

## **Does Psychological Well-Being Change with Age?**

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### ABSTRACT

We contrast cross-sectional age differences in the six dimensions of Ryff's scales of psychological well-being (RPWB) in several large surveys (MIDUS, NSFH, and WLS) with intracohort changes observed across more than a decade in the Wisconsin Longitudinal Study (WLS). The six dimensions of eudaimonic well-being identified by Ryff are personal growth, purpose in life, positive relations with others, self-acceptance, autonomy, and environmental mastery. Our findings reveal that of the six RPWB dimensions, personal growth and purpose in life exhibit similar cross-sectional variation across age groups only in NSFH. Otherwise, cross-sectional age variations in RPWB sub-dimensions are minor, accounting for less than one percent of the variance in the indexes of well-being. Temporal variations estimated in the WLS graduate sample are miniscule, though statistically significant. They account for far less than one percent of the variance in each index of well-being. Because the scope of longitudinal age trajectories in RPWB scales is so narrow, those trajectories have no clear implications for the multidimensionality of RPWB. Indeed, *heterogeneity* among individual scale items should be taken into account in assessing variation in well-being by age and time because scales comprising different items yield different cross-sectional and longitudinal age patterns.

## **Does Psychological Well-Being Change with Age?**

Many theorists today see personality in terms of flexible adaptation over the life course (Moody 2000) and suggest that people bring positive resources to aging, such as a feeling of self-worth, a personal sense of meaning, or a belief in the controllability of the environment.

Psychological well-being is viewed as a fundamental aspect of positive aging and an indispensable component of life-span development and adaptability (Ryff 1989a,b). Using three large surveys, this study examines cross-sectional and longitudinal age differences in the six dimensions of Ryff's scales of psychological well-being (RPWB). Our analysis is complementary to an earlier work of Springer and Hauser (2005), which showed that four of the six PWB dimensions were virtually indistinguishable after correction for measurement error.

Assessing the age-related similarities and differences in the dimensions of PWB can contribute to the debate about the structure of Ryff's scales and the interrelationship among its components (Ryff and Keyes 1995; Kafka and Kozma 2002; Springer and Hauser 2005a,b, Ryff and Singer 2005).

First, we review findings from extant cross-sectional studies documenting age differences in the dimensions of RPWB. Then, we present the results of our analysis contrasting cross-sectional age variation in three major surveys – the Wisconsin Longitudinal Study (WLS), the National Survey of Families and Households (NSFH), and Midlife in the United States (MIDUS) – with true intracohort changes observed across more than a decade in the WLS. Finally, we discuss methodological implications of our findings for the structure of RPWB subscales.

## *Ryff's Model of Psychological Well-Being*

Current research on well-being has been guided by two general perspectives: the *hedonic* approach that defines well-being in terms of pleasure and happiness; and the *eudaimonic* approach, which focuses on self-realization, personal expressiveness, and the degree to which people are able to actualize their abilities (Waterman 1993; Ryan and Deci 2001). Drawing from the eudaimonic perspective, Carol Ryff has described well-being as “the striving for perfection that represents the realization of one’s true potential” (Ryff 1995, p. 100) and suggested a *multidimensional* model of PWB that comprised six distinct dimensions of human actualization: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff 1989a,b).

Each dimension of RPWB reflects different challenges that individuals encounter in the process of adult development. Specifically, people attempt to hold positive attitudes about themselves despite the awareness of their limitations (self-acceptance). They also strive to cultivate warm and trusting interpersonal relationships (positive relations with others) and to modify their environment in order to meet personal needs and preferences (environmental mastery). In maintaining individuality within a social system, people seek a sense of self-determination as well as the ability to resist social pressures (autonomy). Finally, finding meaning in one’s efforts and challenges (purpose in life) and developing one’s potential by growing and expanding as a person (personal growth) are central to RPWB (Keyes, Shmotkin, and Ryff 2002).

Although the six dimensions of RPWB have been theoretically proposed to measure distinct aspects of well-being, Springer and Hauser (2005) find very little empirical support for the conceptually postulated multidimensionality of PWB. They observed that across three large data sets, the highest latent variable correlations were consistently those among purpose in life, self-acceptance, environmental mastery, and personal growth. For example, in 1993 WLS

graduate mail survey data, Springer and Hauser found the following correlations among latent variables: 0.976 between self-acceptance and purpose in life, 0.971 between self-acceptance and environmental mastery, and 0.958 between environmental mastery and purpose in life. Personal growth also correlated highly with self-acceptance (0.951), purpose in life (0.958) and environmental mastery (0.908). Based on these findings, Springer and Hauser conclude that the RPWB scales do not measure six distinct dimensions. Similarly, Kafka and Kozma (2002) failed to support the hypothesis that factor analysis of the items of Ryff's scales should produce a six-factor model.

Our study is a complement to the work of Springer and Hauser. We examine the extent to which the six dimensions of RPWB exhibit similar variation by age. We expect that the four dimensions identified by Springer and Hauser as virtually indistinguishable would show identical age patterns. Additional support for studies arguing that Ryff's scales do not represent six discrete components would be obtained if the six dimensions (or at least some of them) were shown to vary systematically in a similar fashion based on major sociodemographic variables, such as age, gender, or education (Springer and Hauser 2005); we plan to address those questions in subsequent work. If each of Ryff's sub-scales had a distinct pattern of variation according to individuals' sociodemographic characteristics, this would be an indication that the scales indeed measure six distinct constructs (Ryff and Singer 2005). Conversely, if all or some dimensions (especially those that were already shown to be highly correlated in factor analysis) exhibited identical or similar sociodemographic patterns, this might—albeit indirectly—reinforce concerns about the dimensionality of the RPWB scales.

This study attempts to further pursue the question of the interrelationship among the dimensions of RPWB by focusing on their age-related differences and similarities. That is, variation in the subscales of PWB by age and time address two important issues, first, the extent

of life course variation in psychological well-being, and, second, the fundamental factorial structure of psychological well-being.

*Previous Cross-Sectional Studies on Psychological Well-Being and Age*

Theoretically, interest in age variation in well-being is related to psychological formulations of life course development (Neugarten 1973), which emphasize the significance of particular life challenges in the move from young adulthood through middle age into late life (Keyes, Shmotkin, and Ryff 2002). However, despite this conceptual emphasis on life course development, previous studies of age-related changes in psychological well-being have been based overwhelmingly on cross-sectional data. Such studies confound inter-cohort and intracohort variation and thus do not directly address the existence of developmental trajectories.

For example, in a cross-sectional sample of 321 men and women, classified as young adults, middle-aged adults, and older adults and using a 20-item scale for each of the six RPWB dimensions, Ryff (1989b) found that the level of autonomy was significantly greater among middle-aged adults relative to their young peers, but similar among middle-aged and older groups. Environmental mastery was higher among middle-aged and older adults compared to the young age group. The levels of personal growth and purpose in life appeared comparable between young and middle-aged groups, but were significantly lower among older adults. Finally, positive relations with others and self-acceptance were similar across the three age groups.

The cross-sectional findings of Ryff and Keyes (1995) from a sample of 1,108 men and women divided into young, midlife, and older adults revealed significant age increments in autonomy, but only from young adulthood to midlife. Midlife and older adults reported significantly greater environmental mastery scores than the young age group. Personal growth and purpose in life were significantly lower among older adults relative to young and midlife age

groups. In contrast, older respondents had higher positive relations scores than the two younger age groups. Finally, no age differences in self-acceptance were observed.

Using data from the Canadian Study of Health and Aging (age range 68-103) and OLS regression techniques, Clarke, Marshal, Ryff, and Rosenthal (2000) found that autonomy and self-acceptance were not significantly related to age, while environmental mastery, personal growth, purpose in life, and positive relations with others were associated negatively with age.

