Full-Length Research Report

Measuring Generativity in Older Adults

The Development of New Scales

Angela Schoklitsch and Urs Baumann

University of Salzburg, Austria

Abstract. Erikson already emphasized the importance of remaining generative in old age. Current instruments designed to measure generativity, however, were developed to be used with middle-aged adults. In a sample of older adults ($N = 195$), three newly developed instruments measuring different facets of generativity, each with several scales, were applied and tested with regard to methodological issues (internal structure, internal consistency of scales), bivariate associations with established instruments of generativity and social desirability, and age and gender differences. The study results confirmed that the theoretically assumed factor structure and characteristics of the scales support the assessment of generativity in a multidimensional way in older adults. Positive associations with the Loyola Generativity Scale (LGS) demonstrate a positive validation result.

Keywords: generativity, older adult, scale development

Introduction

It was in old age that he saw the fruits of able care, that of some few things well cared for and of a grand generativity in which adults show an active if detached concern for life itself, for grandchildren, and for the wider species (Hoare, 2002; p. 192).

Erikson (1950) introduced the concept of generativity more than 50 years ago and defined it as "the concern in establishing and guiding the next generation" (p. 267). He assumed a developmental model throughout life with eight stages and defined generativity as the seventh developmental task in midlife. Although, Erikson initially thought of generativity as a stage in midlife, he emphasized that older people should maintain a dignified generative function and proposed that grandparenthood offered individuals a second chance at generativity: "Old people can and need to maintain a *grand*-generative function" (Erikson & Erikson, 1997, p. 63).

The concept of generativity as an important element in human development, significantly impacting one's ability to age successfully, was discussed later by other authors as well. Fisher (1995) interviewed elderly employees and found that having a sense of purpose or generativity was central to their belief that they were aging successfully.

According to Kruse and Wahl (2010), older age offers the possibility to realize generativity based on acquired idealistic (i.e., experience, knowledge, and time) and material resources. They describe it as a facet that has yet to be acknowledged for its significant contributions to aging.

Instruments designed to measure generativity were developed for use with middle-aged adults. As the majority of these studies have not examined adults beyond their early 70s, little consideration has been given to whether these assessment methods are suitable or appropriate for older people. For example, the Loyola Generativity Scale (LGS; McAdams & St. Aubin, 1992), the most common instrument measuring generativity, consists of items that are problematic or unsuitable for older adults (e.g., regarding current concerns for having children). Furthermore, past experiences become more important for older people's sense of self-concept (e.g., Dittmann-Kohli, 1995). Existing scales, however, focus only on the present, the future, or the recent past, while the newly developed scales assess generative concerns from both a life review and a past perspective (parental generative concerns). The newly developed questionnaires and first empirical results based on a sample of older adults represent one way of acknowledging the impact of generativity on the aging process and, subsequently, its importance as a topic within the field of gerontology.

Erikson's Concept of Generativity and Subsequent Developments

Erikson (1950) introduced generativity (vs. stagnation) as the seventh developmental task in midlife following basic trust (vs. basic mistrust), autonomy (vs. shame), initiative (vs. guilt), industry (vs. inferiority), identity (vs. confusion), intimacy (vs. isolation) and preceding integrity (vs. despair). Accordingly, midlife adults have the responsibility to bear, nurture, and guide subsequent generations as well as to develop and maintain societal institutions and natural resources (Erikson, Erikson, & Kivnick, 1986). Children are important for generativity but "the mere fact of having or even wanting children" does not "achieve generativity" (Erikson, 1950, p. 267). On the other hand, it is possible to be generative without having children.

The first theorist to expand significantly upon Erikson's ideas about generativity was Kotre (1984). He proposed that four distinct forms of generativity exist: *biological, parental, technical,* and *cultural.* Biological generativity is about begetting, bearing, and nursing children. Parental generativity is expressed in feeding, clothing, sheltering, loving, and disciplining offspring (biological or not) and initiating them into the family's traditions. Technical generativity is accomplished by teachers, who pass on skills to those less advanced than themselves (e.g., how to read, how to program a computer, how to perform a healing ritual). When teachers move from teaching skills to passing on their meaning, they become culturally generative.

Erikson (1950) always thought of generativity as a midlife task. According to Kotre (1996), the schedule for the appearance is misleading as Erikson failed to differentiate between the various types of generativity and their relevance. For example, biological generativity – conceiving and bearing children – has a far earlier onset and conclusion, particularly in the case of women, than cultural generativity. Empirical support for this suggestion can be found in Snarey's (1993) longitudinal study, in which parental generativity precedes *societal* (i.e., technical and cultural) generativity. "Societal generativity principally involves caring for other younger adults: Serving as a mentor, providing leadership, and generally contributing to the strength and continuity of subsequent generations" (p. 22). This type of generativity usually begins around midlife and remains predominant until late adulthood. Similar, Manheimer (1995) proposed that cultural generativity may be linked to late life "when they have done their begetting, nurturing and passing on of skills" (p. 17).

