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Does Psychological Well-Being Change with Age?:

Longitudinal Tests of Age Variations and Further Exploration of the Multidimensionality of Ryff's Model of Psychological Well-Being

Kristen W. Springer[1], **Tetyana Pudrovska**[2], and **Robert M. Hauser**[3]

[1] Department of Sociology, Rutgers University and Robert Wood Johnson Foundation Health and Society Scholars Program, Columbia University

[2] Department of Sociology and Population Research Center, University of Texas at Austin

[3] Department of Sociology and Center for Demography of Health and Aging, University of Wisconsin-Madison

Abstract

Using two population-based surveys, we provide the first test of longitudinal age variations in Ryff's scales of psychological well-being (RPWB) across three midlife to later-life transitions. Through these analyses we explore: (a) age variation in RPWB, (b) the structure of RPWB, and (c) the potential for methodologically driven age patterns. In general, RPWB dimensions do not consistently exhibit distinct age profiles; further, longitudinal age variations are exceptionally small, never accounting for more than four percent of the variance. We observe far greater variation *within* ages or periods than *between* subscales across age or time – providing strong evidence against substantively different age profiles of RPWB. Moreover, heterogeneity among positively and negatively worded items yield varied age patterns indicating that age variations of RWPB could be driven, at least in part, by methodological artifacts rather than maturation.

Drawing from the perspective of eudaimonic well-being, Ryff (1995) suggested a multidimensional model of psychological well-being that comprises six distinct dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance that supposedly vary in meaningful ways by personal characteristics including age (Ryff, 1989a, b). Our analysis pursues substantive and methodological objectives: (a) assess the direction and magnitude of life course changes in psychological functioning related to aging and maturational processes, and (b) contribute to recent studies of the structure of RPWB by examining the extent to which the six dimensions exhibit different age profiles and the degree to which methodological variations (positive/negative item phrasing) can affect age variations (Abbott et al., 2006; Ryff & Keyes, 1995; Ryff & Singer, 2006; Springer & Hauser, 2006; Springer, Hauser, & Freese, 2006). We analyze data from two large, independent, longitudinal surveys: Midlife in the United States (MIDUS) and the Wisconsin Longitudinal Study (WLS), each of which assessed RWPB on two occasions, about a decade apart.

Address correspondence to Kristen W. Springer, 54 Joyce Kilmer Avenue, Rutgers University, Department of Sociology, Piscataway, NJ 08854; kspringer@sociology.rutgers.edu.
*Springer and Pudrovska contributed equally to this work.

Extant research on age-related variation in RPWB has been based on cross-sectional data and, thus, has tended to confound *inter*- and *intra*-cohort variation (Clarke, Marshal, Ryff, & Rosenthal, 2000; Ryff, 1989b; Ryff & Keyes, 1995; Ryff, Keyes, & Hughes, 2003). Furthermore, age variation results are generally not consistent across studies (Ryff 1989a, b). Building on these past projects, we are the first we know of to estimate true maturation changes in RPWB among real cohorts of men and women at three life-course transitions.

Examining longitudinal age variations in RPWB also provides an opportunity for further assessment of the structure of RPWB. The six dimensions of RPWB have been theoretically proposed to measure distinct aspects of well-being. However, scholars using multiple datasets from different countries have found little empirical support for the proposed multidimensionality of RPWB (Abbott et al., 2006; Springer & Hauser, 2006; VanDierendonck et al., 2008). For example, Springer and Hauser (2006) observed that latent variable correlations among personal growth, purpose in life, environmental mastery, and self-acceptance approached 1.00 in three large surveys, indicating almost complete overlap in these subdimensions.

