range of outcome measures with a scale that captures more complex judgments of current life circumstances strongly related to a person's will to live (Cronbach's $\alpha = 0.81$). All measures were assessed before the diary was filled out, except for the PANAS, which was part of the second interview.

Data Analytic Strategy

For each participant, diary data were aggregated for the entire study period. Frequency distributions of these aggregated data were inspected for typical contents of SAEs. Next, we conducted chi square tests to analyze group differences of SAEs. Alpha level was set at 0.01 to control for the number of comparisons performed. In these analyses, SAEs were dichotomized as being reported or not reported within each domain and subdomain throughout the observation interval. Finally, multiple regression analyses were used to investigate associations between SAEs and subjective well-being related measures. In these analyses, SAEs were again aggregated over time for each participant and adjusted for the number of days the diary was kept.

RESULTS

Descriptive Findings

Participants were aged 70–88 years ($M = 77.1$, $SD = 5.0$) with a median monthly household income category of 2,400–3,000$ (equal to 2,000–2,500€) and an average level of education of 12.8 years of schooling ($SD = 4.0$ years); 57.8% of the sample were women.

The majority of participants (80%) kept their diary for at least 12 days with an average duration of 14 days ($SD = 4.1$ days). These participants reported SAEs on an average of 48% of the days (6.4 days, $SD = 4.3$ days). Within-person variation in the total number of SAEs reported on a given day amounted to 45.2% of the total variance and between-person variation accounted for 54.8%. A multilevel

Table 3. Relative Frequencies of Subjective Aging Experiences within Subdomains of Behavior and Functioning

Domain of behavior and functioning	Number of idea units	Participants (%)	Emotional valence (% of idea units)			Social comparison (% of idea units)			Temporal comparison (% of idea units)		
			Positive	Ambivalent	Negative	Younger	Same age	Older	Past	Current	Future
Health and physical functioning	**1,285**	**71.6**	**10.0**	**0.5**	**82.6**	**1.4**	**1.2**	**0.2**	**14.9**	**79.1**	**0.2**
Physical sensations	403	50.9	5.2	0.2	94.0	—	—	—	4.0	96.0	—
Muscle strength and physical endurance	343	48.2	15.2	0.3	81.0	3.8	1.5	0.6	31.5	62.7	0.6
Health and illnesses	257	38.7	11.7	1.2	84.0	—	3.1	0.4	7.4	89.9	0.4
Mobility	130	25.2	8.5	—	88.5	2.3	0.8	—	14.6	82.3	—
Physical appearance	38	9.0	18.4	2.6	55.3	2.6	—	—	36.8	60.5	—
Sensory functioning	26	8.1	7.7	—	92.3	—	—	—	30.8	69.2	—
Fine motor skills	21	3.6	—	—	90.5	—	—	—	9.5	90.5	—
Other	67	18.5	7.5	—	14.9	1.5	3.0	—	7.5	23.9	—
Cognitive functioning	**221**	**32.4**	**13.6**	**0.5**	**79.2**	**2.7**	**0.5**	**0.5**	**14.0**	**80.5**	**—**
Memory	154	23.4	5.8	0.6	91.6	—	—	—	9.7	90.3	—
Information processing	23	9.0	21.7	—	73.9	—	—	—	17.4	82.6	—
Knowledge	19	7.2	57.9	—	21.1	26.3	—	—	47.4	31.6	—
Other	25	8.6	20.0	—	52.0	4.0	4.0	4.0	12.0	56.0	—
Interpersonal relations	**408**	**45.5**	**31.9**	**28.7**	**21.6**	**3.2**	**0.7**	**0.2**	**5.6**	**87.5**	**—**
Social support	174	28.8	29.3	60.3	6.9	—	—	0.6	2.3	97.1	—
Number, frequency, and type of contacts	95	21.2	30.5	4.2	26.3	3.2	—	—	12.6	83.2	—
Sense of belonging	76	17.1	53.9	6.6	31.6	3.9	3.9	—	6.6	82.9	—
Expectations in social interaction	48	12.6	12.5	6.3	56.3	14.6	—	—	4.2	83.3	—
Other	15	6.8	20.0	—	—	—	—	—	—	40.0	—
Social-cognitive and social-emotional functioning	**524**	**51.4**	**43.2**	**4.4**	**40.0**	**2.1**	**1.9**	**0.6**	**23.5**	**62.9**	**5.9**
Sense of control or dependency	135	26.1	26.7	2.2	68.9	—	3.7	2.2	19.3	71.1	4.4
Self-esteem	108	25.7	88.9	0.9	8.3	2.8	1.9	—	39.8	52.8	2.8
Experience of time	87	19.4	16.3	12.8	29.1	8.1	1.2	—	31.4	47.7	11.6
Motivational drive	60	13.1	28.3	3.3	66.7	—	—	—	8.3	85.0	5.0
Joy or sadness	59	14.4	69.5	1.7	28.8	—	1.7	—	18.6	79.7	—
Self-composure or anxiety	51	13.1	43.1	9.8	43.1	2.0	2.0	—	19.6	60.8	17.6
Other	24	8.1	—	—	12.5	—	—	—	4.2	25.0	—
Lifestyle and engagement	**448**	**52.3**	**19.4**	**2.0**	**65.2**	**1.3**	**2.0**	**0.2**	**29.2**	**63.2**	**1.6**
Interests	318	45.0	23.0	2.2	61.9	1.3	2.2	0.3	26.7	68.6	1.9
Time management	59	14.4	6.8	3.4	88.1	3.4	—	—	49.2	47.5	—
Action scope	38	11.7	15.8	—	84.2	—	2.6	—	39.5	60.5	—
Other	33	8.6	12.1	—	33.3	—	3.0	—	6.1	42.4	3.0

