Research Article

Development of Generative Concern Across Mid- to Later Life

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Abstract

Background and Objectives: The development of *generativity*, or investment in the next generation, has been theorized about for decades. Extant empirical findings regarding generativity's trajectory, however, are mixed. Thus, the current study modeled the development of *generative concern*, or the extent to which individuals care for the next generation, across adulthood.

Research Design and Methods: The current study followed an accelerated longitudinal design, modeling generative concern's trajectory across the overlapping ages of 861 age-heterogeneous participants from the 10-year Notre Dame Study of Health & Well-being. Three models were fit to examine whether generative concern followed a linear, quadratic, or cubic trajectory across ages 40–84. The Final Model was tested for birth cohort effects to support the interpretation of developmental change.

Results: Generative concern followed an age-graded cubic trend across ages 40–84, and no birth cohort effects were apparent in this trajectory. Generative concern was highest at age 40. Although generative concern declined thereafter, it remained relatively stable across ages 50–70. Finally, generative concern declined after age 70.

Discussion and Implications: Generative concern, indeed, develops over time. The step-like declines across ages 40–84 are informative for both basic and applied researchers in that knowledge of this developmental trend bolsters decade-old theory and informs the optimal timing for intervention work.

Keywords: Analysis—hierarchical linear modeling, Life course/life span, Longitudinal Study, Psychosocial, Successful aging

Generativity, or investment in the next generation (Erikson, 1963; McAdams & de St. Aubin, 1992), permeates human flourishing. Indeed, generative individuals experience heightened psychological and social well-being (Keyes & Ryff, 1998), life satisfaction (McAdams et al., 1993), and societal engagement (Jones & McAdams, 2013); they are even less likely to die or develop functional disabilities (Gruenewald et al., 2012). Given generativity's clear linkages to well-being, theorists have long considered its developmental trajectory. Although scholars often emphasize generativity's midlife prominence (Erikson, 1963;

McAdams & de St. Aubin, 1992; Stewart & Vandewater, 1998), empirical inquiries into its trajectory have derived mixed results (Einolf, 2014; Keyes & Ryff, 1998; McAdams et al., 1993; Newton et al., 2019; Stewart & Vandewater, 1998). The current study's aim, therefore, was to model generativity's trajectory across ages 40–84.

Scholars have theorized about generativity's trajectory for decades. Erikson (1963) introduced the concept of generativity within his seventh life-span stage, *Generativity versus Stagnation*, during which mid-life adults would either come to promote successive

generations or fall into unproductive, self-indulgent states. Although Erikson's (1963) original conceptualization remains influential, contemporary theorists reject the notion of a generativity stage, instead emphasizing the presence of several facets across adulthood (McAdams & de St. Aubin, 1992; Stewart & Vandewater, 1998). Indeed, individuals may *desire* to be generative in early adulthood, although typically do not have the opportunities and resources, and thus, *capacity*, to act on such desires (Stewart & Vandewater, 1998). Once such capacity develops, which typically occurs in midlife, *cultural demand*, or societal norms for generativity, paired with an *inner desire* to be generative, drive *concern* for the next generation (McAdams & de St. Aubin, 1992). Such *concern*, bolstered by *belief* in the worthiness of future generations, leads to *commitments*, or plans for generativity that reach fruition through generative *actions*. Leading a generative life promotes individuals' *generative narration* or evaluation of the degree to which they have supported the next generation. This narration continually reshapes inner desire, cultural demand, concern, belief, commitment, and action, leading to a later-life sense of *generative accomplishment* (Stewart & Vandewater, 1998).

Although generativity is multifaceted, generative concern is considered the "most global feature" of generativity enactment (McAdams et al., 1998, p. 20). Describing the extent to which individuals care for the next generation or society at large, *generative concern* embodies what Erikson (1963) believed to stem from successful resolution of *Generativity versus Stagnation*, specifically *care* that extends beyond the self. Beyond its longstanding theoretical importance to successful aging (Erikson, 1963; McAdams & de St. Aubin, 1992), however, scores of extant studies have linked generative concern to well-being (Gruenewald et al., 2012; Keyes & Ryff, 1998; McAdams et al., 1993). First, in two cross-sectional studies including younger, midlife, and older adults, generative concern was linked to higher psychological and social well-being (Keyes & Ryff, 1998), as well as life satisfaction and happiness (McAdams et al., 1993). Next, Ackerman et al. (2000) found that midlife and younger adults experienced heightened positive affectivity with generative concern, but only midlife adults experienced higher life and work satisfaction. Finally, Gruenewald et al. (2012) found that older adults (i.e., aged 60–75) with higher levels of generative concern were less likely to have died or developed functional disabilities 10 years later. Thus, generative concern is an important generativity facet that confers benefits to individuals across adulthood.

