

Self-esteem across adulthood: the role of resources

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Abstract It is still not well understood how and why developmental trajectories of self-esteem change, particularly in late life. We investigated the role of resources for self-esteem change across adulthood. In detail, we explored between-person differences in self-esteem levels and change in relation to resources with participants who ranged in age from 17 to 100 years. Study 1 consisted of a cross-sectional representative German sample of 12,609 participants, where we observed few age differences in mean levels of self-esteem across adulthood. Being married or in a relationship and positive subjective health were associated with higher levels of self-esteem. In addition, relations of resources of subjective health as well as neuroticism with self-esteem appeared to be smaller in late compared to young adulthood. Longitudinal studies

including young ($N = 338$) and older adults ($N = 325$) indicated both reasonably high stability regarding rank-order and mean levels of self-esteem across 4 and 8 years. Again, age-differential resources appeared to be important for higher levels of self-esteem with education being related to self-esteem in young adults and subjective health in late life. However, no resource was associated with changes in self-esteem in either young or late adulthood. Overall, findings suggest that self-esteem levels are reflective of age-specific constraints and risks.

Keywords Self-esteem · Resources · Adulthood · Old age · Cross-sectional data · Longitudinal data

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Self-esteem is defined as the general evaluation of the self. Typically, research on self-esteem change has focused on adolescence or early adulthood (e.g., Crocker 2011; Sedikides et al. 2003; Swann et al. 2007). Recently, the interest in lifespan patterns of self-esteem has increased (Orth et al. 2010; Pullmann et al. 2009; Shaw et al. 2010; Wagner et al. 2013a), but results for old age are inconsistent. Furthermore, recent studies illustrated the important role of self-esteem for the emergence of depression and other major life outcomes (Kuster et al. 2013; Orth et al. 2011; Sowislo and Orth 2012); however, further research is needed to understand conditions of self-esteem across the lifespan. From a lifespan perspective, it has been argued that mastery of specific demands and challenges of life phases across adulthood depends on the availability of age-specific resources (Baltes 1987). For example, investment in educational resources in early adulthood may serve to prepare individuals for the future, whereas subjective health resources may serve to protect a sense of mastery with everyday demands in later life. In this vein, self-esteem

reflects a positive evaluation of resources of the self in dealing with age-specific demands across adulthood. In this research we address two issues: First, we examine age differences in mean levels of and change in self-esteem across the adult lifespan. Second, we investigate age-specific associations of diverse resources on self-esteem change.

Self-esteem across adulthood

Findings on self-esteem mean levels in early and middle adulthood were shown to be relatively stable but with a slight and continuous increase until late midlife (Huang 2010; Orth et al. 2011; Wagner et al. 2013b). In later adulthood, however, both cross-sectional and longitudinal studies observed lower mean levels in self-esteem after age 65 (Orth et al. 2010; Robins et al. 2002; Shaw et al. 2010), whereas other studies have suggested relative mean-level stability (Huang 2010; Pullmann et al. 2009; Wagner et al. 2013a), or even mean-level increase in old age (Marsh et al. 2010). Importantly, recent studies clarified that age differences in self-esteem are not due to cohort differences but reflect aging-related change (Orth et al. 2010, 2011).

A resource-theoretical perspective on self-esteem

Findings from two longitudinal studies (Orth et al. 2010; Shaw et al. 2010) observed that late life declines in self-esteem might be affected by such variables as education, socioeconomic status, or health. For example, higher educated individuals reported higher self-esteem, although effects slightly decreased in late life. This emphasizes a potential resource-dependency of self-esteem with both consistent and specific relevance in young, middle, and late adulthood. According to this, changes in self-esteem across adulthood depend on available resources of the self, and thus reflect an evaluation of such resources in mastering developmental tasks and aging-related challenges. More generally, we assume that resources may contribute to self-esteem in age-specific ways depending on the individual and contextual demands of young, middle, or late adulthood.

In our study, we focus on resources that are known to have age-specific effects on developmental outcomes in early adulthood (Lehnart et al. 2010; Schieman and Campbell 2001) or on successful aging (Baltes and Lang 1997; Jopp et al. 2008) such as subjective health, partner status, education, and positive personality. For example, being in a partnership and developing a positive personality, i.e., high emotional stability, conscientiousness and agreeableness, relate to higher self-esteem in young adults (Robins et al. 2001; Wagner et al. 2013b); however, such

relations may vary depending on age. Furthermore, certain resources are known to generally decrease in late life, such as subjective health that illustrated age-related declines in previous studies (Diehr et al. 2002; Gerstorf et al. 2013). Thus, associations with self-esteem may also be affected by the (in-)stability of resources.