model was estimated to model trends over the observation period showing a slight decrease in the total number of SAEs with each day of the observation period ($\beta = -0.04$, $SE = 0.01$, $p < .001$). For the majority of participants (68%), SAEs were multifaceted, covering at least three out of the five domains ($M = 2.5$, $SD = 1.7$) of behavior and functioning throughout the study. The average number of domains per participant and day, however, was considerably lower ($M = 0.88$, $SD = 0.76$).

Relative frequencies of subjective aging experiences.— Table 3 summarizes the absolute number of SAEs per domain and subdomain, percentages of participants reporting a SAE in each domain and subdomain at least once during the observation period, and distributions of valences and reference points. The majority of participants (71.6%) mentioned SAEs in the domains of PHYS. Approximately half of the sample had SAEs related to ENGAGE, COGN-EMOT, and RELSHP. SAEs in the cognitive domain (COGN) were mentioned by 32.4% of the sample. Table 3 further lists the subdomains of the five domains of behavior and functioning ordered by their frequency of being mentioned.

With regard to valences, SAEs were clearly distinguishable into positive experiences (21% of all idea units) and negative experiences (63%), whereas ambivalent or not

Table 4. Correlations Between Positive and Negative Subjective Aging Experiences (SAEs) Across Domains of Behavior and Functioning

Number of SAEs[a]	2	3	4	5	6	7	8	9	10
1. Health and physical functioning (−)	.10	**.32***	**.45***	**.64***	.09	.04	.20	.23	.14
2. Cognitive functioning (−)		-.02	.16	.08	.07	.01	-.04	.03	.11
3. Interpersonal relations (−)			**.53***	**.42***	.01	.11	**.24***	.16	.09
4. Social-cognitive and social-emotional functioning (−)				**.51***	.09	.03	**.38***	**.31***	.10
5. Lifestyle and engagement (−)					.19	.02	**.35***	**.31***	.22
6. Health and physical functioning (+)						.17	**.49***	**.70***	**.80***
7. Cognitive functioning (+)							.12	.20	.21
8. Interpersonal relations (+)								**.71***	**.59***
9. Social-cognitive and social-emotional functioning (+)									**.68***
10. Lifestyle and engagement (+)									

Notes. Correlations larger than .30 are printed in bold.