Vaillant (2002) proposed that there are six adult life tasks: identity, intimacy, career consolidation, generativity, keeper of the meaning, and integrity. Keeper of the meaning implies the role of a wise judge; Erikson assigned parts of this task to both generativity and integrity. The focus is on the conservation and preservation of collective products, hence the culture and its institutions rather than the development of its children. Thus, as suggested by Vaillant,

a 70-year-old is usually better at being a keeper of the meaning than a 30-year-old.

The specifications of the concept of generativity are especially important when looking at generativity in older adults as they suggest that certain aspects become particularly important in older age (keeper of the meaning, societal generativity).

In the present study Kotre's (1984) four domains of generativity were complemented by the addition of social and ecological generativity. The domain of social generativity was added as it seemed to be an important aspect of generativity not yet explicitly discussed in the literature. Some of the items used were derived and modified from other questionnaires measuring generativity, e.g., "I enjoy guiding young people" (Ochse & Plug, 1986). Although, Erikson et al. (1986) cited the importance of the maintenance of natural resources to generativity in previous works, this principle has yet to receive adequate attention. Most of the items for ecological generativity were derived from the principle program of the Green Party in Austria (e.g., animal protection). This type of generativity, not included in previous scales, was added in order to acknowledge that the concept of passing the environment on to subsequent generations, is of similar importance to the future of humankind, as is, for example, values and experiences. Given the basic idea of generativity, we not only need technical and cultural but social skills (keyword: globalization) and an environment in which to live (keyword: global warming). In contrast to the other aspects, ecological generativity requires less contact with other people. In sum, from a theoretical perspective, no clear assumptions can be made with regards to the strength of associations between the different generative aspects.

The Importance of Generativity to Gerontological Research

According to Erikson and Erikson (1997), the discontinuity of family life contributes to the lack of that minimum level of vital involvement that is necessary for staying truly alive in old age. Erikson and Erikson proposed that "lack of vital involvement often seems to be the nostalgic theme hidden in the overt symptoms that bring old people to psychotherapy. Much of their despair is, in fact, a continuing sense of stagnation" (p. 63). This suggests that generativity is indeed an important factor in maintaining one's psychological health in old age.

P. Baltes and M. Baltes (1990) cite generativity and wisdom as examples for a normative definition of an ideal state in old age. Achieving generativity would then become evidence of a successful aging process. Lang and M. Baltes (1997) distinguished between three types of generativity in older age: (1) creating lasting values which includes finalizing decisions regarding certain life goals and social contacts, (2) "keepers of meaning" and thereby improving the connection between change and continuity, (3) self-decentness and

self-responsibility (e.g., being less demanding and thus relieving subsequent generations). Hagestad and Uhlenberg (2006) pointed out that age segregation impedes generativity, particularly the creation and maintenance of a generative society. Thus, even if older people want to express their concerns, it is not always possible to achieve generativity.

Today, in Western countries more people are staying active and healthy for longer than ever before, and the proportion of older people has increased dramatically over the last decades. "With more adults living into old age, there is heightened concern about making the later years of life quality ones – characterized by good health and positive well-being" (An & Cooney, 2006, p. 410). A number of studies investigating the relationship between generativity and well-being or life satisfaction consistently demonstrated a positive association (e.g., Ackerman, Zuroff, & Moscowitz, 2000; Keyes, & Ryff, 1998; Ochse & Plug, 1986). As correlations were especially strong when looking at generative concerns (e.g., McAdams, St. Aubin, & Logan, 1993; St. Aubin & McAdams, 1995), the newly developed instruments focus on this facet of generativity. Although there is no empirical evidence for older age groups, a similar association between generativity and positive health indicators can be assumed.

Objectives

The current study sought to specify and define the generative concerns of individuals in later life stages and obtain empirical evidence for the three newly developed scales based on Kotre's (1984) four age-specific subtypes. Various time perspectives (past, life review, present) were introduced, in light of the increasing levels of importance older adults assign to the past, in order to see if additional information could be derived. To validate the new scales, we employed the most common instrument – the LGS – used to measure generativity. Former research indicates that it is important to control for social desirability when investigating generativity (e.g., Ochse & Plug, 1986). Therefore, we included a scale controlling for this variable in this study. The influence of gender and age, variables which were often cited as relevant when investigating generativity (e.g., McAdams & St. Aubin, 1992; McAdams et al., 1993; McKeering & Pakenham, 2000), is also addressed in the research study.

Method

Participants

Participants were recruited through senior citizen community centers. Selection criteria were limited to those aged 60 or older with no cognitive impairment. A total of 195 older adults (110 women and 85 men) ranging in age from 60 to 94 ($M = 72.5$, $SD = 8.8$) participated in this study. Most of them were Austrian citizens (84.6%) living in private households (90.8%). The majority were married (55.4%). Most of them had their own children (85.6%) with an average of two. Furthermore, the majority of the participants had completed an apprenticeship (27.6%) or professional school (23.4%). For more details see Table 1.