Generative concern's well-documented link to well-being (Gruenewald et al., 2012; Keyes & Ryff, 1998), paired with its oft-theorized midlife peak (McAdams et al., 1998), has driven empirical inquiry into its developmental trajectory. First, in cross-section, Keyes and Ryff (1998) found that midlife adults (i.e., aged 40–59) reported higher levels of

generative qualities than both younger (i.e., aged 25–39) and older adults (i.e., aged 60–74); notably, generative qualities were operationalized as six items from McAdams and de St. Aubin's (1992) measure of generative concern, the Loyola Generativity Scale (LGS). Relatedly, McAdams et al. (1993) found a cross-sectional, quadratic, age-related difference in multivariate generativity, including generative concern, commitment, behavior, and narration. Specifically, midlife individuals (i.e., aged 37–42) reported higher generativity than younger (i.e., aged 22–27) and older individuals (i.e., aged 67–72). Although generative concern, specifically, did not display this quadratic age-related difference, midlife adults reported higher levels of generative concern than older adults. Notably, given that McAdams et al. (1993) did not find a midlife peak in generative concern with their early-midlife cohort, whereas Keyes and Ryff (1998) found a midlife peak with their broader midlife cohort, later-midlife individuals, specifically, may drive the midlife peak in generative concern. Taken together, however, cross-sectional results indicate that midlife adults consistently report higher generative concern than later-life adults (Keyes & Ryff, 1998; McAdams et al., 1993), but not necessarily younger adults (McAdams et al., 1993).

Unlike extant cross-sectional studies, which describe age-related *differences* in generativity, longitudinal studies elucidate age-related *change* in generativity. First, Einolf (2014) found that although generative concern had high rank-order stability ($r = 0.607$), men aged 24–29 reported more concern by 34–39, whereas individuals aged 60–69 reported less concern by 70–79. Individuals in other birth cohorts, however, did not experience such changes. Notably, this study was limited to two measurement occasions across a 10-year interval, which only enabled the interpretation of mean-level change in generative concern within birth cohorts as opposed to its developmental trajectory. Next, Newton et al. (2019) followed a sample of female college graduates across ages 43–72 to examine generativity's trajectory. Instead of self-reported generative concern; however, Newton et al. (2019) measured participants' generativity by rating them on several personality characteristics (e.g., whether the participant is generous) based on written essay responses. Multilevel models revealed that generativity linearly increased with age. In addition to analytical differences, measurement and sampling inconsistencies may explain these disparate findings. First, behavioral ratings of generativity may differ from self-reported generative concern. Indeed, behaviorally rated generative personality characteristics may reflect a different facet of generativity, accomplishment, which theoretically peaks in later life (Stewart & Vandewater, 1998). Finally, Newton's (2019) use of a highly educated birth cohort may limit the generalizability of their results, especially considering that higher education may promote opportunities, and thus, capacity, for generativity (Keyes & Ryff, 1998; Stewart & Vandewater, 1998). Taken together, however, generative concern's trajectory remains unclear.

The Current Study

Therefore, generative concern's developmental trajectory is not well established. Although midlife individuals tend to report higher generative concern than both younger (Keyes & Ryff, 1998) and older individuals (Keyes & Ryff, 1998; McAdams et al., 1993), this may be due to birth cohort differences and is not necessarily reflective of developmental change. Developmental change can only be investigated with longitudinal studies, and extant longitudinal work has been limited in important ways. First, Einolf (2014) was restricted to examining the mean-level change in generative concern across two measurement occasions within several birth cohorts and found that generative concern increased in men aged 24–29 by age 34–39 and decreased in individuals aged 60–69 by age 70–79. Next, Newton et al. (2019) measured behaviorally rated, generative personality traits in a highly educated female birth cohort across ages 43–72 and found that such personality traits increased with age. This behavioral measure may reflect a different generativity facet than generative concern, however, and their highly educated female birth cohort limits the generalizability of their results. Therefore, extant findings on generative concern's trajectory are mixed.

Addressing these limitations, we sought to determine *whether* and *how* generative concern changes across adulthood. Specifically, we estimated generative concern's developmental trajectory across ages 40–84 within an accelerated longitudinal design. *Accelerated longitudinal designs* capitalize on overlapping trajectories of longitudinal data from age-heterogeneous samples to model change across participants' ages instead of measurement occasions (Duncan et al., 1996; Joiner et al., 2018). From an analytic perspective, accelerated longitudinal designs use participants' measured ages, as opposed to study measurement occasions, as the longitudinal time index. Thus, employing an accelerated longitudinal design enabled the estimation of generative concern's trajectory across the sample's age range (40–84) instead of 10 measurement occasions.

Specifically, we tested whether generative concern follows a (i) linear, (ii) quadratic, or (iii) cubic trajectory across adulthood. First, given that generative personality characteristics increase across adulthood (Newton et al., 2019), generative concern may, too, follow a positive, linear trajectory. Second, given that later midlife individuals tend to report higher levels of generative concern than younger and older individuals (Keyes & Ryff, 1998), and that generative capacity and enactment theoretically peak in midlife (McAdams & de St. Aubin, 1992; Stewart & Vandewater, 1998), generative concern may follow a quadratic trend, peaking in later midlife and then declining. Finally, given that Einolf (2014) found that generative concern increases from young adulthood into early midlife, does not change across the remainder of midlife, and decreases in later life, generative concern may follow a cubic trend, which would entail two points of curvature in its trajectory.