[a]Each particpant's number SAEs was corrected for number of valid diary days.

"−" = negative reports and "+" = positive reports.

p < .001.

assessable experiences were less frequent (5% and 11%, respectively). The majority of participants reported both positive and negative experiences (54%); 39% of the participants had only negative experiences. Four percent of all participants with SAEs had only positive SAEs. In the domains of PHYS, COGN, and ENGAGE, negative aging experiences were most frequent. Only the subdomain *knowledge* represented an exception. SAEs in the domain of RELSHP were balanced with regard to emotional valence. The domain of COGN-EMOT displayed the largest proportion of positive aging experiences, yet subdomains differed markedly in terms of emotional valence. Reports about self-esteem and emotional experiences (joy or sadness) were usually positive, whereas SAEs about sense of control or dependency and motivational drive were primarily negative.

Regarding reference points, SAEs were primarily derived from current behavior and functioning (77%). Comparisons with other people's functioning (4%) and past (18%) or future experience (1%) were fairly scarce.

Exploring interdependencies among subjective aging experiences.—For SAEs domains with positive content correlations ranged from *r* = 0.49 to 0.88 and from *r* = 0.32 to 0.64 for SAEs domains with negative content, except for SAEs about COGN (Table 4). Correlations between positive and negative aging experiences, however, were less consistent: Negative SAEs in the domains COGN-EMOT and ENGAGE correlated weakly with positive SAEs in the domains RELSHP and COGN-EMOT. Overall, this pattern of correlations suggests that individuals, who report more negative SAEs, do not necessarily report fewer positive SAEs.

Differences in Subjective Aging Experiences by Gender, Age Group, Socioeconomic Status, and Functional Status

Findings from chi-square tests examining group differences in SAE with regard to several key variables are presented in Table 5. These findings indicate that women were more likely than men to have positive aging experience in the domains RELSHP and COGN-EMOT, but more negative aging experiences in the domains PHYS and ENGAGE. With regard to age group, participants in the older age group (80–89 years old) reported both, more negative SAEs and more positive SAEs, compared with the younger age group. Group differences by socioeconomic status emerged only for participants with low levels of education, who had more negative aging experiences regarding physical appearance. Finally, participants with a low functional status reported more negative aging experiences across all five behavioral domains.

Associations of Subjective Aging Experiences and Well-Being Measures

Results from the regression of aggregated numbers of SAEs on positive and negative affect, life satisfaction, and VOL are presented in Table 6. Age, gender, education, income, and functional status were controlled in all analyses. SAEs were entered into the regression equation in blocks of positive, negative, and ambivalent experiences and tested for significant increase in model fit. We present only the findings for positive and negative SAEs because no significant results were found for ambivalent SAEs. Each well-being measure was regressed both on the five domain-specific measures of positive and negative SAEs and on the aggregated positive and negative SAEs across domains because we were interested in comparing the effect of domain-specific and cross-domain SAEs. Differences regarding predictive efficiency were tested for significance (Steiger, 1980).

Aggregated positive SAEs across domains were significantly associated with PA. Of the domain-specific aging experiences, positive experiences in the COGN-EMOT domain were the significant predictor of PA. However, prediction of PA from domain-specific SAEs was as good

Table 5. Significant Group Differences for the Occurrence of Subjective Aging Experiences (SAEs)