According to our age-specific resource model, we expect more resources to be related to higher self-esteem. This is true for objective resources such as partnership status or education, and subjective resources such as personality. There are two conditions that refine this general statement. First, age-specific challenges may require investing in resources that serve developmental adaptation. For example, finding a partner (i.e., starting a family) appears to be central in young adulthood and, thus, should be related to self-esteem in this life period. Conversely, poor health may be particularly detrimental to self-evaluation in early and middle adulthood but more normatively expected, and thus considered less ego-central, for older adults. Hence, self-evaluation depends on resource investigations according to age-specific conditions. Our second refinement addresses a potential discounting of those resources that are known to decline in late life. With changing meanings of resources across adulthood, specific resources may level off or become less important for self-esteem across adulthood. Such resilience to decreasing resources (e.g., in physical health; Diehr et al. 2002; Gerstorf et al. 2013) has been shown to reflect a late life adaptation (Staudinger 2000). Thus, late life change appears to be guided by adaptation processes that help to protect and maintain positive functioning irrespective of losses in several domains (Baltes and Baltes 1990). Consequently, we expect that, as an adaptation (or resilience) to changing gain-loss dynamics, the association between decreasing resources and self-esteem should become weaker or level off with age.

The present studies

We investigated two issues regarding self-esteem across adulthood: First, are there age differences in mean levels and change trajectories in self-esteem across adulthood? Second, are resources age-specifically related to self-esteem mean levels and change? We used three studies—one lifespan sample, where we looked at cross-sectional age differences in self-esteem, and two longitudinal samples with participants in either young or late adulthood, where we were able to look at mean-level changes in self-esteem—to address the age-specific challenges of self-esteem and to explore two sets of hypotheses: First, we expected that in all three studies individuals would show a positive view on the self from young until late life. In addition, we expected between-person differences in mean

Table 1 Descriptive statistics for variables of studies 1, 2, and 3

	Study 1		Study 2		Study 3	
	Lifespan sample		Young adulthood		Late adulthood	
	<i>N</i> = 12,609		<i>N</i> = 330		<i>N</i> = 325	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-esteem	5.57	1.27	3.91	0.66	4.10	0.56
Age ^a	54.39	15.58	24.07	3.85	70.88	4.23
Gender (1 = male)	0.47	0.50	0.45	0.50	0.46	0.48
Education (in years)	12.28	2.71	11.61	1.54	10.07	1.77
Partnership (1 = yes)	0.81	0.39	0.80	0.40	0.67	0.48
Parental status (1 = yes)	0.72	0.45	0.38	0.49	0.87	0.34
Subjective health	3.25	0.94	/		3.80	0.63
Personality						
Neuroticism	3.84	1.21	2.64	0.63	2.25	0.55
Extraversion	4.73	1.13	3.40	0.56	3.25	0.50
Openness	4.61	1.10	/		3.31	0.47
Agreeableness	5.34	0.98	3.66	0.46	4.03	0.40
Conscientiousness	5.87	0.92	3.71	0.55	4.09	0.48

^a Age range: study 1 from 25 to 100, study 2 from 17 to 30, study 3 from 64 to 84. Descriptive statistics of study 1 are based on the assessment of 2010, where self-esteem was included in the study; for studies 2 and 3 the respective first assessment is presented. Slash: Subjective health was not assessed in study 2 and openness to experiences not at the first assessment of study 2

levels (all studies) and change trajectories (studies 2 and 3). Second, in all studies we expected resources to be positively related to self-esteem in general. However, a few resources, such as education or partnership status, were expected to show age-specific effects. In addition, we hypothesized resources that typically decrease in old age (e.g., health, cf., Diehr et al. 2002; Gerstorf et al. 2013) to remain important but not affect self-esteem as strongly in late adulthood compared to young adults.

Study 1

Study 1—a representative sample of 12,609 participants—focused on cross-sectional interindividual differences in self-esteem across the entire adult lifespan. In addition, it was used to predict these interindividual differences by means and change estimates of resources across the last 5 years.

Participants

Study 1 was based on the German Socio-Economic Panel (SOEP; Wagner et al. 2007), an annual study of private

households and individuals conducted since 1984. The following sample represents a subsample that comprises all individuals with valid participation in the six waves between 2005 and 2010. At the assessment in 2010 that included self-esteem, study 1 consisted of $N = 12,609$ adults between the ages of 25 and 100 ($M = 54.4$, $SD = 15.6$; 47 % male). Their average years of education were 12.3 years ($SD = 2.7$). A major percentage of participants were married or had a romantic partner (81 %) and were parents (72 %; cf., Table 1).