Ryff, Keyes, and Hughes (2003) reported that among the MIDUS respondents, autonomy, environmental mastery, positive relations with others, and self-acceptance were related positively to age, while personal growth and purpose in life varied negatively with age, net of gender, race, education, employment, marital status, and perceived discrimination.

In a chapter summarizing findings regarding age differences in the RPWB dimensions, Ryff, Kwan, and Singer (2001) conclude that autonomy and environmental mastery tend to increase with age; personal growth and purpose in life decline with age; and positive relations with others and self-acceptance exhibit little age variation.

Thus, studies on age variation in RPWB based on cross-sectional samples document that the six scales tend to vary differently across age groups. Yet, most researchers have looked at synthetic cohorts because the cross-sectional nature of their data did not allow them to examine true intrapersonal changes in psychological well-being as individuals grow older. Thus, it is impossible to ascertain from these studies whether observed age differences reflect maturation and accommodative developmental processes or, alternatively, represent nonchanging differences among birth cohorts (Keyes, Shmotkin, and Ryff 2002).

Using three large surveys, our study explores both cross-sectional and longitudinal age differences in the six dimensions of Ryff's scales of psychological well-being. To our knowledge, this is the first study that uses longitudinal data to examine changes in RPWB in a real cohort over approximately a 10-year period. In addition to longitudinal analysis, we also

look at cross-sectional age patterns to assess the extent to which our cross-sectional findings are consistent with previous studies on age variation conducted mainly by Carol Ryff and associates. Because our analysis is based on both cross-sectional and longitudinal data, we are able to distinguish differences among birth cohorts from intra-individual developmental changes.

## DATA

This study is based on three large samples: the Wisconsin Longitudinal Study (WLS), Midlife Development in the United States (MIDUS), and the National Survey of Families and Households (NSFH).

*WLS.* The WLS is a long-term study of a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. The respondents were first interviewed during their senior year in high school, when they were 17-18 years old (1957). Subsequent interviews were completed at ages 36 (in 1975), 53-54 (in 1993), and 64-65 (in 2004-2005). In 1977, the study design was expanded with the collection of parallel interview data for a random sample of 2,000 siblings of primary respondents. In 1993-1994, four surveys were conducted: telephone and mail surveys of the WLS graduates and similar surveys of their siblings. In 1994, the WLS included samples of about 8,500 graduates and 5,300 siblings. For the cross-sectional analysis, we use the 1993 graduate data and 1994 sibling data, while our longitudinal analysis is based on the 1993 and 2004-2005 data for the WLS graduates.

Items from RPWB scales were included in both the 1993 WLS graduate telephone interview and mail survey. The mail survey contained seven items for each subscale, yielding a total of 42 items (see Appendix A). The mail survey in 2004-2005 included 32 RPWB items: six items for purpose in life and positive relations with others and five items for each of the other four RPWB dimensions. The 1993 and 2004-05 mail surveys have only 19 items in common, that is, included in both mail questionnaires (4 items for purpose in life and 3 items for each of



the other five dimensions). Our intracohort analysis of the WLS sample is based on these 19 repeated items (Appendix A).

*MIDUS*. MIDUS is a multistage probability sample of 3,032 non-institutionalized English-speaking adults between the ages of 25 and 74 years old. There was an oversampling of older respondents and men to guarantee a good distribution on the cross-classification of age and gender. Respondents were recruited by telephone to participate in the survey. They were administered a 30-minute telephone interview, and then a two-part self-administered questionnaire was mailed to them. Data were collected during 1994 and 1995. RPWB was included in one of the mail questionnaires and contained 18 items in what appeared to be a random order.

*NSFH*. The NSFH began in 1987-1988 with a national sample of more than 10,000 households. In each household, a randomly selected adult was interviewed. The five-year follow-up was conducted in 1992 to 1994 and included data collection from 10,000 respondents, 5,600 interviews with spouses/partners, 2,400 interviews with children, and 3,300 interviews with parents. The focus of this project is on the main respondents. The third wave of the NSFH was conducted in 2001-2003. Due to budgetary constraints, only a subset of the Time 1 sample was selected to be re-interviewed; these included parents of young adult children and respondents in mid- to later life. The parent sample was comprised of main respondents with an eligible focal child. The mid-to-later life sample consisted of main respondents who did not have eligible focal children but who were 45 years and older at Time 3. Overall, the NSFH III sample comprises 4,076 main respondents with an eligible focal child and 4,914 main respondents aged 45 years or older with no focal child eligible for the NSFH 2 interviews. RPWB items were included in the self-administered health module and contained the same 18 items as MIDUS arranged in a seemingly random order, though in a different order than MIDUS. We restricted our analysis to main respondents who participated in NSFH II and NSFH III. Among respondents who were 29

or older at NSFH II, 4,190 answered at least one PWB item in both waves. Of those 4,190 respondents, 10 chose the same response category for all items in NSFH II and 11 in NSFH III. Those 21 individuals were excluded from analysis, yielding the final sample of 4,169 participants.

### *Variables*

*Psychological well-being.* NSFH and MIDUS contain the same 18 items with slight wording differences (Appendix B). The WLS mail instrument includes 6 of the 18 NSFH/MIDUS items in addition to 36 other items (Appendix A). Thus, only six RPWB items were included in all three surveys. Those items are: I have confidence in my opinions even if they are contrary to the general consensus (autonomy); I'm good at managing the many responsibilities of my daily life (environmental mastery); It's important to have new experiences that challenge how I think about myself and the world (personal growth); People would describe me as a giving person, willing to share my time with others (positive relations with others); I sometimes feel as if I've done all there is to do in life (purpose in life); In many ways, I feel disappointed about my achievements in life (self-acceptance).

Response categories differ across the surveys. In the WLS and NSFH II surveys, response categories were "(1) agree strongly, (2) agree moderately, (3) agree slightly, (4) disagree slightly, (5) disagree moderately, (6) disagree strongly." The NSFH III respondents were asked to choose among the following categories: "(1) strongly agree, (2) agree, (3) neither agree nor disagree, (4) disagree, (5) strongly disagree." Finally, in the MIDUS sample, response choices ranged from 1 to 7 ("agree strongly, agree somewhat, agree a little, don't know, disagree a little, disagree somewhat, disagree strongly"). For the current project the mid-point "don't know" category was treated as missing data and the response categories were recoded from 1 to 6.

Each dimension of the RPWB scales was measured with both positively and negatively worded items. Positively worded items are those to which individuals should respond “strongly agree” to indicate the highest level of well-being, e.g., “I have confidence in my opinions even if they are contrary to the general consensus,” “People would describe me as a giving person willing to share my time with others.” Negatively worded items are those to which individuals should respond “strongly disagree” to indicate the highest level of well-being, e.g., “I have not experienced many warm and trusting relationships,” “The demands of everyday life often get me down.” To create a scale for each of the six dimensions, scores for responses were averaged across items. All *positively worded items* were *reverse coded*, so higher scores always correspond to higher levels of reported psychological well-being.

*Age, cross-sectional analysis.* We pooled the 1993 sample of the WLS graduates (most of whom were 53-54 years old at the time of the interview) and the 1994 sample of the WLS siblings (whose age at the interview ranged from 29 to 80 years old). Twin non-graduates were excluded from analysis. The pooled sample comprises 10,914 siblings and graduates who are categorized into the following age groups: 29-44 years (n=375); 45-51 years (n=1,163); 52-56 years, containing mostly graduates (n=7,764); 57-64 years (n=1,286); and 65-80 years (n=326).