Comparing these models indicated which change function best represented that of generative concern.

Design and Methods

Participants

The current sample comprised 1,079 mid- to later life individuals who participated in Waves 1–10 (2005–2014) of the Notre Dame Study of Health & Well-being, a longitudinal study of adult development and aging (NDHWB; Whitehead & Bergeman, 2014). Data collection for this study underwent and received approval from the Notre Dame Institutional Review Board (protocol #17-08-4043). NDHWB participants were invited to complete annual, self-reported questionnaires assessing an array of psychosocial factors. Additional participants were recruited into the study until Wave 9 (2013), meaning individuals were eligible to participate in anywhere from 2 to 10 waves. Thus, the NDHWB employed an unstructured, planned missing data design. On average, NDHWB participants completed 4.99 ($SD = 3.27$) questionnaires.

At the first measurement occasion, participants who completed 10 questionnaires ($n = 186$) did not differ significantly from participants who completed one questionnaire ($n = 198$) in terms of age (Welch's $t_{(371.94)} = -1.51$, $p = .132$), education level ($p = .121$, Fisher exact test; because this analysis involved a large 2×8 contingency table, the p value was computed by Monte Carlo Simulation), or annual household income ($\chi^2_{(6)} = 3.24$, $p = .779$). There were, however, differences between these groups in terms of gender ($\chi^2_{(1)} = 4.10$, $p = .043$; because this analysis involved a 2×2 contingency table, the Yates' Continuity Correction was applied) and racial identity ($p = .036$, Fisher exact test). Of those who either participated in 1 or 10 waves of the NDHWB, women were more likely to participate in 10 waves (53%) than 1 wave (47%), whereas men were more likely to participate in 1 wave (58%) than 10 waves (42%). Those who identified as Hispanic/Latin American or White/Caucasian were equally likely to participate in either 1 or 10 waves, with 50%–52%, respectively, remaining in the study for 10 years. Thirty-three percent of participants who identified as either Black/African American or Native American/Aleutian Islander/Eskimo stayed in the study for 10 years as opposed to one. Finally, the one person who identified as Asian/Pacific Islander in either group completed 10 waves.

For inclusion in the present analyses, participants were required to have provided information on generative concern for a minimum of two measurement occasions. We also truncated the sample to include data points across ages 40–84. We made this decision based on our sample's age distribution, as data points were sparse (<20) at the extreme ends of the distribution. Inclusion of younger (range = 31–39) and older (range = 85–99) ages in analyses derived the same conclusions, although estimation was less precise. Therefore, the final analytic

sample included 861 individuals who participated in at least two waves of the NDHWP at ages ranging from 40 to 84. At the first measurement occasion, the sample was in mid- to later life ($M_{\text{Age}} = 58.74$, $SD_{\text{Age}} = 9.21$, range = 35–79), and 60.63% participants were female (see Table 1 for further demographic information). Individuals included in analyses ($n = 861$) did not differ from excluded individuals ($n = 218$) in terms of age (Welch's $t_{(284,84)} = -0.20$, $p = .841$), education level ($p = .501$, Fisher exact test; because this analysis involved a large 2×8 contingency table, the p value was computed by Monte Carlo Simulation), or annual household income ($\chi^2_{(6)} = 3.31$, $p = .769$) at the first measurement occasion. A slightly higher percentage of NDHWP participants who were female (86%) were included in analyses than those who were male (77%; $\chi^2_{(1)} = 4.65$, $p = .031$; because this analysis involved a 2×2 contingency table, the Yates' Continuity Correction was applied). There were also significant differences between those included and excluded from the current analyses in terms of racial identity ($p = .045$, Fisher exact test). Among NDHWP participants who identified as White/Caucasian ($n = 880$), Black/African American ($n = 126$), and Hispanic/Latin American ($n = 28$), 25% or less were excluded from the current analyses. Among those who identified as Native American/Aleutian Islander/Eskimo ($n = 6$), 33% were excluded from the current analyses. Finally, among those who identified as Asian/Pacific

Islander ($n = 8$), none were excluded from the current analyses.

