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Examining mechanisms of personality maturation: The impact of life satisfaction on the development of Big Five personality traits

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SOEP – The German Socio-Economic Panel Study at DIW Berlin

455-2012

Examining Mechanisms of Personality Maturation: The Impact of Life Satisfaction on the Development of the Big Five Personality Traits

Jule Specht, Boris Egloff, Stefan C. Schmukle

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Abstract

Individuals are expected to mature with increasing age, but it is not yet fully understood which factors contribute to this maturation process. Using data of a representative sample of Germans ($N = 14,718$) who gave information about their Big Five personality traits twice over a period of 4 years, we identified satisfaction with life, which was reported yearly, as an important variable for explaining mechanisms and interindividual differences in personality maturation. Dual latent change models suggest that more satisfied (compared to less satisfied) individuals experience more positive changes in Emotional Stability, Agreeableness, and Conscientiousness and that positive changes in life satisfaction are associated with positive changes in personality. Furthermore, maturation processes were examined for individuals who faced a social role transition, namely, marriage, birth of a child, or entering the job market. Again, differential effects highlight the importance of life satisfaction for personality maturation.

Keywords: personality development, Big Five personality traits, life satisfaction, personality maturation, longitudinal latent modeling

Examining Mechanisms of Personality Maturation:

The Impact of Life Satisfaction on the Development of the Big Five Personality Traits

Personality, although temporarily stable, is also subject to change. Consequently, several studies have analyzed personality development over the lifespan (Roberts & DelVecchio, 2000; Roberts, Walton, & Viechtbauer, 2006) and have mainly concluded that individuals mature with increasing age (e.g., Lüdtke, Roberts, Trautwein, & Nagy, 2011; Soto, John, Gosling, & Potter, 2011), which enables people to fulfill social roles successfully (Roberts, Wood, & Caspi, 2008). However, thus far, it is not fully understood why individuals differ in personality maturation. Here, we will contribute to this important question by analyzing the concurrent and longitudinal relation between life satisfaction and personality changes in general and in the context of three normative social role transitions, namely, marriage, birth of a child, and entering the job market.

Mechanisms of Personality Changes

The Big Five personality traits (Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) reflect interindividual differences in thoughts, feelings, and behavior (Roberts et al., 2008) and show several intraindividual changes over the life course (Lucas & Donnellan, 2011; Specht, Egloff, & Schmukle, 2011b). The social investment principle (Roberts et al., 2008) assumes that personality development in adulthood is driven mainly by investing in changing social roles that are accompanied by several expectations (Lodi-Smith & Roberts, 2007; Roberts, Wood, & Smith, 2005). As hypothesized in the sociogenomic model of personality (Roberts & Jackson, 2008), changes in environmental characteristics that accompany these changing social roles first produce changes in personality states in the forms of momentary thoughts, feelings, and behaviors. Then, due to the maintaining

influence of the changed social role on personality states, the latter manifests in changes in deep-seated personality traits.

This mechanism of personality change leaves room for several interindividual differences in personality maturation. For example, it might be that individuals invest more or less in their new social roles (Lodi-Smith & Roberts, 2007) or that individuals need more or less time until their deep-seated personality traits adapt to the changes in the environment.

The Mature Personality

Increases in Emotional Stability, Conscientiousness, and Agreeableness are often labeled maturation because higher values on those traits are expected to facilitate the mastering of social roles (Roberts & Mroczek, 2008). For example, the parenting styles of agreeable and conscientious mothers tend to be beneficial for the children (Smith, Spinrad, Eisenberg, Gaertner, Popp, & Maxon, 2007); the same applies to agreeable and extraverted fathers (Belsky, 1996). In the context of social relationships, Agreeableness enhances the ability to maintain relationships (Jensen-Campbell & Graziano, 2001; Park & Antonioni, 2007), is particularly appreciated in romantic relationships (Buss & Barnes, 1986), and is, along with Emotional Stability, associated with better evaluations of marriages (Donnellan, Conger, & Bryant, 2004). Regarding working life, Conscientiousness has been shown to be a particularly strong predictor of several aspects of career success (Judge, Higgins, Thoresen, & Barrick, 1999).