NSFH II respondents were subdivided into the following five age categories: 29-38 years (n=752); 39-48 years (n=1,580); 49-58 years (n=879); 59-68 years (n=582); 69 years or older (n=376). Note that one of the NSFH age-groups, those aged 49 to 58 in 1992, is centered on the age of the WLS graduates in 1993, and the response categories in those two surveys are identical. The cross-sectional analysis of the NSFH III sample is based on the same groups of respondents who became approximately 10 years older: 39-48 years (n=752); 49-58 years (n=1,580); 59-68 years (n=879); 69-78 years (n=582); 79 years or older (n=376). However, because the response categories are so different between NSFH II and NSFH III, it is not possible to report intracohort comparisons between those two surveys.

Among MIDUS respondents, five age groups were compared to each other: 29-38 (n=823); 39-48 (n=884); 49-58 (n=761); 59-68 (n=560); 69 or older (n=252). We excluded individuals under the age 29 for comparability with the NSFH age categories.

*Age, longitudinal analysis.* The longitudinal analysis of the WLS graduates compares their RPWB scores measured first in 1992-1993 when they were 53-54 years old and then in 2003-2004 they were 64 or 65 years old (n=5,217). Our longitudinal analysis of the WLS sample focuses on the decade between 53-54 years and 64-65 years, which is a transitional period from middle adulthood to late life and, thus, an important developmental stage.

## METHODS

Our results are based on cross-sectional and longitudinal comparisons of mean values of the RPWB subscales (two-tailed t-tests and one-way ANOVA). For the WLS sample, we conducted three types of longitudinal analysis. First, we used all items (both positively and negatively worded) to create the six subscales of PWB. Second, we excluded negatively worded items and created the subscales based only on the positively worded items. Third, we used only the negatively worded items to create subscales.

To compare *between-year* changes in the WLS across subscales comprising all items, positively worded items, and negatively worded items, all mean scores and standard deviations were standardized. First, within each of the six dimensions, we calculated overall means and standard deviations based on both years. Then, for every wave, we obtained individual means and standard deviations, subtracted overall means and divided by their respective overall standard deviations. We used the following formula for standardization:

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

$M_o$  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;  
 $S_i^{std}$  is a standardized individual standard deviation

[INSERT Tables 1-4 about here]

## RESULTS

### *Cross-Sectional Findings*

Cross-sectional findings are presented in Tables 1 through 4. The cross-sectional analysis shows that, overall, *personal growth* and *purpose in life* are lower among older age groups relative to younger ages, but the finding is not so strong and regular as has been reported previously. In the pooled sample of the WLS siblings and graduates, personal growth and purpose in life are slightly greater for the 52-56 age group (containing predominantly graduates) than at other ages. The oldest age group (those aged 65 to 80 years) reported the lowest levels of personal growth and purpose in life. In the MIDUS sample, personal growth does not vary significantly across age categories, while purpose in life is lower in each successive age group ( $p < .001$ ). In both NSFH II and NSFH III data sets, personal growth and purpose in life decline for each successive age category ( $p < .001$ ), and they are lowest among the oldest respondents (69 or older in NSFH II and 79 or older in NSFH III).

The findings from the MIDUS and WLS data reveal that *environmental mastery* and *positive relations with others* tend to be higher in older age groups relative to younger ones ( $p < .001$ ). Similarly, the levels of environmental mastery are higher among the two oldest NSFH II age categories (59-68 years and 69+ years) than among younger respondents ( $p < .001$ ).

However, in NSFH III, this dimension of RPWB does not reveal significant age differences. In the NSFH II sample, positive relations with others increase for each successive age group up to

age 69 but decline for the oldest respondents ( $p < .01$ ). Yet, for the same sample 10 years later (NSFH III) positive relations with others show little age variation up to age 69 and become lower among the oldest age groups (69-78 years and 79+ years).

Among WLS participants, *autonomy* increases for each successive age group up to age 65 and then declines for adults aged 65 to 80 years. In the MIDUS sample, the level of autonomy increases for each successive age group. The NSFH II and NSFH III analyses do not yield consistent patterns: while in the NSFH II sample the levels of autonomy are the highest in the 59-68 age group relative to younger and older ages ( $p < .01$ ), autonomy declines for each successive age category in the NSFH III sample ( $p < .001$ ) when the same respondents became 10 years older.

In the WLS pooled sample, *self-acceptance* tends to increase with age, and the highest levels of self-acceptance are observed in the oldest age group (65-80 years old). In the MIDUS and NSFH II data sets, self-acceptance does not differ significantly by age, while among the NSFH III respondents, this dimension of RPWB is lower among the two oldest age groups ( $p < .001$ ) relative to younger ages.

In sum, our cross-sectional findings show that personal growth and purpose in life are often, but not always lower in older age groups compared to younger ages, while environmental mastery tends to be higher among older adults relative to their younger peers. However, we observe *no* consistent cross-sectional age trends in autonomy, positive relatedness, and self-acceptance: the patterns of age variation in each of these three RPWB dimensions are different in our four cross-sectional samples (WLS, MIDUS, NSFH II, and NSFH III).

Thus, unlike studies conducted by Ryff and associates, our analysis does not yield systematic cross-sectional age variation in three of the six RPWB subscales. It should be noted, however, that previous cross-sectional studies and our additions to those studies cover somewhat

different birth cohorts. To the extent that birth cohort differences drive cross-sectional age variation, age patterns should ideally be compared across the same cohorts.

Moreover, as shown in Table 5, in most of the six subscales of RPWB, cross-sectional age variation is negligible. With four notable exceptions – cross-sectional variation in personal growth and purpose in life in the two NSFH surveys – there is only one case in which age accounts for as much as two percent of the variance in a well-being subscale. In most of the remaining cases, age accounts for less than one percent of the variance in well-being.

However, the exceptions in the two NSFH surveys are striking. In the 1992 survey, age accounts for two percent of the variance in personal growth and four percent of the variance in purpose in life. In the 2002 survey, age accounts for 8.5 percent of the variance in personal growth and 10.5 percent of the variance in purpose in life. These stand out as exceptions relative both to other RPWB subscales in the NSFH surveys and to the same RPWB subscales in MIDUS and the WLS. The exceptions are especially important because they pertain to two of the four subscales that Springer and Hauser (2005) found to be so similar in cross-section surveys. For these reasons, we have looked more closely at the items in the two exceptional subscales.

[INSERT Table 5 about here]

Personal growth is assessed using two positively worded items and one negatively worded item: “It’s important to have new experiences that challenge how I think about myself and the world;” “I gave up trying to make big improvements or changes in my life a long time ago;” and “For me, life has been a continuous process of learning, changing, and growth.” Figure 1 (a, b, and c) shows age-variation in the 1992 and 2002 NSFH surveys in the overall subscale, in a scale based only on positive items, and in the single negative item. As shown in Figure 1a, personal growth declines regularly in both NSFH surveys, but more steeply in 2002 than in 1992. However, the one negatively worded item drives the decline across ages in the 1992 survey

(Figure 1c); there is no decline in the positively worded items in 1992 (Figure 1b). In 2004, there are similar declines in both the positively and negatively worded items.

Purpose in life is assessed using one positively worded and two negatively worded items: “I live life one day at a time and don’t really think about the future;” “I sometimes feel as if I’ve done all there is to do in life;” and “Some people wander aimlessly through life, but I’m not one of them.” Figure 2 (a, b, and c) shows age-variation in the 1992 and 2002 NSFH surveys in the overall subscale, in a scale based only the positive item, and in the negatively worded items. As shown in Figure 2a, purpose in life declines regularly in both NSFH surveys, after the first two age groups (Figure 1a). Again, the decline is steeper in 2002 than in 1992. Here, the two positively worded items actually increase in 1992, and the decline in the positively worded item is substantial in 2002 (Figure 1b). However, the overall change in both years is dominated by a sharp decline with age in the average of the two negatively worded items (Figure 1c).