Domain of behavior and functioning	Gender[a] (women report more than men)	Age[a] (80 to 89 year olds report more than 70 to 79 year olds)	Education[b] (ind. with low education report more than ind. with high education)	Functional status[c] (low functional status ind. report more than high functional status ind.)
Health and physical functioning	Negative SAEs about PHYS ($\chi^2 = 13.87$, $p = .0002$, $SP = 0.96$) Negative physical sensations ($\chi^2 = 11.91$, $p = .0006$, $SP = 0.93$)	Positive physical sensations ($\chi^2 = 7.02$, $p = .008$, $SP = 0.32$) Mobility constraints ($\chi^2 = 9.33$, $p = .002$, $SP = 0.45$)	Negative physical appearance ($\chi^2 = 8.46$, $p = .004$, $SP = 0.83$)	Negative mobility ($\chi^2 = 10.51$, $p = .004$, $SP = .90$) Health constraints ($\chi^2 = 8.30$, $p = .004$, $SP = 0.82$)
Cognitive functioning	—	—	—	Knowledge constraints ($\chi^2 = 6.76$, $p = .009$, $SP = 0.74$)
Interpersonal relations	Positive SAEs about RELSHP ($\chi^2 = 8.76$, $p = .003$, $SP = 0.81$) Positive sense of belonging ($\chi^2 = 8.01$, $p = .005$, $SP = 0.81$)	Negative SAEs about RELSHP ($\chi^2 = 10.45$, $p = .001$, $SP = .48$) Negative social support ($\chi^2 = 13.96$, $p = .0002$, $SP = 0.50$) Negative accounts of number, frequency, and type of contact ($\chi^2 = 9.06$, $p = .003$, $SP = 0.40$) Positive expectations in social interactions ($\chi^2 = 7.48$, $p = .006$, $SP = 0.31$)	—	Lacking sense of belonging ($\chi^2 = 10.69$, $p = .001$, $SP = 0.90$) Negative accounts of number, frequency, and type of contact ($\chi^2 = 11.86$, $p = .0006$, $SP = 0.93$)
Social-cognitive and social-emotional functioning	Positive SAEs about COGN-EMOT ($\chi^2 = 11.11$, $p = .0009$, $SP = 0.92$) Self-composure ($\chi^2 = 11.81$, $p = .0006$, $SP = 0.93$) Joy ($\chi^2 = 11.06$, $p = .0009$, $SP = 0.91$)	Negative SAEs about COGN-EMOT ($\chi^2 = 13.42$, $p = .0002$, $SP = 0.60$) Positive experiences of time ($\chi^2 = 7.06$, $p = .008$, $SP = 0.31$)	—	Negative SAEs about COGN-EMOT ($\chi^2 = 6.97$, $p = .008$, $SP = 0.75$) Lacking personal control ($\chi^2 = 9.42$, $p = .002$, $SP = 0.87$)
Lifestyle and engagement	Negative SAEs about ENGAGE ($\chi^2 = 10.20$, $p = .001$, $SP = 0.89$)	Restricted action scope ($\chi^2 = 7.10$, $p = .008$, $SP = 0.34$)	—	Negative SAEs about interests ($\chi^2 = 6.70$, $p = .009$, $SP = 0.73$) Negative time-management ($\chi^2 = 7.31$, $p = .007$, $SP = 0.77$)

Notes. SP = statistical power; PHYS = health and physical functioning; RELSHP = international relationships; COGN-EMOT = social-cognitive and social-emotional functioning; ENGAGE = lifestyle and engagement.

[a] $\chi^2(df = 1, n = 222)$.

[b] $\chi^2(df = 1, n = 217)$.

[c] $\chi^2(df = 1, n = 218)$.

as prediction from aggregated positive experiences across domains ($z = 0.98$, $p = .16$).

Aggregated negative SAEs across domains were significantly associated with NA. Of the domain-specific aging experiences, negative experiences in the COGN-EMOT domain were associated with higher levels of NA and negative experiences in the RELSHP domain were associated with lower levels of NA. The prediction of NA from domain-specific SAEs was marginally better than prediction from aggregate measures of negative SAEs ($z = 1.61$, $p = .054$).

No significant effect of aggregated or domain-specific SAEs was found for life satisfaction. Finally, aggregated negative SAEs were associated with lower VOL and aggregated positive SAEs were (marginally) associated with higher VOL, whereas the overall model fit for domain-specific SAEs was not significant.