In the current project, we examine age-related patterns of RPWB using longitudinal data for three life-course transitions: from adulthood to early midlife, from early midlife to late midlife, and from late midlife to old age. We study these life-course changes using two waves of data that are 10 years apart – long enough to study age effects but short enough to have minimal period effects. Substantively, our project sheds light on life-course change or continuity in eudaimonic well-being. Methodologically, it adds to the debate about multidimensionality of RPWB. If the six dimensions vary differently by age, this suggests that they reflect different aspects of well-being. If their longitudinal age profiles are similar, this is further evidence of fewer than six dimensions. Further, if age variations vary by positive/negative phrasing of items, this highlights the importance of accounting for heterogeneity and demonstrates that age variations could be due to measurement rather than maturation. We focus on analyzing changes in sub-scale scores rather than factor loadings, because most research claiming age variations in RPWB focuses on sub-scale variations (i.e. Clarke et al., 2000; Ryff, 1991). By focusing on sub-scales we can therefore directly engage with these prior projects and hopefully shape future research on scale differences.

Methods

Data

The Wisconsin Longitudinal Study (WLS)—Is a long-term study of a random sample of men and women who graduated from Wisconsin high schools in 1957 (Sewell, Hauser, Springer, & Hauser, 2004). The graduates were surveyed in 1957, 1975, 1993, and 2004-2005. Starting in 1977, the WLS has also conducted surveys of randomly selected siblings of the graduates. Because the siblings range from about 10 years younger to 10 years older than the graduates, we use a pooled sample of the WLS graduates and their siblings who participated in the 1993-1994 and 2004-2005 waves of the WLS. A total of 19 items (4 items for purpose in life and 3 items for each of the other five dimensions) that were asked on the 1993-1994 and 2004-2005 mail surveys are the basis of our longitudinal intracohort analysis of the WLS sample (Appendix A).

Midlife Development in the United States (MIDUS)—Is a national, multistage probability sample of non-institutionalized English-speaking American adults first interviewed at age 25-74 in 1995-1996 (MIDUS I) and then re-interviewed in 2004-2006 (MIDUS II). Both rounds of the MIDUS survey included 18 RPWB items administered on mail questionnaires (Appendix A).[1,2]

Variables

Psychological well-being—Response categories are the same in the two WLS waves: "(1) agree strongly, (2) agree moderately, (3) agree slightly, (4) disagree slightly, (5) disagree moderately, (6) disagree strongly." In MIDUS I, each item has seven response categories: "(1) agree strongly, (2) agree somewhat, (3) agree a little, (4) don't know, (5) disagree a little, (6) disagree somewhat, (7) disagree strongly." Yet, in MIDUS II, the label of the middle category was changed to "Neither agree nor disagree" (versus "Don't know" in MIDUS I). To make response categories in the two waves identical and, thus, facilitate longitudinal comparisons, we excluded respondents who chose the midpoint category at least once in at least one wave. Further, removing the middle response category is consistent with common usage of the RPWB items in MIDUS (i.e. Greenfield & Marks, 2004; Keyes, Shmotkin, & Ryff, 2002).[3]

We created three versions of the subscales for each RPWB dimension: a subscale comprising both positively and negatively phrased items (for the main analyses), a subscale comprising positively phrased items only, and a subscale based on negatively phrased items only. Scores for individual items were averaged and, when necessary, items were reverse-coded so that higher scores always corresponded to higher levels of psychological well-being. When data for one or more items were missing, the average was calculated across items that did not have missing data.

Age—We combined the 1993 and 2004 samples of the WLS graduates with the 1994 and 2005 samples of the WLS siblings. The pooled sample comprised 6,943 respondents who were categorized into three age groups based on their age in 1993-1994: 32 - 51 years (n = 604); 52 -56 years, containing mostly graduates (n = 5,883); and 57 - 75 years (n = 457).

Similarly, the MIDUS respondents were divided into the following age categories based on their age in MIDUS I: 32 - 49 years (n = 941); 50 - 59 years (n = 498); and 60 - 75 years (n = 387), for a total of 1,826 respondents. We chose these category boundaries to maximize the comparability with the WLS cohorts.