However, the findings of a recent study (Specht et al., 2011b) suggest that individuals do not necessarily mature when faced with normative social roles. For example, it was found that individuals became less extraverted, open, and, most notably, less agreeable, after getting married. There were also no maturational changes after giving birth to a child but rather a decrease in Conscientiousness following this event. By contrast, individuals matured strongly

after taking their first job in that their Conscientiousness increased. In sum, these findings show that not all individuals (and in some cases, not even most individuals) mature after experiencing changes in social roles even though this would be beneficial for mastering the new role demands.

Life Satisfaction and Personality Development

To explain interindividual differences in personality maturation, we used a subjective measure that we assumed would offer important information regarding mechanisms in personality development: life satisfaction. General satisfaction with life is a subjective measure suitable for providing information about the fit of an individual to his or her normative roles in that life satisfaction should increase with enhanced fit to the environment (van Aken, Denissen, Branje, Dubas, & Goossens, 2006; for earlier arguments on this issue, see Havighurst, 1961, and Lawton & Nahemow, 1973). Although relatively stable (Eid & Diener, 2004), life satisfaction is nevertheless sensitive to changes in the environment including (a) major life experiences such as marriage (Lucas, Clark, Georgellis, & Diener, 2003), death of a spouse (Lucas, 2007; Specht, Egloff, & Schmukle, 2011a), unemployment (Luhmann & Eid, 2009), and the birth of a child (Margolis & Myrskylä, 2011; see also Luhmann, Hofmann, Eid, & Lucas, in press, for an extensive overview), and (b) minor events in everyday life such as daily hassles (Chamberlain & Zika, 1992), changes in income (Luhmann, Schimmack, & Eid, 2011), and other momentary situational factors (Fujita & Diener, 2005).

Van Aken et al. (2006) examined the relation between life satisfaction and personality changes in a Dutch sample of middle-aged adults from 288 two-parent families with two adolescents. Results suggested that “In line with Social Investment Theory, successful overall adaptation to the normative social roles of mid-life, as captured through a general index of life satisfaction, was related to personality maturation” (van Aken et al., 2006, p. 509).

Unfortunately, these findings cannot be generalized easily because of the highly specific sample, and moreover, the impact of changes in life satisfaction could not be investigated because life satisfaction was measured only once.

In the same year, Scollon and Diener investigated the impact of work and relationship satisfaction on changes in Emotional Stability and Extraversion in a heterogeneous sample of 1,130 Australians. Because the longitudinal design of the study included five measurement points for life satisfaction, they were able to provide information about the effect of changes in life satisfaction on changes in Emotional Stability and Extraversion. In sum, Scollon and Diener (2006) found that Emotional Stability and Extraversion both increased with increasing work and relationship satisfaction.

In the present study, we extended those findings by combining the advantages of both studies: As done in the study by van Aken et al. (2006), we obtained information about personality changes on all of the Big Five personality traits, and simultaneously used, like Scollon and Diener (2006), data from a representative longitudinal study that enabled us to investigate the impact of changes in life satisfaction on changes in personality. Furthermore, we analyzed these effects in individuals who currently faced a major social role transition.

Aims of This Study

Our hypotheses can be summarized as follows: Higher life satisfaction should be a beneficial precondition for adapting to new social roles and should therefore lead to increases in Emotional Stability, Agreeableness, and Conscientiousness (Aken et al., 2006). Furthermore, increases in life satisfaction should be associated with increases in Emotional Stability, Agreeableness, and Conscientiousness (cf. personality maturation principle, Roberts et al., 2008, and social investment principle, Roberts et al., 2005) as well as increases in Extraversion

(Scollon & Diener, 2006). Furthermore, more satisfied individuals facing a new social role, namely, due to marriage, birth of a child, or entering the job market, should mature more compared to less satisfied individuals facing the same role transition.

Method

Participants

The data used in this study were provided by the German Socio-Economic Panel (SOEP v27), which obtains longitudinal information on a large and representative sample of private households in Germany (Wagner, Frick, & Schupp, 2007). All individuals from the chosen households aged 16 years and older were asked yearly to answer questions about their living conditions and were included in the analyses if they had no more than one missing item on each of the Big Five personality traits. As a consequence of this criterion, for each year of measurement, more than 98% of the selected sample completed each item on the Big Five questionnaires, and more than 95% responded to all of the satisfaction with life items in this time period. Due to decreasing sample sizes in the oldest old ($Ns < 40$ per age), analyses were restricted to participants who were 82 years of age or younger. The final sample consisted of 14,718 individuals (7,719 women) with a mean age of 47.21 years ($SD = 16.28$ years) at the first time of measurement.