DISCUSSION

Using a daily diary approach, this study examined the occurrence and content of SAEs in the everyday lives of older adults. The results from this study provided empirical support for the validity of the five behavioral domains for measuring the construct AARC (Diehl & Wahl, 2010). As expected, most accounts of aging experiences were about the domain PHYS, but RELSHP, COGN-EMOT, and ENGAGE were also common domains in which SAEs occurred. SAEs in the COGN domain were reported by comparatively few participants. Given the high prevalence rates of subjective memory complaints reported in the cognitive aging literature (Jonker, Geerlings, & Schmand, 2000; Ponds, Commissaris, & Jolles, 1997), this was a somewhat surprising and unexpected finding. Subjective memory complaints might be shaped by factors other than objective cognitive functioning (Kliegel & Zimprich,

Table 6. Standardized Regression Weights From the Regression of Domain-Specific and Aggregated Subjective Aging Experiences (SAEs) on Well-Being Measures

Predictors[b]	PA[a]		NA[a]		LS[a]		VOL[a]	
	β Model 2	β Model 3	β Model 2	β Model 3	β Model 2	β Model 3	β Model 2	β Model 3
Domain-specific SAEs								
PHYS–	−0.13	−0.12	0.11	0.11	−0.17	−0.18	−0.22[†]	−0.23*
COGN–	0.02	0.04	−0.06	−0.05	0.02	0.03	−0.04	−0.03
RELSHP–	−0.17[†]	−0.16	−0.25*	−0.22*	−0.01	−0.01	−0.04	−0.02
COGN-EMOT–	0.05	−0.05	0.28**	0.24*	−0.09	−0.13	−0.12	−0.18
ENGAGE–	0.22[†]	0.15	0.08	0.04	0.16	0.14	0.19	0.17
PHYS+		−0.12		0.06		−0.16		−0.02
COGN+		−0.05		−0.03		0.02		0.05
RELSHP+		0.05		−0.08		−0.09		−0.07
COGN-EMOT+		0.33*		0.13		0.32*		0.27[†]
ENGAGE+		−0.01		−0.04		0.03		−0.08
R^2	0.08	0.14[†]	0.17***	0.18***	0.09	0.12	0.09	0.12
ΔR^2	0.03	0.06[†]	0.09**	0.01	0.02	0.03	0.05	0.03
SP	0.39	0.74	0.93	0.16	0.28	0.46	0.63	0.43
Aggregated SAEs across domains								
Negative SAEs	0.01	−0.05	0.22**	0.19*	−0.05	−0.09	−0.17*	−0.22**
Positive SAEs		0.20*		0.08		0.12		0.14[†]
R^2	0.05	0.09*	0.12**	0.13**	0.07	0.08	0.06[†]	0.08[†]
ΔR^2	0.00	0.04*	0.04**	0.01	0.00	0.01	0.03*	0.02[†]
SP	0.05	0.73	0.81	0.18	0.19	0.31	0.58	0.45

Notes. PHYS = health and physical functioning; COGN = cognitive functioning; RELSHP = interpersonal relationships; COGN-EMOT = social-cognitive and social-emotional functioning; ENGAGE = lifestyle and engagement; VOL = valuation of life; SP = statistical power.

"–" denotes negative reports and "+" denotes positive reports.

[a]All analyses were controlled for age, gender, education, income, and functional status in Model 1.

[b]Each particpant's number of SAEs was corrected for number of valid diary days.

[†]$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

2005). Thus, if memory complaints are noticed in everyday life, their diagnostic value for the sense of having grown older might either be downgraded or, alternatively, cognitive impairments might be repressed or overlooked because of their threat to the self-concept (Greve & Wentura, 2003) and other more tolerable age-related changes might attract older adults' attention instead.