Table 1. Sample characteristics ($N = 195$)

Variable				
Gender	n (%)	Female	110	(56.4)
		Male	85	(43.6)
Age	M		72.5	
	Mdn		71.4	
	SD		8.8	
	Range		60–94	
Nationality	n (%)	Austrian	165	(84.6)
		German	30	(15.4)
Place of residence	n (%)	Austria	161	(82.5)
		Germany	31	(15.9)
		Missing	3	(1.5)
Housing	n (%)	House	85	(43.6)
		Apartment	91	(46.7)
		Private room	1	(0.5)
		Senior citizens residence	18	(9.2)
Family status	n (%)	Single	10	(5.1)
		Relationship	12	(6.2)
		Married	108	(55.4)
		Separated	2	(1.0)
		Divorced	19	(9.7)
		Widowed	44	(22.6)
Children	n (%)	No children	28	(14.4)
	M		2.0	
	Mdn		1.9	
	SD		1.4	
	Range		0–8	
	% alive		95.2	
Adoptive or foster children	n (%)		9	(5.2)
Educational background	n (%)	Compulsory school	23	(12.0)
		Apprenticeship	53	(27.6)
		Professional school (without Matura)	45	(23.4)
		Secondary school (with Matura)	29	(15.1)
		College	8	(4.2)
		University	33	(17.2)

Procedure

The empirical examination of the three newly developed scales was part of a larger project, which also included questionnaires on mental and physical health as well. Due to issues associated with the older ages of the sample group (e.g., some of them were visually impaired), 18 participants (9.2%) answered the questions in the context of an interview (items were read to them out loud). In these cases the interview usually took place at the home of the participants. However, most of the subjects (90.8%), completed the questionnaires on their own.

After 1 month, part of the sample group ($n = 20$) that had given their agreement when first interviewed were sent the questionnaires on generativity again by mail to test the stability of the construct; 19 of them returned them back after, on average, 41.3 days ($SD = 8.1$, Min = 31/Max = 59 days). The selection criterion was that they were able to complete the questionnaires on their own.

Development of Three New Scales (Gen-Life, Gen-Current, and Gen-Parental)

The three new questionnaires are based on Kotre's (1984) four types of generativity (biological, parental, technical, and cultural) complemented by social and ecological generativity. They focus on generative concerns in the life review (Gen-life), current generative concerns (Gen-current) and past parental generative concerns (Gen-parental). Furthermore, these are self-assessment instruments in which answers are given on a 4-point Likert-scale (from 1 = *does not apply* to 4 = *applies*). Participants received the information that the questionnaires were on generativity and their own self-perception. After the scales had been pretested, only a few minor changes were made.

Generative Concerns in the Life Review

Gen-life consists of 29 items with four generativity domains: technical, cultural, social, and ecological. Individuals were to average their generative concerns over their whole adult life (beginning at the age of 20). An example was included in the introduction. Items always completed a sentence that began with, "It has been a concern for me . . ." (e.g., ". . . to pass on experiences to younger people."). Younger people were defined as subsequent generations (15–20 years younger).

Current Generative Concerns

Gen-current consists of the same 29 items as Gen-life, again with the four generativity domains: technical, cultural, social, and ecological. The only aspect of the instruc-

tions that differed from the previous questionnaire is that items were now to be rated as if they applied to the present moment.

Past Parental Generative Concerns

Gen-parental was created for individuals who were parents or who had been parents (in cases in which their child or children already died). The scale consists of two domains: biological and parental generativity in the narrower sense, with altogether 19 items. Individuals were to indicate several concerns they have had when their child/children grew up (i.e., from birth until the age of 20).

Loyola Generativity Scale (LGS)

Completing the LGS, adults rated how often 20 statements (e.g., "I try to pass along the knowledge I have gained through my experiences.") applied to them on a 4-point scale ranging from *never* to *very often/nearly always*. Cronbach's αs of .83 and .84, respectively, suggest a high internal consistency in two different samples (an adult sample ranging in age from 19 to 68 and a college sample). Test-retest reliability of the LGS over the 3-week period was .73, suggesting moderately high temporal stability (McAdams & St. Aubin, 1992). The LGS contains two items that are problematic for older adults, namely, "If I were unable to have children of my own, I would like to adopt children" and "I think I would like the work of a teacher." For this study the first item was deleted and the second one changed into "I think I liked or would have liked the work of a teacher." Thus, the final version of the LGS used in this study included 19 items.

Social Desirability

A total of 6 out of 17 items of the social desirability scale previously used by Ochse and Plug (1986) in a study with a self-reporting questionnaire of Erikson's first seven stages were included, e.g., "I am completely honest with everybody." As social desirability was mixed in with the LGS items, both scales had the same answering categories.