In the other four dimensions of RPWB, the cross-sectional variations by age in the NSFH data are reasonably consistent across positive and negative items; there is very little variation. Thus, it is difficult to associate the age gradients in personal growth and purpose in life with negative items *per se*, which would be a possibility if older persons are less likely to notice and understand the reverse-scored items. At the same time, we hesitate to draw firm conclusions about age variation in scales whose constituent items behave quite differently.

[INSERT Figures 3 to 8 about here]

### *Longitudinal Findings*

The results from the longitudinal analysis of the WLS cohort are presented in Figures 3 to 8 and summarized in Table 6. We first consider the direction and statistical significance of temporal shifts in each subscale and then discuss the substantive import of the changes. To



anticipate, because the sample size is quite large, very small changes in mean subscale values are statistically significant.

Longitudinal comparisons of means reveal that the WLS graduates report lower levels of *purpose in life* (Figure 3) and *personal growth* (Figure 4) at ages 64-65 than at ages 53-54, regardless of whether the scales comprise all items, positively worded or negatively worded items only. In contrast, environmental mastery (Figure 5) has increased for the WLS graduates over the 10-year period. The WLS longitudinal analysis reveals heterogeneity among the items in *positive relations with others* (Figure 6). The comparison of scales including all items suggests that positive relations with others slightly *increased* between graduates' mid-50s and mid-60s, although this increase is statistically significant at only the 0.05 level (Table 6). When only positively worded items are considered, the age-related increment in this dimension becomes more pronounced, yet a scale consisting only of negatively phrased items shows a *decline* in positive relatedness over time. The WLS data suggest declines in *autonomy* (Figure 7) and in *self-acceptance* (Figure 8) across the decade between respondents' mid-50s and mid-60s.

[INSERT Table 6 about here]

To sum up, longitudinal comparisons of RPWB subscales including *both positively and negatively worded items* indicate that personal growth, purpose in life, autonomy, and self-acceptance decline with age for the WLS cohort, while environmental mastery slightly increases in the period between respondents' mid-50s and mid-60. Positive relations with others do not show a significant change over a decade. However, when either *positively worded or negatively worded items* are excluded from analysis, the longitudinal age trajectories in positive relations with others change in *opposite* directions. This suggests that heterogeneity among individual items should be taken into account in any analysis considering sociodemographic variation in RPWB because scales comprising different items might yield different patterns.

Moreover, as shown in Table 6, we observe enormously greater variation *within* ages than *between* subscales over time. Between-year changes explain a very small percentage of variance in RPWB dimensions (from 0.00% for positive relatedness to 0.66% for personal growth). Despite the nominal *statistical* significance of temporal changes in the well-being subscales among WLS graduates, there are no substantively significant changes in the well-being subscales across more than a decade.

## DISCUSSION AND CONCLUSIONS

This study is an essential complement to earlier work in which Springer and Hauser (2005) showed that, in several cross-section surveys (including the 1993 WLS survey), self-acceptance, purpose in life, environmental mastery, and personal growth are virtually indistinguishable when corrected for errors of measurement. Springer and Hauser's findings were reconfirmed in factor models of longitudinal WLS data (1993 to 2004) and NSFH data (1992 to 2002), which also revealed very high correlations among these four dimensions (Hauser, Springer, and Pudrovska 2005).

We hypothesized that these dimensions might change very similarly with age and time. We found that personal growth and purpose in life exhibited similar cross-sectional variation by age in NSFH II and NSFH III, but not in MIDUS or in the WLS, while other dimensions of RPWB did not reveal consistent age-related patterns. Moreover, cross-sectional age variations in personal growth and purpose in life differed between positively and negatively worded items. With the previously stated exception, cross-sectional age variation in the RPWB subscales is negligible.

Among WLS graduates – the only group for which we could make true longitudinal intracohort comparisons – there were very small, though statistically significant changes in the subscales of psychological well-being. Moreover, longitudinal age trajectories in positive

relations with others varied, depending on whether the scales measuring this dimensions included all available items, positively worded or negatively worded items only. Again, *heterogeneity* among individual items should be taken into account because scales comprising different items tend to yield different longitudinal age patterns.

Our expectations regarding the similarity of age variation were supported for two of the RPWB dimensions (but in only one sample). Almost all of the age-related changes revealed by our analysis are of a very small magnitude (despite statistical significance). We observed far greater variation *within* ages or periods than *between* subscales across age or time. Because the scope of longitudinal age trajectories in Ryff's scales is so narrow, it is possible that age patterns we document are not substantively meaningful and, therefore, do not speak directly to the distinct nature of the dimensions of RPWB.

Because of the inconsistencies in our findings to date, we plan to undertake additional cross-sectional and longitudinal analyses of the PWB subscales as data from the 2004-2005 interviews with WLS siblings become available. That is, we will have new cross-sectional data for a pooled sample of WLS graduates and siblings in 2004-2005, and we will have new longitudinal data for graduates and siblings who participated both in the 1993-1994 and 2004-2005 surveys. In addition, because of the evidence of heterogeneity among RPWB items, we will carry out additional cross-sectional analyses of age variation in the WLS, using the larger sets of RPWB items that are available in 1993-94 or in 2004-05, but not in both years.

Elsewhere, we have estimated longitudinal factor models of the RPWB subscales using the 1993 and 2004-05 waves of the WLS and the 1992 and 2002 waves of NSFH. In the WLS, we find longitudinal factor correlations on the order of .85 for each sub-dimension of psychological well-being, but the correlations range from 0.45 to 0.70 in the NSFH (Hauser, Springer, and Pudrovska 2005). High longitudinal correlations provide complementary evidence of insubstantial change in the RPWB scales across time, but the lower correlations in NSFH than

in the WLS present a genuine puzzle. Another next step will be to examine whether similarities and differences among the six dimensions observed with respect to age will be replicated using other basic social and demographic variables and, in particular, gender, marital status, and socioeconomic status.

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Table 1. Cross-sectional Age Variation in the Six RPWB Dimensions: A Pooled Sample of the WLS Graduates (1992-1993) and Siblings (1994)

RPWB Scales <sup>a</sup>	Age Groups				
	29-44 years (n=375)	45-51 years (n=1,163)	52-56 years (n=7,764)	57-64 years (n=1,286)	65-80 years (n=326)
Autonomy	4.306 <sup>b</sup> (.802)	4.433 (.827)	4.503 (.771)	4.523 (.785)	4.484 (.744)
Environmental Mastery	4.469 (.779)	4.682 (.770)	4.835 (.731)	4.875 (.722)	4.916 (.723)
Personal Growth	4.639 (.781)	4.667 (.791)	4.738 (.797)	4.651 (.854)	4.415 (.897)
Positive Relations	4.635 (.826)	4.796 (.803)	4.877 (.784)	4.896 (.772)	4.870 (.767)
Purpose in Life	4.638 (.830)	4.701 (.854)	4.849 (.816)	4.801 (.874)	4.555 (.868)
Self-Acceptance	4.497 (.938)	4.606 (.907)	4.740 (.856)	4.806 (.850)	4.825 (.827)

<sup>a</sup> Response choices range from 1 to 6. Items were averaged to create each scale.

<sup>b</sup> For each RPWB dimension, differences across the age groups are significant at the .001 level.