Generative Concern Measure

Six items adapted from the LGS (McAdams & de St. Aubin, 1992) measured generative concern. The NDHWP adapted the six items that were used to create the R-LGS in the Midlife in the United States (Brim et al., 2019; Keyes & Ryff, 1998), including "Others would say that I have made unique contributions to society," "I have important skills that I can pass along to others," "Many people come to me for advice," "I feel that other people need me," "I like to teach things to people," and "I have had a good influence on the lives of many people." Participants indicated whether these items were descriptive of their lives holistically by selecting a number from 1 (*strongly agree*) to 4 (*strongly disagree*), deriving a scale range of 6–24. We tested for measurement invariance across midlife (i.e., younger than 65) and later-life individuals (i.e., 65 and older) in generative concern at Wave 1 with a single-factor, multigroup confirmatory factor analysis with the lavaan package (Rosseel, 2012) in R (R Core Team, 2019). A model constraining factor loadings, item intercepts, item residual variances, and latent variable means to be equal across the two age groups fit better (comparative fit index [CFI] = 0.941; Tucker–Lewis index [TLI] = 0.951; root mean square error of approximation [RMSEA] = 0.089) than a configural model freely estimating parameters in each group (CFI = 0.938; TLI = 0.897; RMSEA = 0.129). Thus, items were summed and reverse-scored for use in the present analyses, and higher scores indicated higher generative concern ($M_{\text{Wave 1}} = 17.56$; $SD_{\text{Wave 1}} = 2.88$). The scale demonstrated reasonable internal consistency reliability ($\omega_{\text{Wave 1}} = 0.89$; R Core Team, 2019; Revelle, 2018).

Analytic Approach

A series of nested, two-level multilevel models were used to estimate generative concern's developmental trajectory. Following an accelerated longitudinal design, we modeled generative concern's trajectory across the sample's longitudinal age range (40–84) instead of the NDHWP's 10 measurement occasions (Duncan et al., 1996; Joiner et al., 2018). NDHWP participants completed the questionnaires across the same calendar years (2005–2014), but were recruited into the study between ages 31 and 91. These 31- to 91-year olds were followed up for 10 years, meaning the NDHWP comprises several overlapping 10-year aging trajectories that span from early midlife into later life. The current study included data points across ages 40–84 throughout the follow-up period, enabling the estimation of generative concern's trajectory across 45 years of life instead of 10 calendar years.

Table 1. Wave 1 Sample Demographic Characteristics

	N	%
Race	853	
White	711	83.35
Black and/or African American	95	11.14
Hispanic and/or Latin American	23	2.70
Native American or Aleutian Islander/Eskimo	4	0.47
Asian or Pacific Islander	8	0.94
Other	12	1.41
Educational attainment	617	
Grade school	2	0.32
Middle school	17	2.76
High school	198	32.09
Vocational school	47	7.62
Some college classes	156	25.28
College degree	110	17.83
Post-college professional degree	38	6.16
Graduate, medical, or law degree	49	7.94
Annual household income	601	
<\$7,500	24	3.99
\$7,500–\$14,999	71	11.81
\$15,000–\$24,999	91	15.14
\$25,000–\$39,999	145	24.13
\$40,000–\$74,999	177	29.45
\$75,000–\$99,999	46	7.65
>\$100,000	47	7.82

We fit a series of nested models with increasingly complex change functions, specifically examining whether generativity remained stable (Model 0), changed linearly (Model A), changed quadratically (Model B), or changed cubically (Model C; Joiner et al., 2018). All models were fit in SAS Proc Mixed (Singer, 1998), which employs maximum likelihood estimation, assuming data are missing at random. In all growth models, age was centered at 40 and then divided by 10. In this way, the intercepts of growth models represent the estimated generative concern score at age 40, the youngest age included in the current analyses. Furthermore, change parameters represent the rate of change by decade (Joiner et al., 2018). The first model was a no-change model (Model 0), specified at Level 1 as:

$$Y_{ij} = \pi_{0i} + r_{ij}$$

where person i 's generative concern at time j (Y_{ij}) is estimated by person i 's intercept (π_{0i}), or average generative concern. The second model was a linear growth model (Model A), specified at Level 1 as:

$$Y_{ij} = \pi_{0i} + \pi_{1i}((\text{Age}_{ij} - 40)/10) + r_{ij}$$

where person i 's generative concern at time j (Y_{ij}) is estimated by person i 's intercept (π_{0i}), or level of generative concern at age 40, and linear effect of age (π_{1i}), or individual i 's rate of change across decades. Next, Model B was a quadratic growth model, specified at Level 1 as:

$$Y_{ij} = \pi_{0i} + \pi_{1i}((\text{Age}_{ij} - 40)/10) + \pi_{2i}((\text{Age}_{ij} - 40)/10)^2 + r_{ij}$$

which added the extent of curvature in individual i 's aging trajectory (π_{2i}) to Model A. There are two aging effects in Model B that cannot be interpreted separately. These effects represent individual i 's immediate linear rate of change at age 40 (π_{1i}), as well as the extent of curvature (π_{2i}) in their trajectory (Singer & Willett, 2003). Finally, we fit a cubic growth model (Model C), specified at Level 1 as:

$$Y_{ij} = \pi_{0i} + \pi_{1i}((\text{Age}_{ij} - 40)/10) + \pi_{2i}((\text{Age}_{ij} - 40)/10)^2 + \pi_{3i}((\text{Age}_{ij} - 40)/10)^3 + r_{ij}$$