Individuals in our final sample (continuers) differed slightly from those who took part only in the first measurement of personality (drop-outs): Continuers were older ($d = 0.12, p < .001$) and more likely to be female, $\chi^2(1, N = 14.718) = 6.20, p = .01$. Referring to their personality characteristics, continuers did not differ in their Emotional Stability ($d = .01, p = 0.44$), but were more conscientious ($d = 0.11, p < .001$), open ($d = 0.09, p < .001$), agreeable ($d = 0.07, p < .001$), and extraverted ($d = 0.05, p = .001$). Continuers were also more satisfied with

their lives in general ($d = 0.13, p < .001$). In sum, the common attrition effects were of modest size.

Measures

Big Five. Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness were measured two times, first in 2005 and then again in 2009 using a 15-item version of the Big Five Inventory (John, Donahue, & Kentle, 1991; see Gerlitz & Schupp, 2005, for the short scale and evidence of its validity, and Donnellan and Lucas, 2008, for its strong correlation with the full version). Participants indicated their agreement on a scale ranging from 1 (*does not apply at all*) to 7 (*applies perfectly*). Table 1 shows the means and standard deviations of these variables. As can be seen, Emotional Stability increased slightly in general, whereas the other four traits decreased slightly in this time period in general. Please see Specht et al. (2011b) and Lucas and Donnellan (2011) for a thorough discussion of this general effect. The short and heterogeneous scales showed the expected moderate internal consistencies ($.50 \leq \alpha \leq .66$) and acceptable retest reliabilities across 6 weeks (each $r > .75$; Lang, 2005).

Satisfaction with life. One item (“How satisfied are you with your life, all things considered?”) was used to measure satisfaction with life in general for each year from 2005 to 2009 on a scale ranging from 0 (*not satisfied at all*) to 10 (*perfectly satisfied*). The descriptive statistics for this variable can be found in Table 1 as well. Again, there was a slight decrease in the whole sample for this time period in general.

Social role transitions. To allow for additional examinations in relevant subgroups, individuals who reported getting married, having a baby, or taking their first job in the time between the two personality assessments (2006 to 2009) were analyzed separately as well. There

were 664 individuals who got married (346 women), 993 who had a baby (534 women), and 456 who entered the job market (241 women).

Statistical Model

To analyze changes in personality, we used a latent factor approach to account for the moderate reliability coefficients and to distinguish structural relations from random measurement error (Bollen, 1989), which necessitates testing for strict factorial invariance first (Bollen & Curran, 2006). The model was estimated with Mplus Version 6.12 (Muthén & Muthén, 1998-2011) and accounted for the potential dependencies within households by using the household number as a cluster variable (Muthén & Satorra, 1995). Estimation of model fit was based on the full information maximum likelihood estimator (FIML), which enabled the determination of the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Adequate model fit is indicated by a CFI above .90 and an RMSEA as well as an SRMR below .08 (Hu & Bentler, 1998; Marsh, Hau, & Grayson, 2005).

Strict measurement invariance was tested by a model containing two correlated latent factors for each of the five personality factors with three indicators each in 2005 and in 2009. Factor loadings, measurement intercepts, and error variances were constrained to be equal across time points (Meredith, 1993). Residuals of corresponding manifest items were allowed to correlate across time to account for effects not due to the factors of interest (Bollen & Curran, 2006; Marsh & Hau, 1996).

Changes in personality and life satisfaction were analyzed separately for each of the five traits using dual latent change models, in which we controlled for the baseline levels as depicted in Figure 1. The personality factor was included as a latent factor in 2005 (P 2005) and 2009 (P

2009), each with three indicators. A latent intercept factor (P level) reflected the baseline level of this personality trait in 2005, and a latent slope factor (P change) reflected mean-level changes from 2005 to 2009 after controlling for differences in this trait in 2005. Satisfaction with life was modeled with a latent growth approach: The latent intercept factor (LS level) reflected the baseline level of life satisfaction in 2005, and the latent growth factor (LS change) reflected linear changes in life satisfaction between 2005 and 2009 after controlling for differences in LS level. Sex and age (both mean-centered), as well as age² and age³, were included in the models as predictors of the intercepts (P level and LS level) and slopes (P change and LS change) to control for them as classic demographic variables. To allow for comparisons, effects were standardized with respect to both the intercept of the personality factor and the intercept of life satisfaction.