SAEs about COGN were uncorrelated with other domains of age-related experiences at least in this group of cognitively unimpaired community-dwelling adults. In contrast, the domains PHYS, RELSHP, COGN-EMOT, and ENGAGE were closely linked for aging experiences of equal valence, whereas negative experiences were mostly uncorrelated with positive experiences. This latter finding suggests that the occurrence of negative SAEs does not necessarily imply that older adults have fewer (or more) positive SAEs but that negative and positive SAEs are statistically independent. Traditional subjective age measures fall short in capturing this multidirectionality of SAEs and, hence, new measurement methods, such as the daily diary approach, are called for. Furthermore, the open-ended format generated a diverse and rich set of experiences, which is necessary to inform the development of new, domain-specific and more standardized measurement approaches. Indeed, we currently develop a new multidimensional questionnaire that incorporates this article's findings.

Consistent with previous studies, negative SAEs were predominant particularly in the domains of PHYS, COGN, and ENGAGE, thus pointing to the expected developmental losses that adults consider normative for later life (Heckhausen et al., 1989). In the behavioral domains of RELSHP and COGN-EMOT, however, positive and negative SAEs were reported with equal frequency and for some subdomains positive perceptions were even more characteristic (i.e., sense of belonging, self-esteem, joy, or sadness). In addition, it is important to note that some positive SAEs were reported in domains where objective data suggest decline, such as physical appearance in the domain of PHYS. Here, participants usually reported that they realized that the common stereotype of deteriorating appearance did not apply to them. Drawing attention to positive contents of SAEs, as a means to counteract the effects of negative age stereotypes (Meisner, 2012), could provide important insights into how to preserve well-being into very old age.

Another aim of this study was to gain a better understanding of correlates of interindividual differences in SAEs. Except for an effect of education on negative SAEs about physical appearance, no group difference was found by socioeconomic status. Thus, similar to subjective age (Infurna, Gerstorf, Robertson, Berg, & Zarit, 2010; Rubin & Berntsen, 2006), SAEs may remain relatively unaffected by sociodemographic indicators. Interestingly, functional

status but not chronological age was consistently associated with more negative SAEs, which suggests that in this narrowly defined age group (i.e., old-old adults), the functional health of individuals affected their SAEs more than their age. In the subdomain of physical sensations, the older age group (i.e., 80–89 year olds) reported even more positive SAEs compared with the younger age group (i.e., 70–79 year olds). This difference may be due to a selection effect that results in overall more healthy survivors (i.e., survivor effect). Apparently, physically impaired older adults are at risk to have negative aging experiences beyond the domain of PHYS, especially in terms of losses in personal control, which corroborates the finding that limited physical functioning and low mastery beliefs are important predictors of "feeling old" in old age (Infurna et al., 2010).

Furthermore, gender had an effect on participants' SAEs. In particular, women were more likely than men to experience their aging as positive in the domains of RELSHP and COGN-EMOT. This finding might explain the tendency of women to report younger subjective ages, which has often been explained in terms of a greater necessity for women to protect their self against negative aging stereotypes (Pinquart & Sörensen, 2001). Whether this finding extends to women of younger age groups warrants further investigation.

Results of the regression analyses of aggregated SAEs on subjective well-being displayed a modest though very consistent pattern of negative experiences affecting negative affect and positive experiences influencing positive affect without any cross-over effects (e.g., negative experiences affecting positive affect). Of the domain-specific SAEs, aging experiences about COGN-EMOT were a reliable predictor of both PA and NA. One could argue that this association was due to an overlap between the two constructs. The two COGN-EMOT subdomains joy or sadness and self-composure or anxiety were indeed conceptually related to PA and NA. However, COGN-EMOT did comprise other subdomains that were not related to emotions, which were even more common. Thus, distinguishing domain-specific SAEs reveals that not so much perceived age-related change in the behavioral domains PHYS, COGN, RELSHP, and ENGAGE, but the perceived ability to deal with these changes (COGN-EMOT) relates to subjective well-being. Life satisfaction, on the other hand, remained mostly unaffected by SAEs. As expected, positive and negative affect, as state measures, were more closely linked to SAEs in daily life than cognitive components of well-being. SAEs might be accepted as a natural part of growing older and their importance for being satisfied with one's life as a whole might be downgraded. These findings corroborate previous studies: Loss-oriented SAEs were more strongly related to negative affect than gain-oriented SAEs and vice versa for positive affect, whereas the influence on life satisfaction was negligible (Steverink et al., 2001). With regard to VOL, both aggregated positive and negative experiences across domains displayed (marginally) significant associations.