which added individual i 's cubic effect of age (π_{3i}) to Model B. There are now three aging effects in Model C that cannot be interpreted separately. These effects represent individual i 's immediate rate of linear change at age 40 (π_{1i}), as well as the first (π_{2i}) and second points of change (π_{3i}) in their trajectory. Note that Model A and Model B are nested within Model C, making Model C the Full Model. The Full Model's (Model C) Level 2 equation was specified as follows:

$$\pi_{0i} = \beta_{00} + \xi_{0i}$$

$$\pi_{1i} = \beta_{10} + \xi_{1i}$$

$$\pi_{2i} = \beta_{20}$$

$$\pi_{3i} = \beta_{30}$$

in which β_{00} represents the average intercept, or average generative concern level at age 40, β_{10} represents the average immediate rate of linear change at age 40, β_{20} represents the average first point of change, or "trough," in generative concern's trajectory, and β_{30} represents the average second point of change, or "peak," in the generative concern's trajectory (Singer & Willett, 2003, p. 216). Interindividual differences in the intercept and immediate rate of change were freely estimated (ξ_{0i} and ξ_{1i} , respectively). Employing a model-comparison approach, we selected the best fitting change function as the Final Model with likelihood ratio tests.

The trajectory derived from the Final Model can only be interpreted as developmental change in the absence of birth cohort effects in each growth parameter (Joiner et al., 2018; Miyazaki & Raudenbush, 2000), including the average intercept, immediate rate of linear change at age 40, and both points of change in generative concern's trajectory. To test for birth cohort effects in Model C (Model D), the Level 2 equation was specified as follows:

$$\pi_{0i} = \beta_{00} + \beta_{01}(\text{Wave 1 Age} - 58.74) + \xi_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{Wave 1 Age} - 58.74) + \xi_{1i}$$

$$\pi_{2i} = \beta_{20} + \beta_{21}(\text{Wave 1 Age} - 58.74)$$

$$\pi_{3i} = \beta_{30} + \beta_{31}(\text{Wave 1 Age} - 58.74)$$

The parameters from Model C, including β_{00} , β_{10} , β_{20} , and β_{30} , represent the average intercept, immediate rate of linear change at age 40, as well as the first and second points of change in the trajectory, respectively. The new parameters in Model D, namely β_{01} , β_{11} , β_{21} , and β_{31} , however, represent average birth cohort differences in the intercept, immediate rate of change at age 40, as well as the first and second points of change in the trajectory, respectively. We grand-mean centered individuals' age at the first measurement occasion, centering individuals' Wave 1 age around the sample mean, 58.74. Likelihood ratio and Wald tests were used to determine whether there were significant birth cohort effects in the growth parameters. Although a significant likelihood ratio test would indicate existing birth cohort effects, these tests tend to select more complex models (Miyazaki & Raudenbush, 2000). Thus, Wald tests were examined to rule out cohort effects in each parameter estimate. If the Wald tests for each of the cohort effects were not significant, the model without cohort effects was retained as the Final Model (Joiner et al., 2018).

Results

Descriptive Statistics

Age and generative concern at Wave 1 were unrelated ($r = 0.01$, $p = .764$). Additionally, generative concern was relatively stable, as represented by the high autocorrelation at all measurement points ($r \geq 0.51$, $p < .001$). Thus,

individuals with higher levels of generative concern tended to have higher levels across the study period.

Primary Analyses

We tested a series of nested models to determine whether generative concern remained stable (Model 0), changed linearly (Model A), changed quadratically (Model B), or changed cubically (Model C) across ages 40–84 (Table 2). First, a likelihood ratio test indicated that Model A fit significantly better than Model 0 ($\chi^2_{(3)} = 34, p < .001$), indicating that a linear change function explains more variance in generative concern's trajectory than a no change function. Although Model B did not fit significantly better than Model A ($\chi^2_{(1)} = 0.2, ns$), Model C fit significantly better than Model A ($\chi^2_{(2)} = 13.1, p < .01$). Therefore, Model C, which estimated a cubic trajectory of generative concern across ages 40–84, was selected as the Final Model in the current analyses (see Table 3 for parameter estimates). A pseudo- R^2 statistic, which was calculated by squaring the correlation between observed and predicted values of generative concern, indicated that the Final Model explained 73% of the total variation in generative concern (Singer & Willett, 2003).

Next, we fit Model D to rule out cohort effects in the Final Model's parameters. Although a likelihood ratio test indicated that Model D fit significantly better than Model C ($\chi^2_{(4)} = 15.7, p < .01$), none of the Wald tests for cohort differences in the parameters were significant (Table 3). Because there was insufficient evidence for cohort effects, we can interpret generative concern's cubic trajectory derived from Model C as developmental change across ages 40–84 (Figure 1). Specifically, generative concern peaks at age 40, declines slightly thereafter until it stabilizes across ages 50–70, and finally declines across ages 70–84.