Selectivity analyses with individuals who participated in 2005 only and those with continuous participation showed that continuers were on average older, Cohens d effect size = 0.07, more likely female, $d = 0.04$, had a higher education, $d = 0.14$, lived in a partnership, $d = 0.15$, and had biological children, $d = 0.14$. In addition, continuers reported on average better subjective health, $d = 0.06$, and were more extraverted, $d = 0.05$, open to experience, $d = 0.08$, and conscientious, $d = 0.10$. There were no differences in neuroticism or agreeableness between the two groups. Considering effect sizes, selectivity analyses illustrated only marginal group differences that may be indicative of only small selectivity effects.

Measures

Self-esteem

Self-esteem was assessed in 2010 with an adapted German single-item measure (“I have a positive attitude about myself”). A 7-point response scale ranging from 1 (*not at all*) to 7 (*very much*) was utilized.

Self-rated health

Self-rated health was assessed annually with an established single item (“How would you describe your current health status?”) using a 5-point response scale ranging from 1 (*very good*) to 5 (*bad*). For further analyses, the item was reverse-coded such that higher values indicated better health. This variable is a time-varying covariate (TVC).

Personality

Personality characteristics were operationalized with a 15-item short version of the Big Five inventory (Lang et al. 2011) and assessed twice, in 2005 and 2009. A 7-point response scale ranging from 1 (*not at all*) to 7 (*very much*) was utilized. Internal consistency of the subscales (α) was between 0.50 and 0.83. Personality is a TVC.

Participants reported gender (1 = male), age, years of education, partnership (1 = with partner), and parental (1 = with children) status, among other demographic

characteristics. Demographics are included as time-invariant covariate (TIC). Table 1 summarizes descriptive information on all variables of study 1.

Statistical procedure

In a first step, multiple regression models considered age effects and resource variables that were assessed once as TICs. Analyses were computed with PASW 18. In a second step, self-esteem was predicted by latent intercept and slope parameters of time-varying resource variables using latent-change models (LCMs; Bollen and Curran 2006) of self-rated health and Big Five personality. Repeated measures of health and personality were included as manifest variables and served as indicators for two latent factors: Fixing all loadings to unity, the latent intercept reflects the mean level at the first assessment. The latent slope reflects the amount of linear change that occurred between assessments. The variance component of the intercept and slope represents the amount of between-person differences in mean levels at the first assessment and change trajectories across time, respectively. Based on available data, the intercept and slope for personality were based on two waves, whereas for health, it was based on six waves. For both characteristics, we established linear change models and included intercept and slope of health and personality into one statistical model to predict self-esteem in 2010. Thus, self-esteem was modeled as a consequence of development in resource variables. Finally, a multigroup model was utilized to test for age differences in associations of resources and self-esteem across four consecutive age groups (ages 20–35, 36–50, 51–65, and 66 years of age and older).

LCMs were fit to the data using Mplus Version 6.1 (Muthén and Muthén 1998–2010). Model fit evaluation was based on the full-information maximum likelihood estimator (FIML) and used conventional criteria, that is, χ^2 test statistics, the root mean square error of approximation (RMSEA), as well as the comparative fit index (CFI). RMSEAs below 0.08 and 0.05 and CFIs greater than 0.90 and 0.95 are suggested as guidelines for acceptable and excellent fit to the data, respectively (Marsh et al. 2005). Model comparison was based on the χ^2 -difference-test.

Results and discussion

Self-esteem mean levels were found to be high, that is, well above the midpoint of the scale ($M = 5.57$, $SD = 1.27$). A multiple regression analysis in wave 2010 predicting self-esteem by age indicated a small positive linear relation ($\beta = 0.04$, $p < 0.001$, $R^2 = 0.002$). Neither the quadratic nor the cubic age terms were significant. Importantly, the explained R^2 variance partition of 0.2 % illustrates the minor main effect of age on self-esteem. Thus, age accounted for little mean-level differences in self-esteem.