Note: Each cell contains means with standard deviations in parentheses

Table 2. Cross-sectional Age Variation in the Six RPWB Dimensions: MIDUS Respondents

RPWB Subscales <sup>a</sup>	Age Groups				
	29-38 years	39-48 years	49-58 years	59-68 years	69+ years
Autonomy	4.603 (.944) n=841	4.683 (.928) n=892	4.840 (.884) n=769	4.875 (.873) n=566	4.877 (.922) n=256
Environmental Mastery	4.526 (.931) n=843	4.490 (.938) n=895	4.617 (.964) n=772	4.783 (.899) n=567	4.802 (.893) n=255
Personal Growth	5.151 (.843) n=843	5.085 (.887) n=893	5.077 (.922) n=772	4.952 (.944) n=567	4.890 (.919) n=255
Positive Relations	4.598 (1.117) n=843	4.425 (1.156) n=896	4.698 (1.136) n=772	4.683 (1.144) n=569	4.778 (1.041) n=256
Purpose in Life	4.829 (.904) n=842	4.706 (1.002) n=895	4.728 (.997) n=772	4.536 (1.073) n=567	4.282 (1.218) n=256
Self-Acceptance	4.639 (1.019) n=843	4.647 (.988) n=894	4.728 (.958) n=772	4.740 (.930) n=567	4.833 (.807) n=252

<sup>a</sup> Response choices range from 1 to 6 (the midpoint 4 “Don’t Know” was treated as missing data, and other response choices were recoded from 1 to 6). Items were summed to create each scale.

Note: Each cell contains means, standard deviations in parentheses, and the number of respondents for each RPWB subscale in each age group.



Table 3. Cross-sectional Age Variation in the Six RPWB Dimensions: NSFH II Respondents

RPWB Scales <sup>a</sup>	Age Groups				
	29-38 years (n=752)	39-48 years (n=1,580)	49-58 years (n=879)	59-68 years (n=582)	69+ years (n=376)
Autonomy **	4.829 (.821)	4.850 (.815)	4.905 (.853)	4.974 (.817)	4.930 (.802)
Environmental Mastery ***	4.552 (.893)	4.557 (.933)	4.624 (.949)	4.809 (.862)	4.799 (.864)
Personal Growth ***	5.133 (.782)	5.096 (.784)	4.972 (.865)	4.885 (.808)	4.736 (.835)
Positive Relations **	4.557 (1.009)	4.600 (1.036)	4.665 (1.035)	4.744 (.998)	4.694 (.981)
Purpose in Life ***	4.707 (.909)	4.690 (.880)	4.557 (.922)	4.350 (.983)	4.088 (.948)
Self-Acceptance	4.593 (.877)	4.633 (.923)	4.604 (.903)	4.631 (.893)	4.668 (.847)

<sup>a</sup> Response choices range from 1 to 6. Items were averaged to create each scale.

Note: Each cell contains means with standard deviations in parentheses. Asterisks denote significant differences across age groups: \*p < .05; \*\* p < .01; \*\*\*p < .001.

Table 4. Cross-sectional Age Variation in the Six RPWB Dimensions: NSFH III Respondents

RPWB Scales <sup>a</sup>	Age Groups				
	39-48 years (n=752)	49-58 years (n=1,580)	59-68 years (n=879)	69-78 years (n=582)	79+ years (n=376)
Autonomy ***	4.036 (.539)	3.991 (.530)	3.958 (.483)	3.899 (.433)	3.842 (.414)
Environmental Mastery	3.853 (.633)	3.873 (.587)	3.884 (.512)	3.852 (.476)	3.833 (.438)
Personal Growth ***	4.116 (.507)	4.075 (.509)	3.937 (.509)	3.735 (.481)	3.663 (.486)
Positive Relations ***	3.856 (.658)	3.889 (.612)	3.878 (.552)	3.775 (.532)	3.703 (.502)
Purpose in Life ***	3.820 (.604)	3.830 (.561)	3.701 (.548)	3.441 (.601)	3.220 (.579)
Self-Acceptance ***	3.855 (.661)	3.865 (.627)	3.813 (.587)	3.740 (.588)	3.743 (.519)

<sup>a</sup> Response choices range from 1 to 5. Items were averaged to create each scale.

Note: Each cell contains means with standard deviations in parentheses. Asterisks denote significant differences across age groups: \*p < .05; \*\* p < .01; \*\*\*p < .001.

Table 5. Cross-sectional Age Variation in the Six RPWB Dimensions: A Summary

RPWB Scale	Study				
	MIDUS	WLS 1993-94	WLS 2004-05	NSFH 1992	NSFH 2002
Autonomy	0.014 <sup>a</sup> (0.000)	0.003 (0.000)	NA	0.003 (0.006)	0.012 (0.000)
Environmental Mastery	0.014 (0.000)	0.012 (0.000)	NA	0.011 (0.000)	-0.000 (0.519)
Personal Growth	0.007 (0.000)	0.006 (0.000)	NA	0.021 (0.000)	0.085 (0.000)
Positive Relations	0.010 (0.000)	0.004 (0.000)	NA	0.003 (0.005)	0.009 (0.000)
Purpose in Life	0.020 (0.000)	0.007 (0.000)	NA	0.041 (0.000)	0.105 (0.000)
Self-Acceptance	0.003 (0.016)	0.006 (0.000)	NA	-0.000 (0.667)	0.006 (0.000)
N	3,324	10,914	NA	4169	4169

<sup>a</sup> Main entries are adjusted R<sup>2</sup> in the regression of the subscale on dummy variables for age categories, and parenthetic entries are levels of statistical significance.

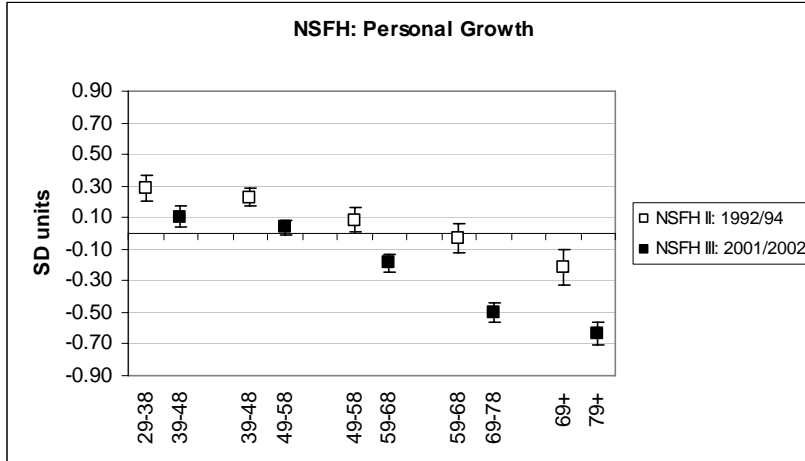
Table 6. Longitudinal Intracohort Variation in the Six RPWB Dimensions: WLS Graduates (N=5,217)

RPWB subscales (comprising both positively and negatively worded items) <sup>a</sup>	Mean (S.D.)		95% C.I. for the difference in means	Percentage of variance between 1993 and 2004 (based on adjusted R <sup>2</sup> )
	1993	2004-05		
Autonomy	4.64 (0.92)	4.60*** (0.88)	-0.06 – -0.02	0.04%
Env. mastery	4.92 (0.84)	5.02*** (0.76)	0.07 – 0.11	0.32%
Personal growth	5.18 (0.77)	5.05*** (0.75)	-0.15 – -0.11	0.66%
Positive relations	4.77 (0.98)	4.79 (0.97)	-0.01 – 0.04	0.00%
Purpose in life	4.91 (0.84)	4.83*** (0.84)	-0.10 – -0.06	0.21%
Self-acceptance	5.01 (0.85)	4.90*** (0.82)	-0.13 – -0.09	0.42%

<sup>a</sup> Items were averaged to create a subscale. Positively worded were reverse coded such that higher scores indicate a greater amount of a quality (range 1-6).