Discussion and Implications

Although relatively stable, generative concern followed a cubic developmental trajectory across ages 40–84. Because there was insufficient evidence to support cohort differences in the parameters of this cubic trajectory, the change in generative concern that is depicted in Figure 1 can be interpreted as occurring due to a developmental process. Across ages 40–84, generative concern is at its highest at age 40. It declines thereafter, holding relatively stable

across approximately ages 50–70. After age 70, however, generative concern declines steadily until age 84. Thus, generative concern is at its highest in early midlife, declining only slightly before reaching a stable level across the remainder of midlife. Across later life, however, generative concern steadily declines.

Considering generativity is linked to health and well-being across adulthood, the steady decline in generative concern across later life is puzzling. Given that a shift in priorities occurs as individuals age (Carstensen et al., 1999), perhaps older individuals simply begin to prioritize goals other than generativity. Indeed, Grossman and Gruenewald (2020) found that failure to meet expectations for generativity, operationalized as the extent to which they have contributed to the welfare of others, was linked with lower life satisfaction, but this relationship was stronger in midlife and young-old individuals (i.e., individuals younger than 75) than it was in old-old individuals (i.e., individuals aged 75 and older). Such a goal shift may be more nuanced, however, as Lang and Carstensen (2002) found that older adults prioritized generative and emotion regulatory goals, whereas younger adults prioritized social acceptance and autonomy goals. Notably, motivation for generativity involves a desire for both *communion* (i.e., to nurture others) and *symbolic immortality* (i.e., to make one's mark on the world; McAdams & de St. Aubin, 1992). Given the prioritization of generativity and emotion regulation in older adults, Lang and Carstensen (2002) speculated that age differences in generative priorities may be due to older individuals' increase in communion desires. Indeed, the current study's generative concern measure included several items addressing themes of communion (e.g., "I feel that other people need me"), as well as symbolic immortality (e.g., "Others would say that I have made unique contributions to society"). Perhaps the finding of later-life decline in generative concern is due to a decline in desire for symbolic immortality, but not communion.

Another possibility for later-life decline in generative concern is that older adults have fewer opportunities, and thus, *capacity*, to be generative (Stewart & Vandewater, 1998). In comparison to midlife and young-old individuals who may be parenting or in the workforce, older individuals may simply have less access to younger generations. Recent intervention work suggests that older adults' generativity is changeable, however, upon volunteering with younger

Table 2. Model Fit Statistics

	Model 0	Model A	Model B	Model C ^a	Model D
–2 Log likelihood	21,735.8	21,701.8	21,701.6	21,688.7	21,673.0
Akaike information criterion	21,741.8	21,713.8	21,715.6	21,704.7	21,697.0
Corrected Akaike information criterion	21,741.8	21,713.8	21,715.6	21,704.7	21,697.0
Bayesian information criterion	21,756.1	21,742.3	21,748.9	21,742.7	21,754.1

^aFinal Model.

Table 3. Final Model Parameter Estimates

	Model C		Model D	
	Estimates	SE	Estimates	SE
Fixed effect estimates				
β_{00} Intercept	18.75***	0.37	19.35***	1.88
β_{10} Immediate rate of change	-1.75***	0.52	-1.17	2.40
β_{20} First turning point	0.84***	0.24	0.13	1.04
β_{30} Second turning point	-0.13***	0.04	0.02	0.15
β_{01} Age			0.08	0.11
β_{11} Immediate rate of change $\times$ Age			-0.02	0.11
β_{21} First turning point $\times$ Age			0.02	0.03
β_{30} Second turning point $\times$ Age			-0.01	0.00
Variance/covariance estimates				
ξ_{0i} Variance of intercept	9.73***	1.28	9.73***	1.27
ξ_{1i} Variance of immediate rate of change	0.79***	0.20	0.79***	0.19
ξ_{01} Covariance	-2.06***	0.49	-2.07***	0.48
r_{ij} Residual variance	2.57***	0.06	2.57***	0.06

Note: SEs and t values reflect those of the Final Model.

*** $p < .001$.

Figure 1. Estimated change trajectory for generativity with 95% confidence intervals. Note that the age metric is centered in a way that each unit represents a decade, beginning at age 40. Thus, on the x-axis, age 0 represents age 40, age 1 represents age 50, age 2 represents age 60, age 3 represents age 70, and age 4 represents age 80.

individuals (Gruenewald et al., 2016). Indeed, older adults assigned to volunteer experiences with intergenerational components reported higher generativity than other volunteers whose assignment did not have intergenerational components. Moreover, this relation was experience-dependent; the more individuals volunteered, the more their generativity increased. Thus, increasing access to younger generations through volunteer work may positively affect individuals' generativity. The current findings, which indicate a decline in generative concern after age 70, underscore the importance of such intervention work for adults aged 70 and older.