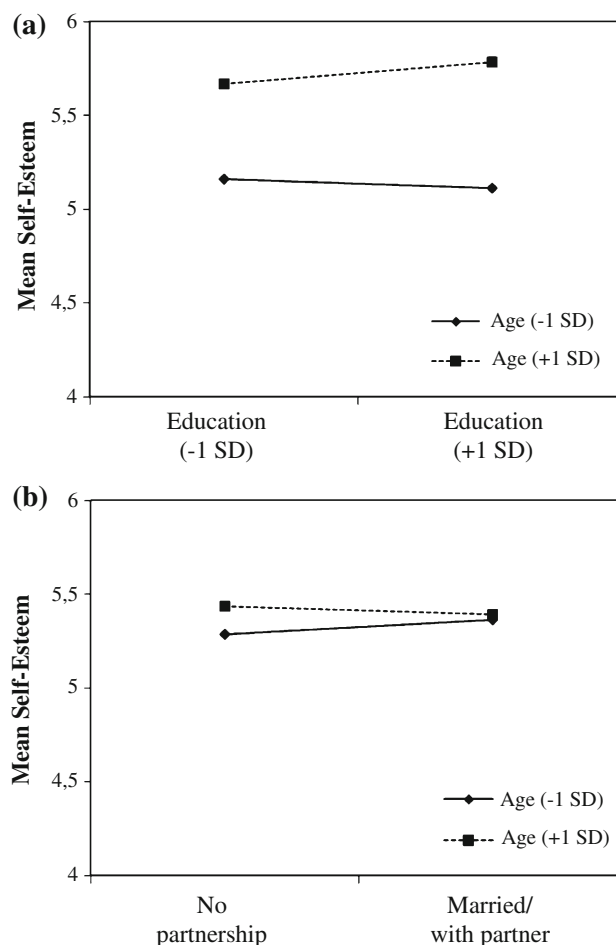


Fig. 1 Predicted mean self-esteem in 2010 by **a** years of education and age and **b** partnership status and age

Individuals of all ages evaluated their self in a positive way.

Resource characteristics

A multiple regression analysis predicted between-person differences in self-esteem by education, partnership and parental status, gender, age, and all possible age interaction effects. Older participants ($\beta = 0.09$, $p < 0.001$), male participants ($\beta = 0.07$, $p < 0.001$), and parents ($\beta = 0.03$, $p < 0.01$) reported higher self-esteem. In addition, neither years of education ($\beta = 0.01$, $p > 0.05$) nor partnership status ($\beta = 0.01$, $p > 0.05$) exerted a main effect on self-esteem, but the effect of both resources varied substantially by age (education \times age, $\beta = 0.03$, $p < 0.01$; partnership \times age, $\beta = -0.04$, $p < 0.01$). More years of education were related to a more positive self-evaluation in late adulthood (Fig. 1a). Contrary to previous findings and our expectations, education appeared to be an important resource for self-esteem only in late life. We found lower self-esteem for singles in young adulthood (Fig. 1b).

Table 2 Prediction of mean levels in self-esteem in a german lifespan sample using longitudinal change in subjective health and personality

	<i>M</i>	<i>Var</i>	Prediction of self-esteem 2010					Constrained $\Delta\chi^2$ (<i>df</i>)
			Entire sample <i>N</i> = 12,609	Age groups				
				20–35 <i>n</i> = 2,641	36–50 <i>n</i> = 4,163	51–65 <i>n</i> = 3,557	65+ <i>n</i> = 2,248	
Subjective health (SH)								
Intercept SH	3.37	0.55	0.08**	0.17**	0.13**	0.10**	0.11**	13.56 (3)**
Linear SH	−0.02	0.01	0.13**	0.24**	0.17**	0.12**	0.07	19.37 (3)**
Personality characteristics								
Neuroticism								
Intercept	3.96	1.50	−0.28**	−0.29**	−0.28**	−0.27**	−0.22**	8.68 (3)*
Slope	−0.12	1.28	−0.17**	−0.19**	−0.18**	−0.15**	−0.13**	6.33 (3)*
Agreeableness								
Intercept	5.48	0.95	0.12**	0.10**	0.11**	0.11**	0.11**	0.47 (3)
Slope	−0.13	0.90	0.07**	0.06**	0.07**	0.07**	0.07**	2.26 (3)
Openness								
Intercept	4.52	1.45	0.06**	0.06**	0.06**	0.06**	0.07**	3.19 (3)
Slope	0.08	1.10	0.03*	0.03*	0.03*	0.04*	0.04*	5.15 (3)
Extraversion								
Intercept	4.84	1.26	0.15**	0.16**	0.16**	0.16**	0.16**	0.44 (3)
Slope	−0.11	0.98	0.09**	0.09**	0.09**	0.09**	0.09**	4.84 (3)
Conscientiousness								
Intercept	5.97	0.81	0.12**	0.12**	0.11**	0.12**	0.11**	4.53 (3)
Slope	−0.11	0.80	0.06**	0.06**	0.06**	0.07**	0.07**	3.83 (3)
<i>R</i> ²			0.20	0.26	0.23	0.20	0.17	
Model fit	χ^2	<i>df</i>	RMSEA	CFI	χ^2	<i>df</i>	RMSEA	CFI
	390.47	60	0.021	0.996	642.38	264	0.021	0.995

Note All means and variances are substantial at $p < 0.001$. * $p < 0.01$, ** $p < 0.001$

Including all time-invariant resource variables increased the explained variance to only 0.8 %.