Results

Because preliminary investigations as well as more literature supporting the assumed factors would have been required to use confirmatory factor analyses, this study used exploratory factor analysis (principal component analysis). First, we used both oblique (oblimin) and orthogonal (varimax) factor analysis to examine the data. If both rotations lead to similar results, a very stable factor structure could

Table 2. Gen-Life: median, loadings, corrected item-total correlations, explained variance and internal consistencies (*n* = 165)

			Rotated factor analysis (Varimax)				
			Components				
Item		*Mdn*	1	2	3	4	r_{it}[a]
Social G.							
29	Take on responsibility	3.1	**.79**	.15	.18	.01	.73
8	Care for young people	3.2	**.74**	.14	−.01	−.07	.61
19	Help young people to develop	3.4	**.68**	.07	.35	.13	.64
10	Guide young people	2.8	**.67**	.13	.10	.14	.59
7	Assist young people	3.1	**.65**	.14	.33	.12	.62
12	Impart social values	3.4	.55	.42	.27	.21	
17	Pass on knowledge	3.3	.52	.24	.26	.25	
15	Be a role model	3.3	**.48**	.33	.03	.13	.44
6	Impart cultural values	3.1	.48	.18	.45	.05	
5	Teach how to play certain games	2.7	.46	−.08	−.08	.24	
25	Show how to handle money	3.3	.39	.36	−.12	.26	
1	Pass on experiences	3.4	.33	.24	.13	.25	
Ecological G.							
24	Be thrifty with energy	3.5	.00	**.81**	.08	.11	.64
18	Leave behind an intact environment	3.5	.19	**.79**	.15	.06	.68
14	Live ecology-minded	3.5	.17	**.78**	.14	.13	.68
3	Avoid garbage	3.5	.04	**.64**	−.08	.06	.49
26	Buy organic food	2.9	.15	**.50**	.19	−.07	.38
22	Protect animals	3.3	.18	**.49**	−.26	.34	.42
4	Support social institutions	3.1	.27	.45	.35	−.19	
Cultural G.							
20	Positive changes in society	2.7	.22	.21	**.73**	.23	.66
28	Pass on political values	2.6	.13	.12	**.73**	.16	.56
2	Get involved politically	2.0	−.15	−.01	**.71**	.00	.40
21	Support cultural facilities	2.4	.36	.02	**.51**	−.04	.43
9	Talk with young people about future of humankind	2.8	.35	.20	**.44**	.27	.45
16	Create enriching works	2.0	.34	−.13	**.43**	.26	.45
Technical G.							
13	Teach how to repair certain things	2.8	−.01	.21	.08	**.76**	.63
27	Teach how to deal with technical devices	2.3	.10	−.05	.18	**.75**	.57
11	How to work with certain materials	2.8	.20	.06	.16	**.73**	.65
23	Pass on skills	3.3	.49	.17	.01	**.63**	.53
Explained variance %			17.0	13.2	11.1	9.8	
(absolute)			33.3	25.9	21.7	19.2	
Cronbach's α			.83	.79	.75	.78	

Note. Response format: 1 = does not apply, 2 = rather does not apply, 3 = rather applies, 4 = applies. [a]$r_{it} \geq .20$, $p < .01$.

be assumed and an orthogonal factor solution recommended for ease of interpretation (e.g., Bühner, 2004). Advantages of an orthogonal rotation include lower intercorrelations between scales and greater independence of results from observed samples. As intercorrelations of scales were quite similar and relatively low in the current study for oblique and orthogonal rotation, we chose varimax rotation to maximize the independence of the scales for item analysis. It was not always possible to satisfy all the criteria, e.g., some items had higher loadings on other factors; yet some of these had to be kept in the scale as a minimum number of items were needed in order to satisfy internal consistencies as close as possible to the criteria Cronbach's $\alpha \geq .80$ (Bühner, 2004). Scale scores were built upon added raw scores.

Generative Concerns in the Life Review (Gen-Life)

For Gen-life, four factors were predicted: technical and cultural generativity based on Kotre (1984) and Snarey (1993) complemented by social and ecological generativity. Factor analysis yielded seven factors with initial eigenvalues over 1. Based on the scree plot showing a decline after the fourth factor, and in accordance with theoretical assumptions (see above), the four-factor solution was reported as follows: The eigenvalue of the first factor was 8.4 (28.8% explained variance), the second factor 2.5 (8.8% explained variance), the third factor 2.0 (7.0% explained variance), and the fourth factor 1.8 (6.4% explained variance). Thus, explanation of variance for the four factors is 51.0%.

For details concerning explained variance after rotation see Table 2. Of the 12 items with the highest loadings on factor 1 eight were created for social, two for cultural (6, 17), and two for technical (5, 25) generativity. The four items not created for this scale will not be considered in further analysis, nor will the two items (1, 12) created for social generativity that display similarly high loadings on other factors. Of the seven items with the highest loadings on factor 2, six were developed for ecological generativity. Item four was created for social generativity and will not be considered in further discussions of this scale. All six items with the highest loadings on factor 3 were created for cultural generativity and will be used for that scale. The four items with the highest loadings on factor 4 were developed for technical generativity. Item 23 is problematic because of a high loading on factor 1 but was kept in the scale, as it only consists of four items.

Corrected item-total correlations of the four scales were all highly significant ($r_{it} \geq .38$, $p < .01$) and the internal consistency was satisfying (Cronbach's $\alpha \geq .75$). For more details see Table 2. In sum, of the 29 Gen-life items, 22 can be assigned to the presumed scales.