Apart from these main models, which analyzed the relation between life satisfaction and personality changes in general, we created three additional models for each of the five traits. Thus, we applied the model in Figure 1 to three subgroups of individuals who faced a major social role transition in this time period: individuals who (a) got married, (b) had a baby, or (c) got their first job. Again, effects were standardized with respect to both the intercept of the personality factor and the intercept of life satisfaction.

Results

The models testing whether the requirements of a latent factor approach were met each fit well (each CFI > .95, RMSEA ≤ .06, SRMR < .04), indicating that strict measurement invariance was satisfied.

The dual latent change models analyzing changes in the Big Five personality traits and life satisfaction fit the data as well (each CFI > .95, RMSEA < .05, and SRMR ≤ .04). A detailed list of the results can be found in Table 2.

There were highly significant correlations between the baseline level of life satisfaction and the baseline levels of each of the five personality traits. Individuals who were more satisfied with their lives were concurrently more emotionally stable ($r = .413$), extraverted ($r = .223$), open to experience ($r = .204$), agreeable ($r = .169$), and conscientious ($r = .193$, each $p < .001$).

The baseline level of life satisfaction predicted negative changes in life satisfaction for the years that followed ($-.197 \geq \beta \geq -.205$, $p < .001$). This means that individuals who were one standard deviation above the average on life satisfaction in 2005 experienced a drop in life satisfaction in the years afterwards of about 0.20 standard deviations, and those who were one standard deviation below the mean showed an increase of about 0.20 standard deviations, compared to individuals with average life satisfaction in 2005. Likewise, the baseline level of each personality trait predicted a negative slope for this trait for the years that followed ($-.255 \geq \beta \geq -.320$, $p < .001$; please see Rogosa, Brandt, & Zimowski, 1982, for these common negative effects between the baseline level and change).

The main interests in the current study are the relations between life satisfaction, personality, and changes in these constructs. Life satisfaction at the baseline level predicted a positive change in Emotional Stability ($\beta = .046$, $p = .001$), Agreeableness ($\beta = .045$, $p < .001$), and Conscientiousness ($\beta = .033$, $p = .008$). This means that individuals who were more satisfied in 2005 experienced more positive changes in Emotional Stability, Agreeableness, and Conscientiousness in the years afterwards compared to individuals who were less satisfied. However, there were no significant effects of life satisfaction on changes in Extraversion and Openness to Experience.

Interestingly, the effects of personality at the baseline level on changes in life satisfaction were consistently smaller and never significant at the $p < .01$ level. However, there was an effect

of Agreeableness in 2005 on the slope of life satisfaction with a p -value of .01. Individuals who were more agreeable at the baseline level (compared to less agreeable individuals) experienced a stronger increase in life satisfaction in the years afterwards ($\beta = .034$). However, because of the large number of analyses, single effects with $p \geq .01$ should be interpreted with caution.

Furthermore, there was a positive relation between increases in life satisfaction and positive changes in all of the five personality traits. Individuals who increased more strongly in life satisfaction also experienced a comparatively positive change in Emotional Stability ($r = .510$), Extraversion ($r = .265$), Openness to Experience ($r = .166$), Agreeableness ($r = .166$), and Conscientiousness ($r = .180$, each $p < .001$).

When adapting the model in Figure 1 to a subgroup of individuals who experienced a major social role transition, the models again fit the data: each $CFI \geq .899$, $RMSEA \leq .057$, $SRMR \leq .045$. Results were largely comparable to the results reported above for the main models (although results did not always reach significance due to the reduced samples sizes) but with one notable difference: In these subgroups, life satisfaction in 2005 did not universally predict positive changes in Emotional Stability, Agreeableness, and Conscientiousness. For individuals who got married or who had a baby, there was instead only one, but particularly strong, effect of life satisfaction in 2005 on positive changes in Agreeableness ($\beta = .258$, $p = .008$, for individuals who got married; $\beta = .196$, $p = .001$, for individuals who had a baby). This means that individuals who were more satisfied in 2005 became considerably more agreeable during the time of the social role transition than did individuals who were less satisfied. There were no significant effects at the $p < .01$ level of life satisfaction on personality changes for individuals who entered the job market, but individuals tended to become less emotionally stable

in this subgroup when they were more satisfied in 2005 ($\beta = -.235, p = .04$). Again, this last effect needs to be interpreted with caution because it reached significance only at $p \geq .01$.