Next, we predicted self-esteem by level and slope of subjective health and Big Five personality. The overall model indicated good model fit (Table 2). Estimates showed fairly high self-rated health in 2005, and change indicators illustrated a substantial but only small decrease in self-rated health across time. For personality, the latent-change part of the model illustrated the expected decreases in neuroticism, extraversion, agreeableness, and conscientiousness, but an increase in openness (cf. Lucas and Donnellan 2011). With respect to both subjective health and personality, there were substantial interindividual differences in all intercepts and slopes. Thus, results clearly indicate changes of resources across time and substantial interindividual differences in level and change.

Predicting self-esteem in 2010, higher self-esteem was related to higher levels and less decline in self-rated health, as well as to normative trends of less neuroticism, and higher extraversion, openness, agreeableness, and conscientiousness.

Utilizing the multigroup procedure, we tested for age-specific associations between self-esteem and resources. By comparing models with and without equality constraints across the four age groups, self-esteem in 2010 indicated higher associations with both the intercept and the slope of subjective health as well as neuroticism in younger compared to older age groups (Table 2, last column). Thus, the association between self-esteem and mean-level and change of subjective health and neuroticism, respectively, appeared to be smaller in old compared to young adulthood. The explained variance decreased from 26 % in the youngest to 17 % in the oldest age group.

Findings from Study 1 suggest that positive evaluations of subjective health and the development of a positive personality were related to higher self-esteem. Also, resources showed age-specific effects suggesting that self-evaluations might increasingly dissociate from resources known to decrease in late life such as having more health issues. Importantly, self-esteem appeared reasonably stable across the lifespan. Thus, our study supports expectations of positive self-evaluations up to old age.

While there were several measurement points of subjective health and personality characteristics, a caveat relates to the cross-sectional assessment of self-esteem. In addition, despite wide acceptance (Lang et al. 2011) some of the 3-item personality scales were fairly low in reliability; thus, a more elaborate assessment could improve the validity of findings. Studies 2 and 3 addressed these limitations and modeled longitudinal self-esteem change in young and late adulthood.

Studies 2 and 3

Studies 2 and 3 used longitudinal samples in young and late adulthood and included resource variables (e.g., Big Five) as time-varying covariates of self-esteem change.

Participants

In wave 1, Study 2 consisted of a representative German sample of 339 young adults between 17 and 30 years of age ($M = 24.07$, $SD = 3.85$; 55 % female; cf., Table 1). Participants of Study 2 were part of a three-wave longitudinal research project that took place between 1995 and 2003. For a more detailed description of the sample and procedure, see Neyer and Lehnart (2007). The three time points were 4 years apart, covering a period of 8 years.

Study 3 comprised a sample of 325 participants from the Genetic Oriented Life Span Study on Differential Development between the ages of 64 and 84 ($M = 70.88$, $SD = 4.23$; 64 % female; cf., Table 1) at the first time of data assessment. Again, for a more detailed description of the sample and procedure, see Neyer (2002). The presented analyses were based on data collected in 1999 and 2003, thus providing a 4-year time interval.

Method

Self-esteem

In both studies, general self-esteem was assessed at all time points using the 6-item Marsh and O'Neill (1984) questionnaire with a 5-point response scale ranging from 1 (*not at all*) to 5 (*completely*). Sample item is "Overall, I am pretty accepting of myself". Internal consistency was sufficient in both samples and across time (α s between 0.64 and 0.80).

Resource variables

Besides demographic information on age, sex, education, partnership, and parental status, empirical investigations included the German version of the NEO-FFI (Borkenau

and Ostendorf 1991) utilizing the same response scale as self-esteem. Internal consistency was satisfactory across subscales, time points, and samples (α s in young adulthood between 0.66 and 0.84, and in late adulthood between 0.54 and 0.81). Only study 3 was additionally complemented by an established one-item measure of subjective health ("How would you describe your health?") rated on a 5-point response scale from 1 (*very bad*) to 5 (*very good*).

Table 1 summarizes descriptive information on all variables of studies 2 and 3.

Statistical analyses

Data analyses for both studies were divided into two steps in which we, first, explored change trajectories of self-esteem across time with LCMs (Bollen and Curran 2006), and second, analyzed conditional LCMs including resources as covariates. Again, models were fit to the data using Mplus, and model fit evaluation criteria were the same as in Study 1.