Analytic Strategy—Our results are based on longitudinal comparisons of RPWB subscale means (two-tailed t-tests and one-way ANOVA).[4] To compare between-year changes across subscales, all mean scores and standard deviations were standardized using the following formula:

$$M_i^{std} = \frac{M_i - M_o}{S_o};\ S_i^{std} = \frac{S_i}{S_o},$$

where M_o is the overall mean for each sample; S_o is the overall standard deviation for each sample; M_i is an individual mean (for every wave); S_i is an individual standard deviation; M_i^{std} is a standardized individual mean; and S_i^{std} is a standardized individual standard deviation.

[1]Please see http://www.ssc.wisc.edu/wlsresearch/ for further information on the WLS and http://www.midus.wisc.edu/ for additional information on MIDUS.
[2]The subscale reliabilities were similar to other studies using shortened versions of RPWB – between .30 and .70 (i.e. An & Cooney, 2006; Keyes, Shmotkin & Ryff, 2002; Ryff & Keyes, 1995).
[3]We did conduct sensitivity tests examining the MIDUS scales including the midpoints. The results were largely – but not always – consistent with results using the scales without midpoints. Noteworthy differences are detailed in the results and discussion sections.
[4]Data analyzed in this project are not weighted.

In this paper, we present our findings as summary tables showing trends rather than specific numbers.

Findings

The findings from the longitudinal analysis of the WLS and MIDUS cohorts are summarized in Table 1. The ages listed refer to 1993-1994 in the WLS and 1995 in MIDUS. Downward arrows denote a statistically significant decline; upward arrows denote a statistically significant increase. The absence of an arrow indicates that this RPWB dimension has not changed significantly between the two waves.

Longitudinal comparisons of means revealed that – with the exception of environmental mastery – the age trends were not consistent across both samples and all life-course transitions. Autonomy declined for each age group between the two waves of the WLS; yet, autonomy increased for all MIDUS cohorts. Personal growth declined with age at every life stage in both samples, with the exception of the middle-aged group in MIDUS where this RPWB dimension remained stable. Positive relations with others increased for most cohorts both in the WLS and MIDUS, but remained stable only in the older WLS age group. Whereas purpose in life decreased for the two younger WLS cohorts, this dimension did not change significantly for the comparable MIDUS cohorts. Yet, purpose in life consistently declined in both WLS and MIDUS older age groups.[5] Self-acceptance decreased at each life-course stage in the WLS; however, the patterns in MIDUS are quite different. Furthermore, self-acceptance remained stable among the youngest and oldest cohorts in MIDUS, while slightly increasing for the middle-aged MIDUS cohort. In sum, the results do not provide compelling, consistent evidence of psychological well-being changes associated with maturation and consequently do not provide support for the multi-dimensionality of RPWB.

Tables 2 and 3 compare scales based on positively and negatively worded items in the MIDUS and the WLS, respectively. Table 2 shows that in each MIDUS age group, positively and negatively worded scales rarely yield consistent age patterns. The inconsistencies are particularly pronounced for autonomy, personal growth, and self-acceptance.[6] Table 3 indicates that positively and negatively worded items are more consistent with each other in the WLS than in MIDUS, with the exception of positive relations and, to a lesser extent, purpose in life. These findings suggest that disparate age patterns in RPWB scales could simply be methodological effects rather than maturation.

Finally, as indicated in the parenthetic entries in Tables 1 - 3, highly statistically significant age-related changes explain a very small proportion of variance in RPWB dimensions – in most cases, less than 1%. That is, even where there is a statistically reliable change in psychological well-being across a decade, that change is negligible relative to inter-individual variability at either the beginning or the end of the decade.