Discussion

In this study, we were able to comprehensively link personality, life satisfaction, and changes in these constructs in general and when individuals were faced with a normative social role transition. This was done by using data from a very large and representative sample that provided information on all of the Big Five personality traits twice and on life satisfaction yearly across a period of 4 years. The sample characteristics and the latent modeling approach enabled highly generalizable results that fill a gap in the exploration of differential personality development. In sum, individuals who are more satisfied with their lives are more capable of personality maturation in the years that follow. When faced with a social role transition, this effect is particularly pronounced in the traits that aid the mastering of these new roles.

Life Satisfaction Facilitates Personality Maturation

As hypothesized, individuals who are more satisfied with their lives experience more positive changes in Emotional Stability, Agreeableness, and Conscientiousness in the years that follow compared to less satisfied individuals. Increases in these traits are commonly labeled personality maturation (Roberts et al., 2008) because higher values on these traits facilitate the mastering of normative social roles. Thus, life satisfaction seems to be a beneficial precondition for this maturation process, maybe because individuals have more resources for adapting to environmental expectations when they are more satisfied compared to when they are less satisfied. By contrast, there were barely any effects the other way around (i.e., for personality predicting changes in life satisfaction).

To strictly test whether life satisfaction drives personality change more than personality drives satisfaction change (see Table 2), we used the Wald-Test implemented in Mplus. The standardized effects of satisfaction on changes in Emotional Stability, Agreeableness, and Conscientiousness were not significantly stronger than the corresponding effects of Emotional Stability, Agreeableness, and Conscientiousness on changes in satisfaction (all $p > .05$). Thus, although life satisfaction seems to have more influence on change processes compared to personality given the stronger and significant effects, direct comparisons of both effects suggest that these small differences might as well be attributed to chance.

Furthermore, individuals whose life satisfaction increases more strongly also concurrently experience more positive changes in personality (see also Boyce, Wood, & Powdthavee, in press). This was true for all of the Big Five personality traits and suggests that positive developmental processes interact with each other. For example, it might be the case that individuals become more satisfied because of an enhanced fit to their environment (van Aken et al., 2006), which then not only affects their current personality states but also motivates them to change their deep-seated personality (Roberts & Jackson, 2008). Comparably, individuals who undergo personality maturation might experience social rewards due to their appropriate behavior (Roberts et al., 2005) and therefore become more satisfied. Both directions of influence are reasonable and because the impacts of both directions of influence do not significantly differ in strength, personality and life satisfaction both seem to be important.

Personality Maturation and Social Role Transitions

In a recent study by Specht et al. (2011b), it was found that individuals in general do not show personality maturation due to getting married or having a baby, although (a) this would be beneficial for mastering the new role demands (Belsky, 1996; Buss & Barnes, 1986; Donnellan

et al., 2004; Jensen-Campbell & Graziano, 2001; Park & Antonioni, 2007; Smith et al., 2007) and (b) this would be expected from the social investment and personality maturation principles (Roberts et al., 2008).

In this study, we identified a possible explanation for this: Although individuals do not mature in general when faced with these two role transitions, there are systematic differences between individuals who did and did not mature, respectively. Individuals who were more satisfied with their lives experienced considerably more positive changes in Agreeableness in this time period compared to less satisfied individuals. This might suggest that experiencing these events is not sufficient for personality maturation but that individuals who are more satisfied—maybe also as an indicator of increased commitment and ability to invest in the new social roles—clearly show personality maturation. Interestingly, this was true only for Agreeableness, which plays a particularly central role in the expectations that come along with these two specific new roles (for an overview, see Jensen-Campbell, Knack, & Gomez, 2010).