We applied LCMs with multiple indicators using structural equation modeling techniques to estimate self-esteem change. Applied second-order latent growth models (Sayer and Cumsille 2001) control for measurement error at the level of indicators and, thus, have the advantage of being able to discriminate between structural relations and measurement error (Bollen and Curran 2006). Observed self-esteem indicators were used to measure time-specific latent self-esteem and to then define two latent factors of self-esteem growth: the latent intercept and the latent slope, defined as described in Study 1.

For applying LCMs, measurement invariance across time is essential to guarantee that observed change in manifest variables is real change (Bollen and Curran 2006). We insured strict factorial invariance for both age groups (see Table 4 in the Appendix). All models are thus based on a measurement model with invariant factor loadings, item intercepts, and error variances. In addition, we allowed for correlated residuals across time because they account for effects of the specific factors that are not due to the common factors of interest.

We extended the univariate latent curve models by estimating a number of conditional LCMs with resource variables as covariates. The inclusion of covariates that are invariant across time was performed by analyzing the impact of the covariate on the intercept and on the slope of self-esteem. To consider covariates that vary or change across time such as personality, we included covariates directly within the LCMs to use them as exogenous predictors, or so called time-varying covariates, of the outcome (Curran and Bauer 2011; Preacher et al. 2008). The resulting β parameters can be referred to as time-specific effects of that covariate on the outcome (Preacher et al.

2008). Constraining the β parameters to be equal leads to a substantial decrease in model fit if effects on the outcome vary across time. Thus, the covariate would illustrate time-varying effects on the outcome. Model comparison was based on the χ^2 -difference-test.

Results and discussion

Self-esteem continuity and change

Latent mean-level analyses indicated an increase in global self-esteem across the 8-year period in young adulthood ($d = 0.22, p < 0.01$) and a decrease across 4 years in late adulthood ($d = -0.13, p < 0.05$) (cf., Table 5 in the Appendix). Similar to previous studies, effect sizes were generally small (e.g., Roth et al. 2008). Interestingly, comparing latent means of young and late adulthood indicated higher self-esteem at T1 for older adults ($d = 0.37$), but this difference dissolved at T2 ($d = 0.17$).

Latent models supported the pattern of self-esteem increase in young adulthood ($0.06, p < 0.05$) and decrease in late adulthood ($-0.06, p < 0.05$). In addition, in both age groups we found substantial interindividual differences in the average self-esteem level (young adulthood: $0.29, p < 0.001$; late adulthood: $0.19, p < 0.001$) and slope (young adulthood: $0.07, p < 0.001$; late adulthood: $0.06, p < 0.01$). To illustrate the magnitude of between-person differences around the mean slope, we computed the 95 % plausible value range (PVR) as suggested by Raudenbush and Bryk (2002). In young adults, the slope parameter varied between -0.46 and 0.58 and in late adulthood, the slope parameter showed a similar variation between negative (-0.43) and positive (0.55) values, suggesting there were substantial interindividual differences in change with both tendencies of self-esteem decline and increase. The model fit of the LCMs was very good for both young, $\chi^2(22) = 18.12, RMSEA = 0.00, CFI = 1.00$, and late adulthood, $\chi^2(12) = 9.05, RMSEA = 0.00, CFI = 1.00$. We next examined whether demographic and resource factors account for such interindividual differences.

Resource variables

A first analysis included demographic information of age and gender, as well as time-invariant resources into the existing LCMs of young and late adulthood (Table 3, Model 1). The conditional LCM of young adulthood indicated substantially higher levels of self-esteem by young men, individuals with higher education, and individuals with a romantic partner. There were no relations of time-invariant resources with the slope of self-esteem. In young adulthood, resources appear to be related to self-esteem levels but not to self-esteem change.

Similar to young adults, the first conditional model of late adulthood illustrated that resources related to the initial level but not the change trajectory of self-esteem. Men, individuals with better subjective health, and younger participants reported higher levels of self-esteem. At the beginning of the study, participants varied between 64 and 84 years of age, and the older people reported lower self-esteem than the younger participants in Study 3.

The second model included time-varying resource variables. With respect to young adults, lower neuroticism and higher extraversion, openness and conscientiousness were related to higher levels of self-esteem, above and beyond normative self-esteem change (Table 3, Model 2). Associations with agreeableness varied across time with substantial positive associations only at the first assessment and no substantial associations at all later assessment points. It appeared that agreeableness was important for self-esteem at first but became less important throughout the late 20s and early 30s. Irrespective of the inclusion of personality, between-person differences in self-esteem intercept ($0.08, p < 0.01$) and slope ($0.04, p < 0.001$) remained substantial.