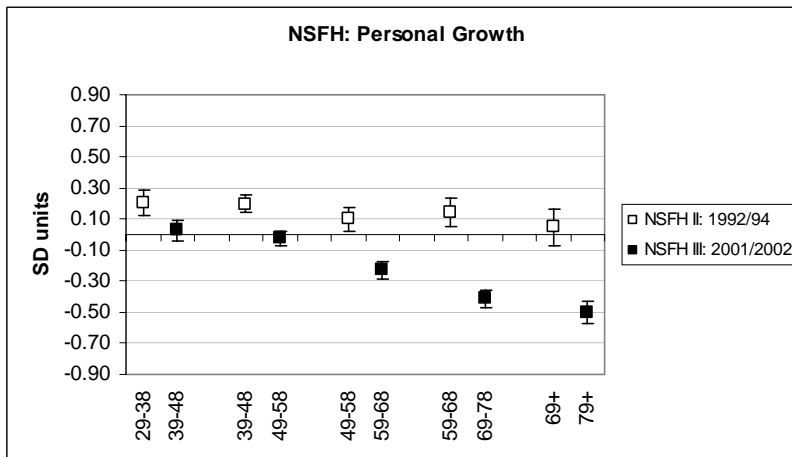
Note: Asterisks denote significant differences in means: \*\*\*p < .001 (two-tailed t-tests).

Figure 1a. Personal Growth (all items): NSFH, 1992/94-2001/02



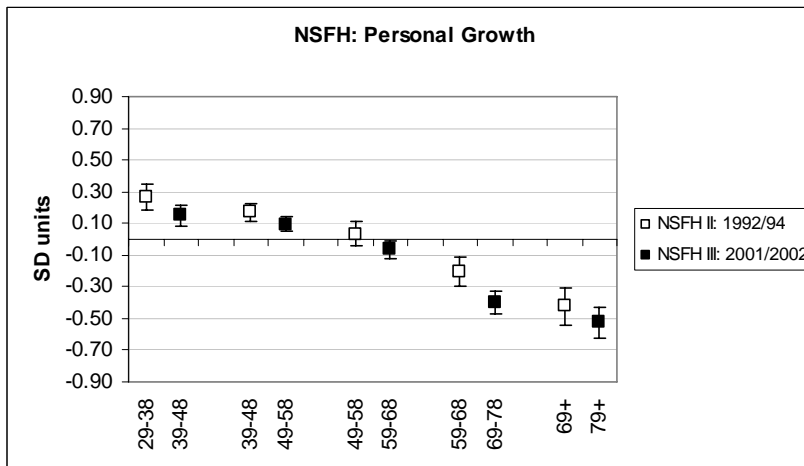
Note: Standardized means  $\pm$  2 standardized SE

Figure 1b. Personal Growth (positively worded items only): NSFH, 1992/94-2001/02



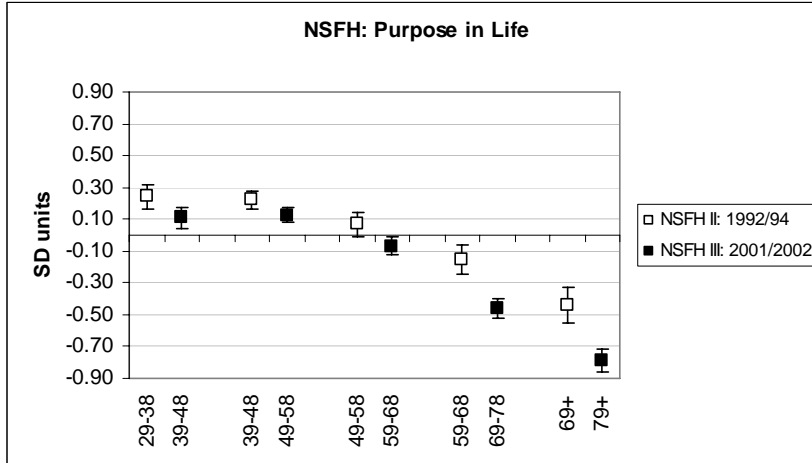
Note: Standardized means  $\pm$  2 standardized SE

Figure 1c. Personal Growth (negatively worded items only): NSFH, 1992/94-2001/02



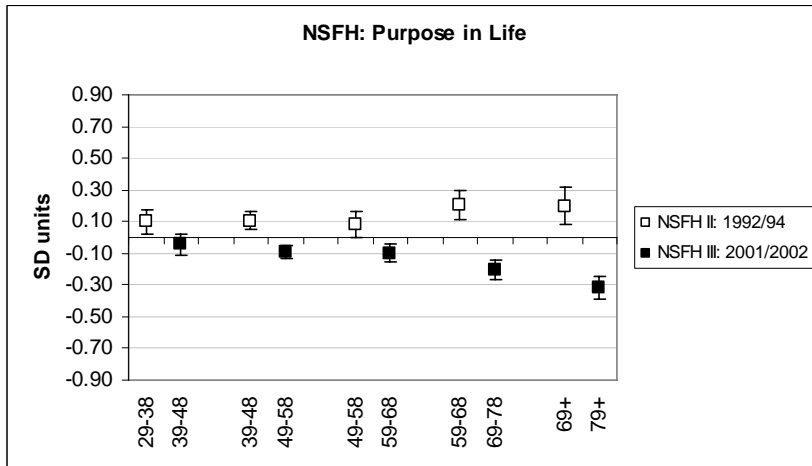
Note: Standardized means  $\pm$  2 standardized SE

Figure 2a. Purpose in Life (all items): NSFH, 1992/94-2001/02



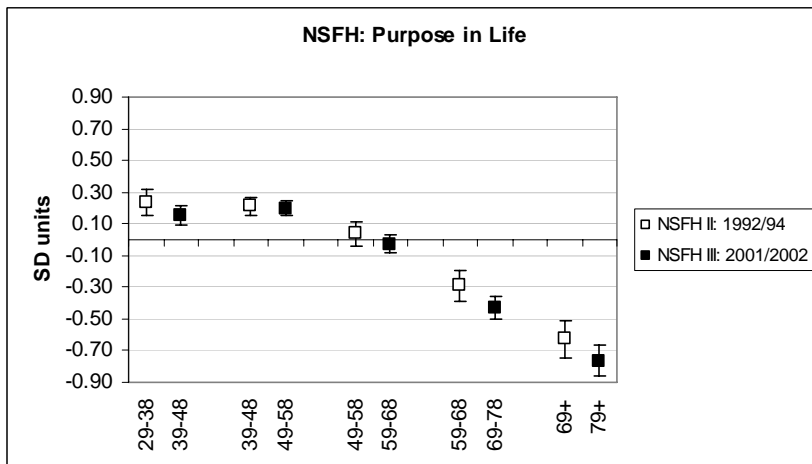
Note: Standardized means  $\pm$  2 standardized SE