Discussion and Conclusions

Using two large longitudinal surveys of aging, we examined change and continuity in RPWB over an approximately 10-year period, and assessed the structure of RPWB by exploring the extent to which the six dimensions exhibited different age profiles. Environmental mastery showed consistent changes across surveys for all groups – regardless

[5]Purpose in life consistently declined across all age groups when examining the subscales including midpoints.
[6]In general, age patterns for positively and negatively worded items were even more inconsistent when examining the subscales with midpoints.

of inclusion or exclusion of the MIDUS midpoint. However, three other dimensions (personal growth, positive relations with others, and purpose in life) also provided some evidence of consistency across surveys for some of the age groups.

In terms of RPWB structure, Springer and Hauser (2006) and Abbott et al. (2006) showed that in several cross-sectional surveys, personal growth, purpose in life, environmental mastery, and self-acceptance are virtually indistinguishable when corrected for measurement errors. Our analysis reveals that, of these four dimensions, personal growth and purpose in life decline with age in nearly all age groups in each survey. In contrast, the four other RPWB dimensions exhibit distinct age profiles, which may imply that autonomy, environmental mastery, positive relations with others, and self-acceptance reflect distinct domains of positive psychological functioning.

While our findings could suggest maturation-based age-related changes in PWB and distinctness of some RPWB dimensions, we hesitate to draw firm conclusions for at least two reasons. First, we observe the confounding effects of heterogeneity among individual items in RPWB subscales. Scales based on either positively worded or negatively worded items yield different longitudinal age patterns. Second, almost all age-related changes revealed by our analysis are very small, despite their nominal statistical significance in these large surveys. We observed far greater variation *within* ages or periods than *between* subscales across age or time. Between-year changes explain a very small percentage of variance in RPWB dimensions—less than 1% in most cases and never more than 4%.

Therefore, it is not entirely clear to what extent age variation in RPWB reflects substantively meaningful trajectories of eudaimonic well-being across the life course. Whereas some of our findings are nominally consistent with theories that posit life-course trajectories of well-being, we also think it is appropriate to ask whether the observed changes are large enough to support the theoretical attention they have attracted. By the same token, we think that the present findings offer scant support for the proposed multidimensionality of eudaimonic well-being as measured by Ryff's scales of psychological well-being.

Although our project is the first we know of to add insights into the possibility of RPWB maturation effects using population-based longitudinal data, we were limited in several ways including the fact that we are analyzing two time points. When longitudinal data with multiple measures of RPWB become available, we hope scholars will continue investigating whether – and if so, how – RPWB varies across life.

In addition, future research should further examine the utility of including or excluding RWPB midpoints that measure “don't know” or “neither agree nor disagree” – including, as is the case here, when the middle categories are different. We elected to follow common practice and focus on analyses removing these midpoints (i.e. Greenfield & Marks, 2004; Keyes, Shmotkin, & Ryff, 2002), particularly given the different meanings of the midpoints during the two rounds of MIDUS data collection. Although the core findings were largely unchanged regardless of how we treated the midpoint – the results were not identical, underscoring the need for a thoroughly examination of best practices for use of “don't know” and “neither agree nor disagree” midpoints.

Finally, in this project we elected to focus on how values of RPWB subscales – rather than latent factors – change with age. This focus provides an initial rich descriptive assessment of RPWB scale changes and corresponds with most prior research on RPWB and age variation, which focuses on changes in the subscales. An important next step for this research program is to examine whether, and if so how, the latent variables underlying each subscale vary with age. The results of the current project indicate that this future factor analytic work should make certain to account for whether items are positively or negatively worded. This future

research can hopefully provide additional insight into the structure of RPWB across time as well as how life events and aging do or do not shape psychological well-being.