In late adulthood, above and beyond the normative change of self-esteem lower neuroticism, higher extraversion, and higher conscientiousness were related to higher self-esteem across time (Table 3, Model 2). There were no substantial associations with openness to experience or agreeableness. In late adulthood, personality variables reduced the variance component in the self-esteem slope ($0.02, p = 0.059$), but not the intercept ($0.03, p < 0.001$), to only marginal significance suggesting that between-person differences in self-esteem change in late adulthood are to some extent related to between-person differences in personality characteristics.

To compare effects across young and late adulthood, we used confidence intervals of unstandardized estimates following the guidelines of Cumming and Finch (2005). Comparisons suggest that, irrespective of age-specific effects, confidence bands of all but one resource showed substantial overlap. Similar to findings from Study 1, the relation between neuroticism and self-esteem was stronger in young compared to late adulthood.

In sum, mean levels in self-esteem proved fairly stable across adulthood. Effect sizes (Table 5 in the Appendix) show that mean-level differences between age groups were small in magnitude (or even absent). However, increases and decreases in self-esteem over time were observed for young and old adults. In line with our expectations, we observed age-specific contributions of resources on self-esteem: For example, higher education appeared to be an important resource for higher levels of self-esteem in young but not late adulthood.

Three additional findings may be particularly noteworthy. First, women reported lower self-esteem across all our

Table 3 Fit indices of conditional quadratic latent curve models of self-esteem in young and late adulthood with personality resources as time-varying covariates (TVCs) and standardized regression coefficients of TVCs

	Young adulthood					Late adulthood			
	Intercept	Slope	β_{SE1}	β_{SE2}	β_{SE3}	Intercept	Slope	β_{SE1}	β_{SE2}
Model 1									
Age	−0.09	0.09				−0.08**	−0.03		
Sex (1 = female)	−0.15*	0.12				−0.25***	0.11		
Time-invariant resources									
Education (1 = 10 years and more)	0.17*	−0.10				0.02	0.02		
Partnership (1 = yes)	0.14 ⁺	−0.01				−0.01	0.20		
Parent (1 = yes)	0.07	−0.14				0.08	−0.12		
Subjective health	/	/				0.25***	−0.02		
Model 2									
Neuroticism			−0.58***	−0.61***	−0.64***			−0.49***	−0.46***
Agreeableness			0.22*	0.02	−0.10			0.06	0.06
Openness to experience			/	0.13*	0.14*			0.03	0.02
Extraversion			0.22***	0.22***	0.24***			0.29***	0.27***
Conscientiousness			0.29***	0.30***	0.29***			0.39***	0.38***
Model fit	χ^2	<i>df</i>	RMSEA	CFI		χ^2	<i>df</i>	RMSEA	CFI
Model 1	72.98	57	0.03	0.99		72.19	36	0.06	0.94
Model 2	316.91	113	0.07	0.90		130.89	67	0.05	0.93

Note Study 2 on young adulthood included three measurement points, and Study 3 on late adulthood included only two measurement points. Openness to experience was not assessed at T1 in young adulthood. Nonsignificant χ^2 model comparison tests imply time-invariant effects of personality on self-esteem and are constrained to be equal across measurement points

⁺ $p \leq 0.054$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

studies. Previous findings have shown either a gender gap that continuously narrowed across adulthood (Robins et al. 2002) or stable gender differences. Our results appear to support the latter.

Second, similar to Study 1 extraversion and conscientiousness were consistently shown to be positively associated with self-evaluation in young and late adulthood. Being talkative and enthusiastic but also careful and deliberate may stabilize social relationships and, thus, self-evaluation across the lifespan. Negative relations of neuroticism with self-esteem supported previous literature on the detrimental effect of neuroticism in the context of self-evaluation (e.g., Wasyliw et al. 2010). Agreeableness illustrated no relation with self-esteem in late life. In young adulthood, agreeable individuals reported higher self-esteem only at the first assessment.

Third, in late life, the inclusion of personality reduced the between-person differences of self-esteem change trajectories to non-significance. In late life, being emotionally stable, extraverted, and conscientious appears not only to relate to mean levels of self-esteem, but it also accounts for a substantial part of between-person differences in self-esteem change. Thus, in general, a positive personality may

be partly regarded as a resource for positive self-evaluation and this may be particularly true in late life.

General discussion

The current research addressed self-esteem mean levels and change across adulthood. In particular, we aimed to examine age-specific resource variables for self-esteem level and change patterns. First, we illustrated that, on average, self-esteem was relatively stable across adulthood with substantial between-person differences. Second, resources showed age-consistent and age-specific covariations with self-esteem across the lifespan.