Current Generative Concerns (Gen-Current)

As for the scale on generativity in the life review, a four-factor solution was predicted for current generativity. Factor analysis yielded five factors with initial eigenvalues over one. According to the scree plot and theoretical assumptions, the four-factor solution was reported in the following manner: The eigenvalue of the first factor was 8.9 (30.6% explained variance), the second factor 3.0 (10.3% explained variance), the third factor 2.0 (7.0% explained variance), and the fourth factor 1.6 (5.3% explained variance). Altogether, explanation of variance for the four factors is 53.2%.

For details concerning explained variance after rotation see Table 3. Five of the six items with the highest loadings on factor 1 were developed for technical generativity. Item 25 was developed for social generativity and will not be considered in further analyses. Item 20 has a high loading on factor 3 as well but will be included in the scale as the distance between loadings is large enough. Seven of the 10 items with the highest loadings on factor 2 were created for cultural generativity. Item 27 will not be included in further discussions because of its high loading on factor 3. The remaining three items (12, 14, 11) were developed for social generativity and will not be considered in further analyses. Of the seven items with the highest loadings on factor 3, five were developed for social generativity; one was created for cultural (18) and one for technical (8) generativity. All items developed for social generativity will be considered in further analyses. Unfortunately, most of these have high loadings on other factors as well (items 3, 6, 17, and 19). All six items with the highest loadings on factor 4 were created for the ecological generativity scale. Although, item 10 also has a high loading on factor 2, the distance between the loadings is large enough thus it will be considered in further analyses.

Corrected item-total correlations of the four scales were all highly significant ($r_{it} \geq .36$, $p < .01$) and internal consistency was satisfying (Cronbach's $\alpha \geq .74$). For more details see Table 3. Altogether, of the 29 items of the Gen-current, again 22 were allocated to the presumed scales.

Past Parental Generative Concerns (Gen-parental)

Based on Kotre's theory (1984) a two-factor solution was predicted for parental generativity (biological and parental). The scree plot supports a two- and three-factor solution. Based on theoretical assumptions, the two-factor solution was reported in the following manner: The eigenvalue of the first factor was 5.8 (30.6% explained variance) and the second factor 1.9 (9.8% explained variance). Hence, explanation of variance for both factors together is 40.4%. For details concerning explained variance after rotation see Table 4.

Table 3. Gen-current: median, loadings, corrected item-total correlations, explained variance, and internal consistencies ($n = 157$)

| | | | Rotated factor analysis (Varimax) | | | | |
| | | | Components | | | | |
Item		Mdn	1	2	3	4	r_{it}[a]
Technical G.							
13	Teach how to repair certain things	2.6	**.82**	.07	.05	.13	.74
9	How to work with certain materials	2.6	**.74**	.12	.12	.13	.68
15	Teach how to deal with technical devices	2.2	**.73**	.03	.18	−.04	.67
20	Pass on skills	3.0	**.65**	.12	.49	.03	.64
25	Care for young people	3.1	.60	.27	.24	.10	
23	Teach how to play certain games	2.5	**.53**	.22	−.03	.14	.36
Cultural G.							
22	Pass on political values	2.7	.18	**.69**	.10	.08	.55
26	Get involved politically	1.9	.08	**.64**	−.06	−.10	.50
7	Support cultural facilities	2.5	.02	**.59**	.17	.01	.43
12	Take on responsibility	2.9	.49	.58	.21	.00	
4	Positive changes in society	2.9	.05	**.54**	.28	.24	.47
14	Support social institutions	3.0	.05	.53	.16	.13	
2	Create enriching works	1.8	.19	**.53**	.11	−.06	.44
27	Impart cultural values	3.0	.14	.52	.49	.09	
29	Talk with young people about future of humankind	3.0	.25	**.52**	.25	.12	.45
11	Assist young people	3.2	.44	.48	.22	.07	
Social G.							
1	Pass on experiences	3.1	.10	.13	**.75**	.06	.55
3	Impart social values	3.3	.04	.39	**.65**	.23	.59
18	Pass on knowledge	3.3	.39	.27	.65	.13	
6	Be a role model	3.5	.04	.06	**.61**	.34	.46
17	Help young people to develop	3.2	.47	.33	**.58**	.02	.68
19	Guide young people	2.7	.44	.35	**.56**	−.07	.62
8	Show how to handle money	3.1	.29	.07	.48	.27	
Ecological G.							
16	Live ecology-minded	3.6	.00	.09	.19	**.86**	.73
28	Avoid garbage	3.7	.08	−.02	.05	**.83**	.67
21	Be thrifty with energy	3.6	.13	.03	.03	**.81**	.60
5	Leave behind an intact environment	3.6	−.05	.22	.27	**.67**	.57
24	Protect animals	3.4	.18	−.09	.28	**.56**	.49
10	Buy organic food	2.9	.15	.35	−.07	**.50**	.36
Explained variance %			14.3	13.8	13.0	12.1	
(absolute)			26.9	26.0	24.4	22.7	
Cronbach's α			.82	.74	.80	.78	

Note. Response format: 1 = does not apply, 2 = rather does not apply, 3 = rather applies, 4 = applies. [a]$r_{it} \geq .20$, $p < .01$.