The current findings of gradual, step-wise decline across mid- to later life stand in opposition to those of Newton et al.'s (2019) study, which indicated that generative concern increased from age 43 to 74. The differences in operational definitions of generativity between the current study and that of Newton et al. (2019), however,

may drive these divergent findings. Newton et al. (2019) specifically measured personality factors that are characteristic of highly generative individuals, whereas we measured individuals' self-perceptions of generative concern. Furthermore, we included several different birth cohorts in the current study, whereas they only studied the change in generative concern in a single sample of highly educated, female college graduates. It is possible that generative concern *would* increase in such a specific sample, given that attaining higher levels of education may lead to more opportunities to cultivate generative concern as we age. Indeed, Keyes and Ryff (1998) found that individuals with higher levels of education reported higher generative concern than those with lower levels of education. Perhaps Newton et al.'s (2019) sample had a higher capacity to be generative due to their education level, driving the linear increase in generativity across adulthood. Both methodological differences may derive these conflicting findings.

The current findings also elucidate the mean-level changes in generative concern reported by Einolf (2014). Specifically, Einolf (2014) found that across a 10-year interval, generative concern increased in men aged 24–29 and decreased in individuals aged 60–69. Mean levels of generative concern did not change in individuals who were in their 30s through 50s, as well as those in their 70s, however, at the first measurement occasion. The increase in generative concern from young adulthood (24–29) to later adulthood (30–39) in Einolf's (2014) study seems to corroborate our finding that generative concern is highest at age 40. Perhaps younger individuals have the desire to be generative (Stewart & Vandewater, 1998), which motivates them to act upon on their generative concern as soon as they have the opportunities or capacity to be generative,

which typically occurs in early midlife (McAdams & de St. Aubin, 1992).

Curiously, Einolf (2014) found an earlier decline in generative concern than that of the current study, specifically in individuals aged 60–69. In contrast, we found that generative concern is relatively stable across ages 50–70, declining thereafter until age 84. These disparate findings could be due to our different analytic approaches. Einolf (2014) grouped their participants by age and then tested for mean-level change between two measurement occasions with paired-sample *t* tests. The nature of mean-level change was then compared across the age groups. Because this study only incorporated two measurement occasions, cohort effects may or may not have driven the differences in mean-level change across the age groups. In contrast, however, we fit a series of models testing different change functions for generative concern across age instead of measurement occasions. We also directly tested for cohort effects and did not find evidence for their presence. Thus, we modeled change in generative concern as a function of the aging process, whereas they examined age differences in mean-level change in generative concern across 10 years.

There are many strengths to the current methodology, including a large analytic sample, broad age span, multiple measurement occasions, and straightforward analytic approach. Despite these strengths, however, several important limitations must also be considered. First, we were only able to examine one dimension of generativity in the NDHWP, generative concern. Although generative concern is considered the central facet of becoming generative (McAdams et al., 1998), future studies may find that other dimensions develop differently due to the aging process (Stewart & Vandewater, 1998). Furthermore, our generative concern index, a short-form LGS (Brim et al., 2019; McAdams & de St. Aubin, 1992), may have limited the scope of generative concern. Notably, however, this set of items is widely used (Schoklitsch & Baumann, 2012), rendering our findings directly comparable to those of extant studies. Next, the decline in generative concern from age 40 to 84 was modest. Even though the cubic model explained the outcome variation well, generative concern was relatively stable across the study period. Therefore, results must be interpreted in the context of high stability. Finally, because we did not assess younger adults' generative concern, future studies might investigate how generative concern changes across this life-span stage to build on the current findings.

Conclusions

After decades of theory, the current study modeled the cubic trajectory of generative concern. Although generative concern development is occurring in the context of relatively high stability, empirical support of decade-old theory is not only informative to basic researchers but also has real-life applications. Given generative concern's ties to well-being

and societal engagement (Jones & McAdams, 2013; Keyes & Ryff, 1998), interventions on later-life individuals' declining generative concern, or even later-midlife individuals' generative concern before such decline, may ultimately bolster individual flourishing and improve society.

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Conflict of Interest

None declared.