However, results were different for individuals who entered the job market. Due to this event, individuals increase strongly in their Conscientiousness (Specht et al., 2011b) and there seem to be no additional differential maturation processes for individuals high or low in life satisfaction. Maybe because role demands are more transparent in the working context, it is normative to mature on Conscientiousness, the key trait that predicts job success (Judge et al., 1999). This normative maturation effect might be the cause of why there are no additional beneficial effects for individuals high in life satisfaction.

Limitations and Future Directions

This study has several methodological strengths such as the large sample size, the longitudinal design, and the sample's representativeness, which all allow for meaningful

generalizations to the German and other comparable populations. However, there are also some limitations that should be addressed in future research.

First, life satisfaction is a comprehensive measure, and more detailed measures would further contribute to the understanding of personality development (see, for example, Hill, Turiano, Mroczek, & Roberts, in press). Second, we focused on personality maturation in terms of the Big Five in this study. Because maturation is an extensive construct, it cannot be captured entirely by this conceptualization. It would be interesting to investigate other aspects of maturation and their relations to life satisfaction as well (see, for example, King & Hicks, 2007; Loevinger, 1966; Staudinger & Kunzmann, 2005).

Third, due to the nonexperimental nature of the study, it is not clear whether changes in life satisfaction lead to changes in personality or vice versa. A third occasion of measurement of the Big Five personality traits could enrich our understanding of cause and effect and moreover would allow for the modeling of nonlinear trajectories in personality change (Rogosa, 1995). Thus, we encourage the SOEP to continue to measure the Big Five personality traits to allow for these analyses in future years.

Conclusion

In this paper, we were able to show that changes in personality indicating maturation (i.e., increases in Emotional Stability, Agreeableness, and Conscientiousness) can be predicted by general satisfaction with life. Individuals with higher life satisfaction seem to be more capable of adapting to their environments, which leads to personality maturation. Additionally, increases in life satisfaction come along with more positive changes in all of the Big Five personality traits. These findings have meaningful implications for differential maturation processes. For example, individuals who get married or have a baby do not automatically show personality maturation

(Specht et al., 2011b). However, compared to less satisfied individuals, more satisfied individuals experienced considerably more positive changes in Agreeableness, a trait that is especially beneficial in these contexts. In sum, systematically linking personality, life satisfaction, and changes in these constructs provides important insights into the mechanisms of personality maturation.

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Table 1

Descriptive Statistics for the Manifest Variables: Means (Standard Deviations)

Variables	Year of measurement				
	2005	2006	2007	2008	2009
Big Five					
Emotional Stability	4.04 (1.22)	-	-	-	4.16 (1.21)
Extraversion	4.85 (1.12)	-	-	-	4.75 (1.12)
Openness	4.54 (1.20)	-	-	-	4.37 (1.20)
Agreeableness	5.47 (0.97)	-	-	-	5.33 (0.98)
Conscientiousness	5.93 (0.92)	-	-	-	5.84 (0.93)
Life satisfaction	7.03 (1.77)	6.93 (1.74)	6.94 (1.73)	6.98 (1.72)	6.87 (1.76)

Note. $N = 14,718$. Scale range for the Big Five: 1 (*does not apply at all*) to 7 (*applies perfectly*). Scale range for life satisfaction: 0 (*not satisfied at all*) to 10 (*perfectly satisfied*).

Table 2

The Relation between Personality, Life Satisfaction, and Changes in These: Results for the Whole Sample

Model results	Models									
	Emotional Stability		Extraversion		Openness		Agreeableness		Conscientiousness	
Model fit										
CFI	.952		.984		.960		.981		.964	
RMSEA	.044		.026		.040		.026		.036	
SRMR	.034		.024		.035		.025		.040	
Model parameters										
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
P change on P level	-0.315**	-0.315**	-0.255**	-0.255**	-0.284**	-0.284**	-0.311**	-0.311**	-0.320**	-0.320**
P change on LS level	0.031*	.046*	0.012	.017	0.009	.014	0.023**	.045**	0.018*	.033*
LS change on LS level	-0.205**	-0.205**	-0.197**	-0.197**	-0.199**	-0.199**	-0.202**	-0.202**	-0.197**	-0.197**
LS change on P level	0.022	.015	0.000	0.000	0.020	.013	0.065 ⁺	.034 ⁺	0.002	.001
	Cov	Corr	Cov	Corr	Cov	Corr	Cov	Corr	Cov	Corr
P level with LS level	.526**	.413**	.305**	.223**	.258**	.204**	.165**	.169**	.197**	.193**
P change with LS change	.263**	.510**	.150**	.265**	.087**	.166**	.074**	.166**	.091**	.180**