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Appendix A

Items by RPWB Subscale in the WLS and MIDUS

Item	WLS	MIDUS
Autonomy		
*I have confidence in my opinions even if they are *contrary to the general consensus.*	X	
*I have confidence in my *own* opinions, even if they are *different from the way most other people think.*		X
I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.	X	
It's difficult for me to voice my opinions on controversial matters.	X	
I tend to be influenced by people with strong opinions.		X
I judge myself by what I think is important, not by the values of what others think is important.		X
Environmental Mastery		
*I am *quite* good at managing the *many* responsibilities of *my* daily life.	X	
*I am good at managing the responsibilities of daily life.		X
I have difficulty arranging my life in a way that is satisfying to me.	X	
I have been able to create a lifestyle for myself that is much to my liking.	X	
In general, I feel I am in charge of the situation in which I live.		X
The demands of everyday life often get me down.		X
Personal Growth		
I have the sense that I have developed a lot as a person over time.	X	
When I think about it, I haven't really improved much as a person over the years.	X	
I think it is important to have new experiences that challenge how I think about myself and the world.	X	X
For me, life has been a continuous process of learning, changing, and growth.		X
I gave up trying to make big improvements or changes in my life a long time ago.		X
Positive Relations		
I often feel lonely because I have few close friends with whom to share my concerns.	X	
It seems to me that most other people have more friends than I do.	X	
People would describe me as a giving person, willing to share my time with others.	X	X
Maintaining close relationships has been difficult and frustrating for me.		X
I have not experienced many warm and trusting relationships with others.		X
Purpose in Life		
I am an active person in carrying out the plans I set for myself.	X	

Item	WLS	MIDUS
I don't have a good sense of what it is I'm trying to accomplish in life.	X	
I sometimes feel as if I've done all there is to do in life.	X	X
I used to set goals for myself, but that now seems like a waste of time.	X	
Some people wander aimlessly through life but I am not one of them.		X
I live life one day at a time and don't really think about the future.		X
Self-Acceptance		
In general, I feel confident and positive about myself.	X	
When I compare myself to friends and acquaintances, it makes me feel good about who I am.	X	
In many ways, I feel disappointed about my achievements in life.	X	X
When I look at the story of my life, I am pleased with how things have turned out so far.		X
I like most parts of my personality.		X

Note: Items that are asterisked vary somewhat in their wording between WLS and MIDUS. The differences are italicized to help with comparisons.

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Table 1

Longitudinal Intracohort Variation in Six RPWB Dimensions, Positively and Negatively Worded Items Combined: the Wisconsin Longitudinal Study (N = 6,943) and MIDUS (N = 1,826)

RPWB	Age Group I		Age Group II		Age Group III	
	WLS Age 32-51 (n = 603)	**MIDUS Age 32-49 (n = 941)**	**WLS Age 52-56 (n = 5,883)**	**MIDUS Age 50-59 (n = 498)**	**WLS Age 57-75 (n = 457)**	**MIDUS Age 60-75 (n = 387)**
Autonomy	↓** (0.07%)	↑*** (0.69%)	↓** (0.07%)	↑*** (1.16%)	↓* (0.03%)	↑* (0.32%)
Environmental mastery	↑*** (0.26%)	↑*** (0.58%)	↑*** (0.14%)	↑*** (3.33%)	↑*** (0.26%)	↑*** (1.34%)
Personal growth	↓*** (0.65%)	↓*** (1.05%)	↓*** (0.54%)	— (0.00%)	↓*** (0.43%)	↓* (0.63%)
Positive relations with others	↑*** (0.08%)	↑*** (0.95%)	↑*** (0.55%)	↑*** (2.19%)	— (0.00%)	↑* (0.67%)
Purpose in life	↓*** (0.41%)	— (0.00%)	↓** (0.05%)	— (0.00%)	↓*** (0.25%)	↓*** (1.17%)
Self-acceptance	↓*** (0.40%)	— (0.00%)	↓*** (0.38%)	↑* (0.37%)	↓*** (0.24%)	— (0.00%)

Note. Entries in parentheses reflect between-year variance in a respective RPWB dimension based on adjusted R^2 (i.e. the proportion of the variance explained by wave). The ages listed refer to 1993-1994 in the WLS and 1995 in MIDUS. Downward arrows denote a statistically significant decline in a respective dimension; upward arrows denote a statistically significant increase; the absence of an arrow indicates that this RPWB dimension has not changed significantly between the two waves. Asterisks denote significant differences in means:

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$.