Figure 2b. Purpose in Life (positively worded items only): NSFH, 1992/94-2001/02



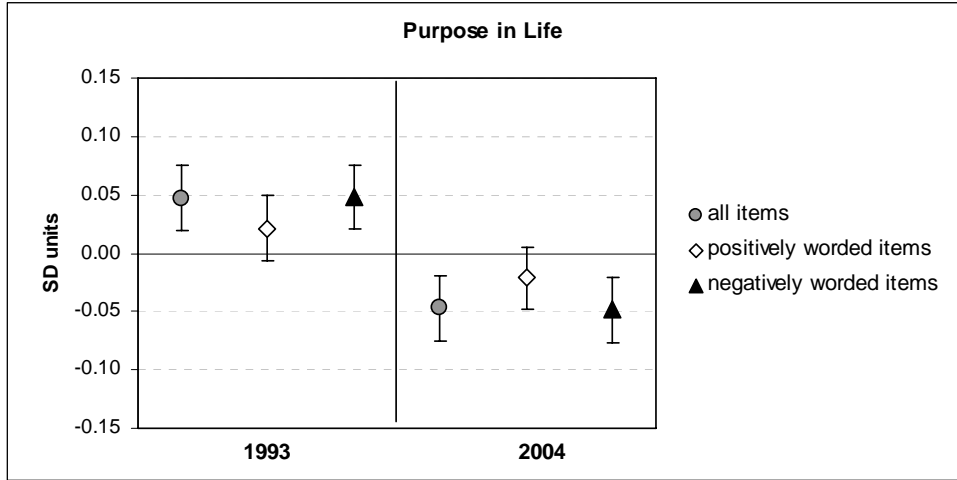
Note: Standardized means  $\pm$  2 standardized SE

Figure 2c. Purpose in Life (negatively worded items only): NSFH, 1992/94-2001/02



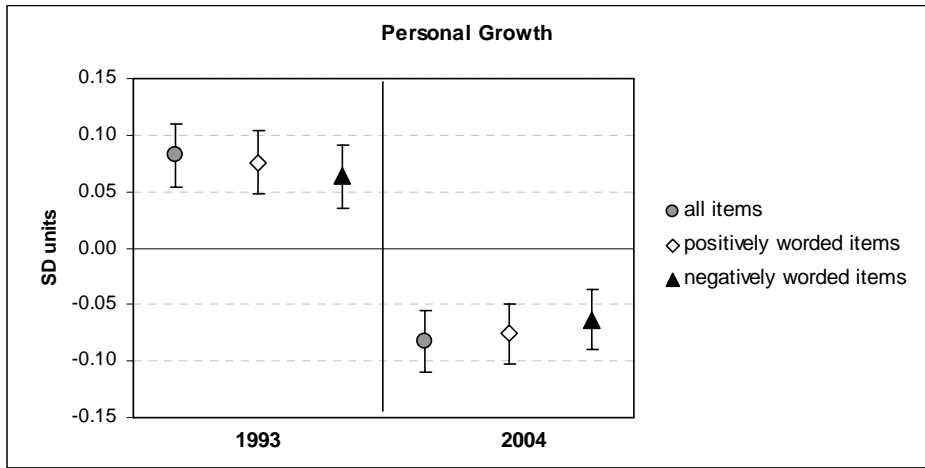
Note: Standardized means  $\pm$  2 standardized SE

Figure 3. Purpose in Life: WLS, 1992/93-2003/05



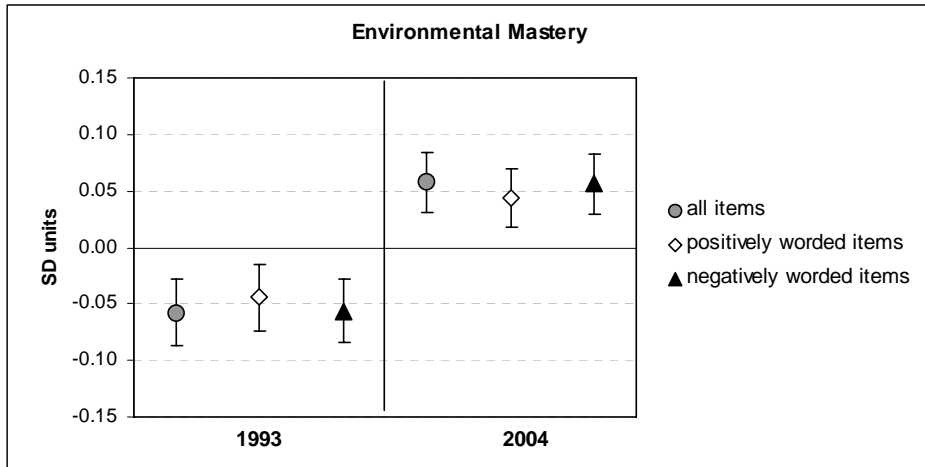
Note: Standardized means  $\pm$  2 standardized SE

Figure 4. Personal Growth: WLS, 1992/93-2003/05



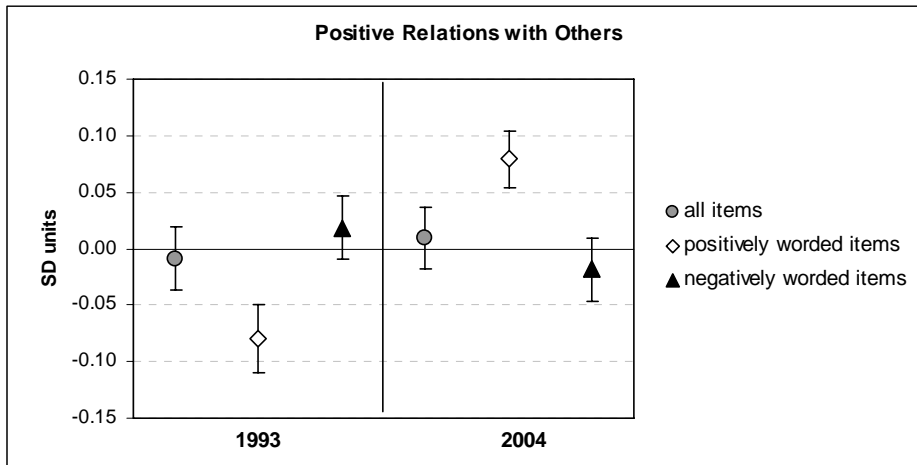
Note: Standardized means  $\pm$  2 standardized SE

Figure 5. Environmental Mastery: WLS, 1992/93-2003/05



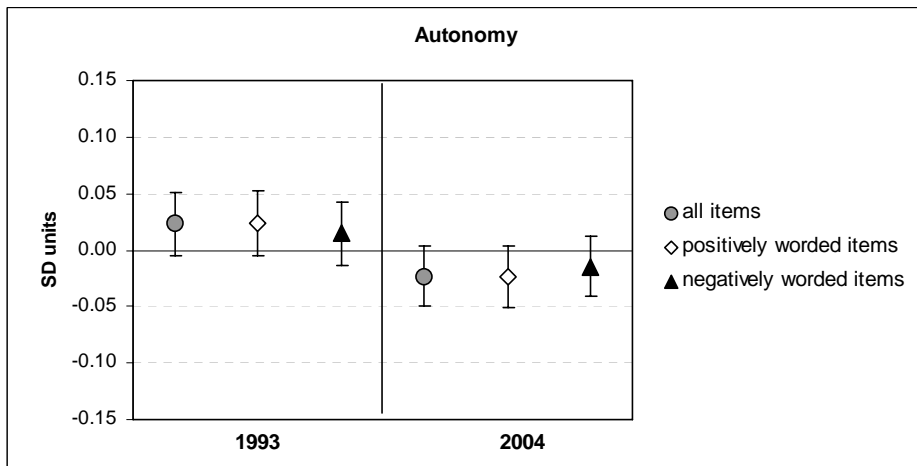
Note: Standardized means  $\pm$  2 standardized SE