Table 4. Gen-parental: median, loadings, corrected item-total correlations, explained variance, and internal consistencies ($n = 156$)

| | | | Rotated factor analysis (Varimax) | | |
| | | | Components | | |
Item		*Mdn*	1	2	r_{it}[a]
Parental G.					
12	Support friendships	3.2	**.74**	.05	.64
15	Deal with achievement	3.5	**.70**	.12	.60
13	Pass on values	3.7	**.67**	.25	.60
14	Encourage partnerships	3.3	**.67**	.21	.58
9	Support leisure activities	3.6	**.63**	.02	.50
19	Be a role model to deal with work	3.7	**.62**	.19	.53
3	Read or tell stories	3.5	**.61**	.04	.44
7	Support career decision	3.6	**.49**	.16	.42
17	Mind to whom friendships	3.3	**.46**	.30	.42
10	Pass on experiences	3.6	.45	.41	
Biological G.					
8	Continuity of family through offsprings	3.3	.18	**.77**	.62
2	Similar character of child/children	3.0	.13	**.76**	.55
16	Similar profession	1.4	.02	.59	
11	Look similar	1.8	.03	**.59**	.42
1	Be a role model concerning marriage	3.7	.17	.53	
18	Procure family identity	3.5	.45	.46	
4	Prepare for own family life	3.3	.41	.45	
5	Have own biological child/children	3.8	.13	**.45**	.28
6	Care for relationships to relatives	3.4	.35	.40	
Explained variance %			22.7	17.7	
(absolute)			(56.3)	(43.8)	
Cronbach's α			.82	.68	

Note. Response format: 1 = does not apply, 2 = rather does not apply, 3 = rather applies, 4 = applies. [a]$r_{it} \geq .21$, $p < .01$.

All 10 items loading highest on factor 1 were developed for the parental generativity scale. Item 10 will not be included in the final version of the scale as it shows high loadings on both factors. All four items created for the biological generativity scale have the highest loadings on factor 2 and will be considered in further analyses.

Corrected item-total correlations of the items included were highly significant ($r_{it} \geq .28$, $p < .01$). Cronbach's α of .68 for biological generativity was still acceptable taking into account the fact that the scale consisted of only four items. Internal consistency of α = .82 for parental generativity was satisfying.

Altogether, of the 19 items of the Gen-parental, 13 could be assigned to the presumed scales.

Intercorrelations

Intercorrelations of Scales

Scales Within Scales

– *Gen-life:* As can be seen in Table 5, all correlations between the scales of the four-factor solution are significant (range: $.24 \leq r \leq .49$, all $p < .01$), suggesting low to moderate degrees of association. The highest correlation was found between social and cultural generativity ($r = .49$, $p < .01$); this correlation of middle height demonstrates that the two domains are still relatively independent from each other.

– *Gen-current:* As with the Gen-life questionnaire, all cor-

Table 5. Intercorrelations of scales of the three new scales, the LGS, and social desirability (N = 195)

(Sub)scales	Gen-life Techn.	Cult.	Social	Ecolog.	Gen-current Techn.	Cult.	Social	Ecolog.	Gen-parental Parent.	Biolog.	LGS	Soc. des.
Gen-life												
Techn.	1											
Cult.	.35**	1										
Social	.38**	.49**	1									
Ecolog.	.25**	.24**	.40**	1								
Gen-current												
Techn.	.71**	.27**	.24**	.25**	1							
Cult.	.21**	.80**	.33**	.18*	.37**	1						
Social	.40**	.43**	.53**	.25**	.52**	.52**	1					
Ecolog.	.27**	.20**	. 23**	.77**	.26**	.25**	.34**	1				
Gen-parental												
Parent.	.25**	.32**	.39**	.33**	.25**	.31**	.39**	.38**	1			
Biolog.	.12	.04	.22**	.09	.16	–.02	.26**	.12	.39**	1		
LGS	.32**	.47**	.44**	.24**	.42**	.52**	.55**	.26**	.34**	.20*	1	
Soc. Desirability	.09	.04	.16*	.18*	.14	.12	.21**	.23**	.29**	.33**	.39**	1

Note. *p < .05, **p < .01.

relations between the scales of the four-factor solution are significant (range: .25 ≤ r ≤ .52, all p < .01). These correlations again suggest only low to middle levels of association between the scales. The highest correlations could be found between social and technical (r = .52, p < .01), and between social and cultural (r = .52, p < .01) generativity. Much like the Gen-life results, these correlations of middle height suggest that the different domains are relatively independent from each other.

– *Gen-parental:* The correlation between parental and biological generativity of r = .39 (p < .01) suggests that the two scales are associated with each other, but only moderately.

Scales Between Scales

– *Gen-life and Gen-current:* For the four-factor solution, as expected, the highest correlations (range: .53 ≤ r ≤ .80, all p < .01) were found between the same scales of the two different questionnaires (e.g., technical scale Gen-life and Gen-current). In particular, the associations between the cultural (r = .80, p < .01) and ecological (r = .77, p < .01) scales are high enough to question whether or not substantial additional information is provided by the two time perspectives measured (for details see Table 5).