Given the focus of VOL on extending health-based quality-of-life measures to incorporate positive emotion and resilience when faced with age-related losses (Lawton et al., 1999), it is not surprising to find associations with both positive and negative SAEs. Thus, beyond the effect of SAEs on affective well-being, positive SAEs might play an important role in preserving attachment and purpose in life in old age.

Limitations

Several limitations of this study need to be acknowledged. First, social or temporal comparisons as reference points for SAEs were rare. We assume that temporal change was implied in participant's diary entries and not further explicated, as they reported about their aging process. In order to study the role of reference points of SAEs in more detail, it would be necessary to instruct participants to specify the origin of the aging experience.

Second, although we believe that a general model, such as the AARC model (Diehl & Wahl, 2010), is promising to better understand naturally occurring awareness of aging events, there are also proposals in the literature to adopt a more situation-specific approach (Kornadt & Rothermund, 2011; Schindler, Staudinger, & Nesselroade, 2006). We believe that such alternative approaches are informative in their own right and compatible with the AARC approach because their prototypical situations can be mapped onto the five domains of the AARC model in a meaningful way. For example, situations such as financial strain or freedom to pursue new activities after entering retirement would in the AARC model be captured in the domain lifestyle and engagement. However, reports about retirement or relocation issues were not found in our data, suggesting that such events were not salient SAEs in the daily lives of our sample of old-old adults. As an alternative strategy, however, it would be interesting to apply other situation-oriented approaches to the assessment of naturally occurring age awareness experiences.

Third, it may be questionable that we provided our participants with AARC-related categories for their answers, as this could potentially have directed participants' attention toward noticing specific events. Leaving the format completely open and then delineating behavioral categories that entirely reflect the participants' perspective may be an alternative way to learn about SAEs. However, such an approach carries the risk of underreporting of SAEs and, thus, also has disadvantages. Moreover, in designing this study, we decided to use daily diaries instead of momentary reports to reduce the response burden for the study participants. Although differences between end-of-day and momentary reports have been found, we considered end-of-day assessments an adequate method for studying salient and relative discrete events such as SAEs (Stone & Shiffmann, 2002).

Furthermore, our data were constrained to the restricted age range of old-old adults and, therefore, may represent a

sample of SAEs that was skewed toward certain behavioral domains, such as PHYS. Different distributions of SAEs might be found in younger adults. Also, the cultural background of our sample of German-speaking adults living in the metropolitan area of Frankfurt restricts the generalizability of our findings. Previous studies indicated that SAEs are influenced by social and cultural factors (Westerhof, Whitbourne, & Freeman, 2012). Thus, different contents of SAEs might emerge when replicating this study in other countries.

Finally, we reported cross-sectional analyses based on aggregated measures of daily SAEs and its associations with recalled affect, which is only a limited indicator of momentary affect (Röcke, Hoppmann, & Klumb, 2011). Due to our cross-sectional research design, we cannot draw any conclusions about the dynamic, time-related interplay between different domains of SAEs or between SAEs and well-being related measures from this study. Investigating within-person fluctuations of SAEs over shorter and longer time periods, and their influence as a stressor on daily well-being, is an important next step in future research and can be addressed with this rich data set and with follow-up data.

In conclusion, this study is—to the best of our knowledge—the first to present a complex, facet-rich conception of SAEs in old age based on a mixed-methods approach. Using the daily diary method, we were able to capture aging experiences in a natural, ecologically valid way. Differential effects of domain-specific aging experiences on subjective well-being point at the pivotal role of social-emotional and social-cognitive aging experiences and highlight the importance of considering multidimensionality and multidirectionality in exploring the mechanisms by which perceptions of a person's own aging affect developmental outcomes.

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