Table 2

Longitudinal Intracohort Comparison of Positively and Negatively Worded RWPB Items in MIDUS (*N* = 1,826)

RPWB	Age 32-49 (*n* = 941)		Age 50-59 (*n* = 498)		Age 60-75 (*n* = 387)	
	P	N	P	N	P	N
Autonomy	— (0.00%)	↑*** (1.49%)	— (0.00%)	↑*** (1.89%)	— (0.00%)	↑* (0.41%)
Environmental mastery	— (0.00%)	↑*** (1.22%)	↑*** (1.24%)	↑*** (3.35%)	— (0.00%)	↑*** (2.47%)
Personal growth	↓*** (2.82%)	— (0.00%)	↓* (0.26%)	↑*** (0.98%)	↓*** (3.33%)	— (0.00%)
Positive relations	— (0.00%)	↑*** (0.96%)	↑* (0.27%)	↑*** (2.09%)	— (0.00%)	↑** (0.91%)
Purpose in life	— (0.00%)	— (0.00%)	— (0.00%)	↓* (0.39%)	— (0.00%)	↓*** (1.68%)
Self-acceptance	↓*** (1.80%)	↑*** (1.29%)	↓* (0.27%)	↑*** (3.03%)	↓* (0.60%)	↑*** (2.08%)

Note. "*P*" refers to positively worded items; "*N*" refers to negatively worded items. Entries in parentheses reflect between-year variance in a respective RPWB dimension based on adjusted R^2 (i.e. the proportion of the variance explained by wave). The ages listed refer to 1995. Downward arrows denote a statistically significant decline in a respective dimension; upward arrows denote a statistically significant increase; the absence of an arrow indicates that this RPWB dimension has not changed significantly between the two waves. Asterisks denote significant differences in means:

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$.

Table 3

Longitudinal Intracohort Comparison of Positively and Negatively Worded RWPB Items in the Wisconsin Longitudinal Study (*N* = 6,943)

RPWB	Age 32-51 (*n* = 603)		Age 52-56 (*n* = 5,883)		Age 57-75 (*n* = 457)	
	P	N	P	N	P	N
Autonomy	— (0.00%)	— (0.00%)	↓ ** (0.07%)	↓ * (0.03%)	↓ ** (0.60%)	↓ *** (1.49%)
Environmental mastery	↑ * (0.25%)	↑ * (0.35%)	↑ *** (0.14%)	↑ *** (0.26%)	— (0.00%)	— (0.00%)
Personal growth	↓ * (0.34%)	↓ * (0.20%)	↓ *** (0.54%)	↓ *** (0.43%)	↓ *** (1.71%)	↓ *** (1.60%)
Positive relations	↑ * (0.22%)	— (0.00%)	↑ *** (0.55%)	— (0.00%)	— (0.00%)	↓ * (0.40%)
Purpose in life	— (0.00%)	— (0.00%)	↓ ** (0.05%)	↓ *** (0.25%)	— (0.00%)	↓ ** (0.64%)
Self-acceptance	— (0.00%)	— (0.00%)	↓ *** (0.38%)	↓ *** (0.24%)	↓ *** (1.20%)	↓ ** (0.71%)

Note. "*P*" refers to positively worded items; "*N*" refers to negatively worded items. Entries in parentheses reflect between-year variance in a respective RPWB dimension based on adjusted R^2 (i.e. the proportion of the variance explained by wave). The ages listed refer to 1993-1994. Downward arrows denote a statistically significant decline in a respective dimension; upward arrows denote a statistically significant increase; the absence of an arrow indicates that this RPWB dimension has not changed significantly between the two waves. Asterisks denote significant differences in means:

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$.