– *Gen-life and Gen-parental:* Between the four scales of the Gen-life and the two scales of the Gen-parental, correlations are consistently stronger with parental (range: .25 ≤ r ≤ .39, all p < .01) versus biological generativity (only the correlation between biological and social generativity is significant with r = .22, p < .01) as can be seen in Table 5.

– *Gen-current and Gen-parental:* A correlation pattern, similar to the scales of the Gen-life and Gen-parental, appears between the scales of the Gen-current and Gen-parental (see Table 5).

In sum, parental generativity seems to be more closely associated with other aspects of generativity than biological generativity.

Correlations of Scales with the Loyola Generativity Scale (LGS) and Social Desirability

LGS and New Scales

Correlations of low to middle height between the scales of the three new questionnaires and the LGS (range: .20, p < .05 ≤ r ≤ .55, p < .01) indicate a positive convergent validity result (see Table 5). The scales are associated with each other but not at such a high level as to suggest that they are measuring the same aspects of generativity.

Social Desirability and New Scales

Findings indicate that parental and biological generativity are possibly more strongly influenced by social desirability (r = .29 and .33, both p < .01) than the other domains of generativity (range: .04, p > .05 ≤ r ≤ .23, p < .01). However, the LGS was the scale most strongly associated with social desirability in the current study (r = .39, p < .01), maybe because social desirability was mixed with the LGS items. For more details see Table 5.

Table 6. Test ($N = 195$)-retest ($N = 19$)-correlations of the scales, the LGS, and social desirability

	Gen-life	Gen-current		Gen-parental	LGS
Techn.	.54*[a] (.85[b])	.72** (.91)	Parent.	.62* (.77)	.81**
Cult.	.35 (.63)	.73** (.90)	Biolog.	.60* (.88)	
Social	.28 (.55)	.82** (.95)			
Ecolog.	.04 (.12)	.52* (.77)			

Notes. *$p < .05$, **$p < .01$. [a]Spearman-correlations, [b]Spearman-Brown prophecy (19 items).

Influence of Gender and Age (Two-Factor ANOVA)

Gen-Life

The ANOVA yielded significant main effects for gender concerning cultural generativity ($F(1, 182) = 11.42$, $p < .00$; $\eta^2 = .06$), and technical generativity ($F(1, 183) = 18.90$, $p < .00$; $\eta^2 = .10$) in the life review, with men scoring higher than women in all cases. No main effect for age could be found. Furthermore, the ANOVA yielded one significant interaction effect for cultural concerns in the life review ($F(1, 182) = 5.87$, $p = .02$; $\eta^2 = .03$), with younger men and women (60–74 years) having similar concerns which diverged as they got older (older men having higher, and older women lower scores, compared with the younger age group).

Gen-Current

The ANOVA yielded significant main effects for gender concerning current cultural generativity ($F(1, 168) = 5.08$, $p = .03$; $\eta^2 = .03$), technical generativity ($F(1, 177) = 18.17$, $p < .00$; $\eta^2 = .10$), and social generativity ($F(1, 175) = 5.14$, $p = .03$; $\eta^2 = .03$) with men scoring higher than women in all cases. No main effect for age and no interaction effect could be found.

Gen-Parental

The ANOVA yielded no significant main effect concerning gender. For age (age groups: 60–74 years and 75–94 years) one significant main effect could be found concerning biological generativity ($F(1, 163) = 8.45$, $p < .00$; $\eta^2 = .05$), with the older age group scoring higher. No interaction effect could be found for this scale concerning age and gender.

LGS

In terms of a control analysis, a significant main effect concerning gender could be found ($F(1, 169) = 9.41$, $p < .00$; $\eta^2 = .05$) for the LGS, again with men scoring higher than women. However, the ANOVA yielded no age or interaction effect.

In sum, gender had a much stronger influence on generativity than age and only one interaction effect could be found for these two variables.

Bivariate Correlations Between Age and Generativity

Most correlations (Spearman) between scales on generativity and age were not significant (range: $.01 \le r \le -.15$). Only biological generativity was positively associated with age, $r = .33$ ($p < .01$).

Difference Between Parents and Childless Older Adults

The Mann-Whitney Test yielded only one significant difference concerning parenthood and generativity, with parents (n_1, $M = 19.25$, $SD = 3.65$) scoring higher than childless older adults (n_2, $M = 17.27$, $SD = 3.96$) on social generativity (life review), $U(n_1 = 153, n_2 = 26) = 1397.5$, $p < .05$.

Retest New Scales and LGS

Gen-Life

Even when taking into account the Spearman-Brown prophecy (19 items as the LGS), only technical generativity ($r = .85$, $p < .01$) showed very satisfying retest stability (see Table 6). Ecological generativity practically showed no stability ($r = .12$, $p > .05$) between the two time points. In sum, these results seem unconvincing with regards to the stability of life review generativity.

Gen-Current

Spearman-Brown corrected test-retest correlations for current generative concerns suggest a satisfying to very satisfying stability (range: $.77 \le r \le .95$, all $p < .01$).