Figure 6. Positive Relations with Others: WLS, 1992/93-2003/05



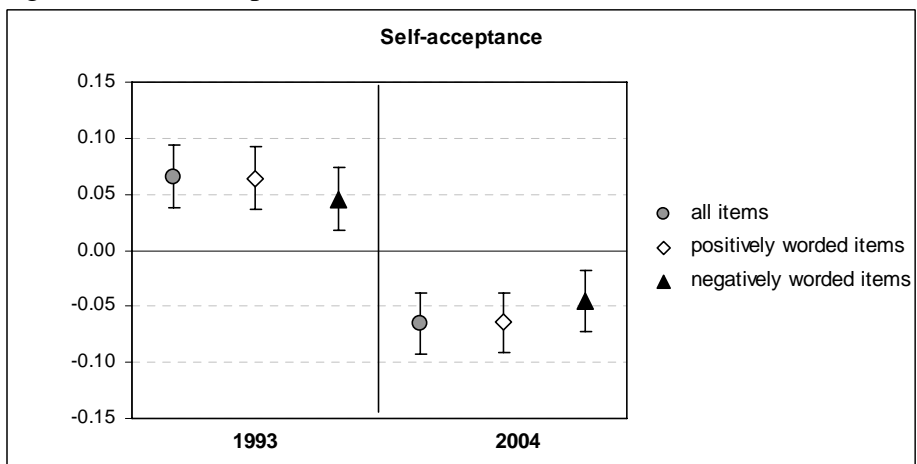
Note: Standardized means  $\pm$  2 standardized SE

Figure 7. Autonomy: WLS, 1992/93-2003/05



Note: Standardized means  $\pm$  2 standardized SE

Figure 8. Self-Acceptance: WLS, 1992/93-2003/05



Note: Standardized means  $\pm$  2 standardized SE

APPENDIX A. The Psychological Well-being Items in the WLS Surveys.

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<b>PWB Items</b>	
<i>1992-1993</i>	<i>2003-2005</i>
<i>I. Autonomy</i>	
<p><b>I have confidence in my opinions even if they are contrary to the general consensus.</b> <b>I'm not afraid to voice my opinions, even in opposition to opinions of most people.</b> <b>*It's difficult for me to voice my opinions on controversial matters.</b> My decisions are not usually influenced by what everyone else is doing.  * I worry about what others think of me.  * I often change my mind about decisions if friends or family disagree. Being happy with myself is more important than having others approve of me.</p>	<p><b>I have confidence in my opinions even if they are contrary to the general consensus.</b> <b>I'm not afraid to voice my opinions, even in opposition to opinions of most people.</b> <b>*It's difficult for me to voice my opinions on controversial matters.</b>  * I tend to be influenced by people with strong opinions. I judge myself by what I think is important, not by what others think is important.</p>
<i>II. Environmental Mastery</i>	
<p><b>I'm good at managing the many responsibilities of my daily life.</b> <b>*I have difficulty arranging my life in a way that is satisfying to me.</b> <b>I've been able to create a lifestyle for myself that is much to my liking.</b> I'm good at juggling my time so that I can fit everything that needs to be done.  * I often feel overwhelmed by my responsibilities.  * I don't fit very well with the people and community around me. I do a good job of taking care of my personal finances and affairs.</p>	<p><b>I'm good at managing the many responsibilities of my daily life.</b> <b>*I have difficulty arranging my life in a way that is satisfying to me.</b> <b>I've been able to create a lifestyle for myself that is much to my liking.</b>  In general, I feel I am in charge of the situation in which I live.  *The demands of everyday life often get me down.</p>

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*III. Personal Growth*

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**I have the sense that I have developed a lot as a person over time.**

**\*When I think about it, I haven't really improved much as a person over the years. It's important to have new experiences that challenge how I think about myself and the world.**

\*I'm not interested in activities that will expand my horizons.

\*I don't want to try new ways of doing things—my life is fine the way it is.

\*I don't enjoy being in new situations that require me to change my old familiar ways of doing things.

\*There's truth to the saying you can't teach an old dog new tricks.

**I have the sense that I have developed a lot as a person over time.**

**\*When I think about it, I haven't really improved much as a person over the years. It's important to have new experiences that challenge how I think about myself and the world.**

For me, life has been a continuous process of learning, changing, and growing.

\*I gave up trying to make big improvements or changes in my life a long time ago.

---

*IV. Positive Relations*

---

**\*I often feel lonely because I have few close friends with whom to share my concerns.**

**\*It seems to me that most other people have more friends than I do.**

**People would describe me as a giving person, willing to share my time with others.**

\*I don't have many people who want to listen when I need to talk.

I enjoy personal and mutual conversations with family and friends.

Most people see me as loving and affectionate.

I know I can trust my friends, and they know they can trust me.

**\*I often feel lonely because I have few close friends with whom to share my concerns.**

**\*It seems to me that most other people have more friends than I do.**

**People would describe me as a giving person, willing to share my time with others.**

\*Maintaining close relationships has been difficult and frustrating for me.

\*I have not experienced many warm and trusting relationships with others.

I enjoy personal and mutual conversations with family members and friends.



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*V. Purpose in Life*

---

**I'm an active person in carrying out the plans I set for myself.**

**\*I don't have a good sense of what it is I'm trying to accomplish in life.**

**\*I sometimes feel as if I've done all there is to do in life.**

**\*I used to set goals for myself, but that now seems like a waste of time.**

I tend to focus on the present because the future nearly always brings me problems.

I enjoy making plans for the future and working to make them a reality.

\*My daily activities often seem trivial and unimportant to me.

**I'm an active person in carrying out the plans I set for myself.**

**\*I don't have a good sense of what it is I'm trying to accomplish in life.**

**\*I sometimes feel as if I've done all there is to do in life.**

**\*I used to set goals for myself, but that now seems like a waste of time.**

\*I live one day at a time and don't really think about the future.

Some people wander aimlessly through life, but I am not one of them.

---

*VI. Self-Acceptance*

---

**In general, I feel confident and positive about myself.**

**When I compare myself to friends and acquaintances, it makes me feel good about who I am.**

**\*In many ways, I feel disappointed about my achievements in life.**

\*I feel like many of the people I know have gotten more out of life than I have.

\*My attitude about myself is probably not as positive as most people feel about themselves.

I made some mistakes in the past, but I feel that all in all everything has worked out for the best.

The past had its ups and downs, but in general I wouldn't want to change it.

**In general, I feel confident and positive about myself.**

**When I compare myself to friends and acquaintances, it makes me feel good about who I am.**

**\*In many ways, I feel disappointed about my achievements in life.**

When I look at the story of my life, I am pleased with how things have turned out.

I like most aspects of my personality.

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\* Negatively worded (reverse scored) item.

APPENDIX B. The Psychological Well-being Items in the NSFH and MIDUS Surveys.

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**PWB Items**

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*I. Autonomy*

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1. \* I tend to be influenced by people with strong opinions.
  2. I have confidence in my opinions, even if they are different from the way most people think.
  3. I judge myself by what I think is important, not by the values of what others think is important.
- 

*II. Environmental Mastery*

---

1. \* The demands of everyday life often get me down.
  2. In general, I feel I'm in charge of the situation in which I live.
  3. I'm quite good at managing the many responsibilities of my daily life.
- 

*III. Personal Growth*

---

1. It's important to have new experiences that challenge how I think about myself and the world.
  2. \* I gave up trying to make big improvements or changes in my life a long time ago.
  3. For me, life has been a continuous process of learning, changing, and growth.
- 

*IV. Positive Relations*

---

1. \* Maintaining close relationships has been difficult and frustrating for me.
  2. \* I have not experienced many warm and trusting relationships with others.
  3. People would describe me as a giving person, willing to share my time with others.
- 

*V. Purpose in Life*

---

1. \* I live life one day at a time and don't really think about the future.
  2. \* I sometimes feel as if I've done all there is to do in life.
  3. Some people wander aimlessly through life, but I'm not one of them.
- 

*VI. Self-Acceptance*

---

1. I like most parts of my personality
  2. When I look at the story of my life, I'm pleased about how things have turned out.
  3. \* In many ways, I feel disappointed about my achievements in life.
- 

\* Negatively worded (reverse scored) item.