References

- Ackerman, S., Zuroff, D. C., & Moskowitz, D. S. (2000). Generativity in midlife and young adults: Links to agency, communion, and subjective well-being. *International Journal of Aging and Human Development*, 50(1), 17–41. doi:10.2190/9f51-lr6t-jhrj-2qw6
- Brim, O. G., Baltes, P. B., Bumpass, L. L., Cleary, P. D., Featherman, D. L., Hazzard, W. R., Kessler, R. C., Lachman, M. E., Markus, H. R., Marmot, M. G., Rossi, A. S., Ryff, C., & Shweder, R. A. (2019). *Midlife in the United States (MIDUS 1), 1995–1996*. Inter-university Consortium for Political and Social Research [distributor]. doi:10.3886/ICPSR02760.v18
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54(3), 165–181. doi:10.1037/0003-066x.54.3.165
- Duncan, S. C., Duncan, T. E., & Hops, H. (1996). Analysis of longitudinal data within accelerated longitudinal designs. *Psychological Methods*, 1(3), 236–248. doi:10.1037/1082-989x.1.3.236
- Einolf, C. J. (2014). Stability and change in generative concern: Evidence from a longitudinal survey. *Journal of Research in Personality*, 51, 54–61. doi:10.1016/j.jrp.2014.04.003
- Erikson, E. H. (1963). *Childhood and Society* (2nd ed.). W. W. Norton & Company.
- Grossman, M. R., & Gruenewald, T. L. (2020). Failure to meet generative self-expectations is linked to poorer cognitive-affective well-being. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 75(4), 792–801. doi:10.1093/geronb/gby069
- Gruenewald, T. L., Liao, D. H., & Seeman, T. E. (2012). Contributing to others, contributing to oneself: Perceptions of generativity and health in later life. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 67(6), 660–665. doi:10.1093/geronb/gbs034
- Gruenewald, T. L., Tanner, E. K., Fried, L. P., Carlson, M. C., Xue, Q. L., Parisi, J. M., Rebok, G. W., Yarnell, L. M., & Seeman, T. E. (2016). The Baltimore Experience Corps Trial: Enhancing generativity via intergenerational activity engagement in later life. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 71(4), 661–670. doi:10.1093/geronb/gbv005

- Joiner, R. J., Bergeman, C. S., & Wang, L. (2018). Affective experience across the adult lifespan: An accelerated longitudinal design. *Psychology and Aging*, 33(3), 309–412. doi:[10.1037/pag0000257](https://doi.org/10.1037/pag0000257)
- Jones, B. K., & McAdams, D. P. (2013). Becoming generative: Socializing influences recalled in life stories at midlife. *Journal of Adult Development*, 20, 158–172. doi:[10.1007/s10804-013-9168-4](https://doi.org/10.1007/s10804-013-9168-4)
- Keyes, C. L. M., & Ryff, C. D. (1998). Generativity in adult lives: Social structural contours and quality of life consequences. In D. P. McAdams & E. de St. Aubin (Eds.), *Generativity and adult development: How and why we care for the next generation* (pp. 227–263). American Psychological Association.
- Lang, F. R., & Carstensen, L. L. (2002). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging*, 17(1), 125–139. doi:[10.1037/0882-7974.17.1.125](https://doi.org/10.1037/0882-7974.17.1.125)
- McAdams, D. P., & de St. Aubin, E. (1992). A theory of generativity and its assessment through self-report, behavioral acts, and narrative themes in autobiography. *Journal of Personality and Social Psychology*, 62(6), 1003–1015. doi:[10.1037/0022-3514.62.6.1003](https://doi.org/10.1037/0022-3514.62.6.1003)
- McAdams, D. P., de St. Aubin, E., & Logan, R. L. (1993). Generativity among young, midlife, and older adults. *Psychology and Aging*, 8(2), 221–230. doi:[10.1037/0882-7974.8.2.221](https://doi.org/10.1037/0882-7974.8.2.221)
- McAdams, D. P., Hart, H. M., & Maruna, S. (1998). The anatomy of generativity. In D. P. McAdams & E. de St. Aubin (Eds.), *Generativity and adult development: How and why we care for the next generation* (pp. 7–43). American Psychological Association.
- Miyazaki, Y., & Raudenbush, S. W. (2000). Tests for linkage of multiple cohorts in an accelerated longitudinal design. *Psychological Methods*, 5(1), 46–63. doi:[10.1037/1082-989x.5.1.44](https://doi.org/10.1037/1082-989x.5.1.44)
- Newton, N. J., Stewart, A. J., & Vandewater, E. A. (2019). “Age is opportunity”: Women’s personality trajectories from mid-to-later life. *Journal of Research in Personality*, 80, 43–54. doi:[10.1016/j.jrp.2019.04.005](https://doi.org/10.1016/j.jrp.2019.04.005)
- R Core Team. (2019). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing.
- Revelle, W. (2018). *psych: Procedures for personality and psychological research*. Northwestern University.
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48(2), 1–36. doi:[10.18637/jss.v048.i02](https://doi.org/10.18637/jss.v048.i02)
- Schoklitsch, A., & Baumann, U. (2012). Generativity and aging: A promising future research topic? *Journal of Aging Studies*, 26, 262–272. doi:[10.1016/j.jaging.2012.01.002](https://doi.org/10.1016/j.jaging.2012.01.002)
- Singer, J. D. (1998). Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics*, 24(4), 323–355. doi:[10.3102/10769986023004323](https://doi.org/10.3102/10769986023004323)
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press.
- Stewart, A. J., & Vandewater, E. A. (1998). The course of generativity. In D. P. McAdams & E. de St. Aubin (Eds.), *Generativity and adult development: How and why we care for the next generation* (pp. 75–100). American Psychological Association.
- Whitehead, B. R., & Bergeman, C. S. (2014). Ups and downs of daily life: Age effects on the impact of daily appraisal variability on depressive symptoms. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 69(3), 387–396. doi:[10.1093/geronb/gbt019](https://doi.org/10.1093/geronb/gbt019)