Gen-Parental

For biological ($r = .77$, $p < .01$) and parental ($r = .88$, $p < .01$) generativity, Spearman-Brown corrected correlations between the first and second assessment were significant, suggesting satisfying to very satisfying stability for these scales.

LGS

For the LGS, a satisfying stability was found ($r = .81$, $p < .01$).

Thus, except for some scales on generativity in the life review (especially ecological generativity), all correlations of the scales between the two measurement points show satisfying to very satisfying stability.

Discussion

Although already identified as a topic associated with successful aging (e.g., Erikson & Erikson, 1997; Fisher, 1995), generativity has not received much attention. Most studies have not involved adults beyond their early 70s, and there is a lack of adequate instruments able to capture the unique features associated with generativity in older age. Therefore, new scales based on Kotre's (1984) four age-specific types of generativity were developed and empirically tested with a sample of older adults.

Results give empirical evidence for technical, cultural, social, and ecological generativity for the scales addressing current generativity and generativity in the life review. In regards to parental generativity, empirical support was found for the two scales addressing biological and parental generativity. Cronbach's α as a criterion of internal consistency are satisfying. Intercorrelations demonstrated low to middle degrees of correlation for the scales within the three newly developed questionnaires and support the assessment of generativity in a multidimensional way. Despite the small sample size of the second measuring point, all of the scales – except for generativity in the life review – showed strong stability over an average of 41.3 days. One explanation could be that life review is not a stable construct and more subject to influence (e.g., by current mood). As results for parental generativity (concerning the past) were higher, another reason could be that the instructions given for the life review scale were ambiguous and caused instability, as subjects were asked to average their concerns over the whole adult life span. Future research should therefore focus on exploring in greater detail how generativity in the life review could be assessed more reliably.

Given that the correlations between the same scales of generativity in the life review and current generativity were high enough to question whether or not the introduction of both scales provides additional information, and the life review scale showed a relatively weak stability, one conclusion of this study would be to use Gen-current rather than Gen-life in future studies.

In direct contrast to the literature (e.g., McAdams & St. Aubin, 1992; Peterson, Smirles, & Wentworth, 1997), men consistently reported higher generativity scores in the current study. One possible explanation for this is that predominantly midlife adults were included in previous research. Similar, Lugmayr (2010) found that grandchildren rated their grandfathers as being more generative than their grandmothers concerning parental, social, cultural, and technical generativity (measured with an adapted version of the scales used in the current study). According to the convergence hypothesis (Carmel & Bernstein, 2003), gender differences should decline during aging because social roles between the two genders become more similar and parenthood and occupation lose their importance. It is possible that men are becoming more aware of their generative concerns as they age, while women, on the other hand, may focus on the implicitness of social concerns over the entire lifespan. Support for this suggestion comes from Höpflinger, Hummel, and Hugentobler (2006), who found that child care assistance is regarded to be more of a matter of course in grandmothers than in grandfathers. Consequently, perception is stronger when grandfathers are involved with their grandchildren. Another explanation for the fact that men scored higher than women could be that some aspects are potentially more stereotypically male (especially technical and cultural generativity). However, gender differences were found for social generativity as well. Thus, the role that gender plays in the aging process needs to be further investigated, perhaps by investigating various age groups and the link between changing gender roles respectively gender role flexibility and their relationship to generativity.

Older subjects in the sample (75 years and older) reported having had more biological concerns. One explanation for this could be the fact that these individuals were young adults after WWII, a period that certainly involved some childbearing pressure.

Associations between the three newly developed scales and the LGS, the most common instrument measuring generativity demonstrate a positive validation result. However, the scales are not correlated with the LGS at a high enough level to suggest that they are measuring the same aspects of generativity. These results support the value of introducing these new scales in order to complement the most frequently used instrument to measure generativity.

Social desirability had particularly strong associations with social, ecological, parental, biological generativity, and the LGS. Findings of the current study clearly suggest that social desirability must be controlled for when investigating generativity.

Because the results are, in general, based on self-reporting, it is not possible to estimate to what extent participants really are currently generative, nor the extent to which they

have been in the past. Making use of other-rating systems (e.g., by asking the subject's children) might be one way in which self-reporting data could be regarded as more valid. However, it seems crucial to consider and incorporate the self-concept of older adults when looking at aspects associated with successful aging, particularly given the fact that previous studies consistently found the strongest associations between generative concerns (and not e.g., actions) and well-being (e.g., McAdams et al., 1993).

It can be concluded that these three new scales, which were developed and empirically tested in order to assess generativity among older adults, are important resources. As hypothesized, age-specific scales (Kotre, 1984) and their association with the most common instrument used to measure generativity (LGS) was confirmed. Thus, these new scales provide researchers with the unique opportunity to measure generativity in older adults in a multidimensional way.

Acknowledgments

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Mag. Angela Schoklitsch

Department of Psychology
University of Salzburg
Hellbrunnerstraße 34
AT-5020 Salzburg
Austria
E-mail: angela.schoklitsch@stud.sbg.ac.at