Note. Results are based on the model depicted in Figure 1. All values are controlled for sex, age, age², and age³ (age and sex were centered beforehand). Effects are standardized with respect to both the intercept of the personality factor (P level) and the intercept of life satisfaction (LS level). CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; P level = personality in 2005; P change = change in personality between 2005 and 2009; LS level = life satisfaction in 2005; LS change = change in life satisfaction between 2005 and 2009; Cov = residual covariance; Corr = residual correlation.

⁺*p* < .05. **p* < .01. ***p* < .001.

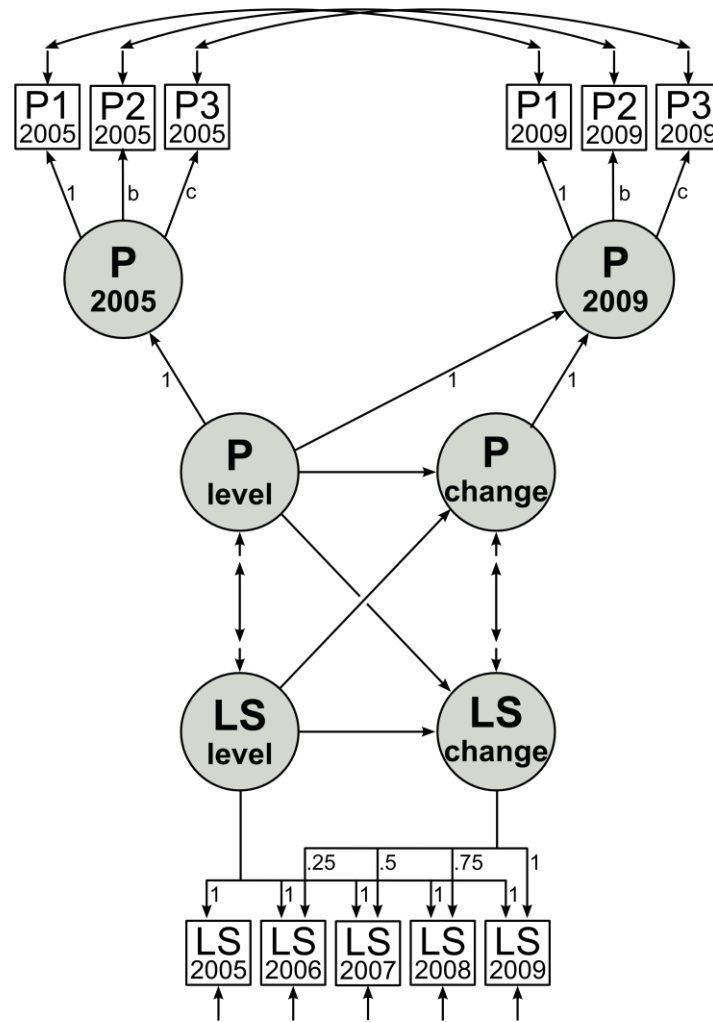


Figure 1. Latent model for analyzing changes in personality and life satisfaction. The personality factor was included as a latent factor in 2005 (P 2005) and in 2009 (P 2009) with three indicators each (P1 2005-P3 2005, and P1 2009-P3 2009, respectively). Factor loadings (b and c), measurement intercepts, and error variances were constrained to be equal across time points, and residuals of the manifest items were allowed to correlate across time. Changes in personality were modeled with a latent change approach including a latent intercept factor (P level) and a latent slope factor (P change). The trajectory of life satisfaction was modeled using a linear latent growth model including a latent intercept factor (LS level) and a latent growth factor (LS change) with five indicators (LS 2005-LS 2009). Both change variables (P change and LS change) were controlled for baseline levels (P level and LS level). To control for demographic variables, sex, age, age², and age³ were included as covariates for each of the latent variables (P level, P change, LS level, and LS change). Please note that these demographic variables are not included in the figure to enhance the facility of inspection.