Relative mean-level consistency of self-esteem across adulthood

Studies that investigate self-esteem change in late adulthood are still rare. In a representative German sample, we observed stable positive self-esteem mean levels across adulthood up to 100 years of age. Our findings are consistent with previous research (i.e., Huang 2010; Orth et al.

2010; Roth et al. 2008, Wagner et al. 2013a). Our longitudinal results support the notion that mean levels of self-esteem are relatively stable across time periods of 8 and 4 years. Although young adults increased and old adults decreased in self-esteem, effect sizes were generally small and mean levels rather consistent across the two groups. Moreover, there were large interindividual differences—thus, self-esteem decline and increase—in both age groups.

Our longitudinal findings showed that the direction and amount of change differed within age groups. Research on the aging self supports the idea that active self-regulative abilities work throughout adulthood. In later life, however, structural characteristics, social roles, and expectations are generally less clear. Up to very old age, people seem to actively shape either their (perception of their) self or their environment to maintain a good person–environment fit (Roberts and Robins 2004). Thus, it is important to further explore conditions of self-esteem change across adulthood.

Age-specific resources and self-esteem (change)

Our findings point to age-consistent and age-specific associations between resources and self-esteem. For example, some resources are less strongly associated with self-esteem in late life. This underscores the resilience of self-esteem in later adulthood irrespective of an increasingly negative gain–loss ratio. Feeling in good physical shape may be positively associated with self-esteem across the entire adult lifespan; however, health conditions are known to inevitably decrease with age. To gradually dissociate one’s self-evaluation from a decreasing resource might be an adaptive process by which one can stabilize a positive feeling about the self (Brandtstädter 2007; Brandtstädter and Greve 1994).

With respect to neuroticism, we observed that high neuroticism in later life appeared to relate to self-esteem to a lesser extent. It may be the case that a de-differentiation is taking place such that emotional instability separates from a more general evaluation of the self in later adulthood. Thus, negative aspects of neuroticism may be less likely to affect the evaluation of the self. Further research needs to support such patterns.

In sum, our empirical results are consistent with assumptions of an age-specific resource model of self-esteem change across adulthood. However, there are also age-consistent resources that boost self-esteem constantly across adulthood until late in life. For example, extraversion appears to be an important correlate of self-esteem throughout, possibly illustrating the pivotal role of social embeddedness irrespective of age. Also, conscientiousness is increasingly regarded as essential resource, specifically for late life (Shanahan et al. in press). Thus, resource availability appears to play an important role throughout

adulthood. In addition, we empirically supported the idea that resource (in-)stability is related to self-esteem across adulthood.

Limitations and research perspectives

Despite the strengths of a longitudinal data set, a large representative sample, and often multiple-item measures that allowed latent variable approaches, we need to consider a number of caveats. First, different assessment methods of self-esteem and differential compositions of predictive variables hamper the interpretability of the results. However, we found relatively consistent patterns across empirical studies pointing toward cross-age mean-level consistency of self-esteem. Second, our analyses rely on self-rated health measures, where more objective indicators or a medical opinion would be preferred. However, because of the often less strong decrease in subjective (versus objective) health, most likely our results would be even stronger when using objective measures. Third, despite the longitudinal designs, it is not possible to infer causality. It cannot be ruled out whether higher self-esteem drives or is driven by the perception of higher resources or whether there are possible third variable-effects. Still, based on earlier research (Baltes and Lang 1997), we put forward the important role of resources for positive aging and emphasize further research to disentangle conditions and antecedents (versus outcomes) of self-esteem across the lifespan.

In conclusion, self-esteem appears to be generally positive and fairly stable across adulthood. At the same time, between-person differences are substantial across adulthood, illustrating the possibility for increases and decreases in self-esteem alike. In extending previous findings, our results reveal that resources matter for self-evaluation. More years of education, reporting better health, and a positive personality profile constitute important conditions in all life phases, but also suggest age-specific patterns. To stabilize self-esteem across adulthood, selected resources such as subjective health may gradually dissociate or become less important for the evaluation of the self. Based on such findings of age-consistent and age-specific resources of self-esteem development across adulthood, future research needs to explore the precise relation between age-specific adaptation processes and self-esteem change.

Appendix

See Tables 4 and 5.

Table 4 Fit indices for measurement invariance test of self-esteem in young and late adulthood (studies 2 and 3)

		Young adulthood				Late adulthood			
		<i>N</i> = 330				<i>N</i> = 325			
		χ^2	<i>df</i>	RMSEA	CFI	χ^2	<i>df</i>	RMSEA	CFI
M1	Unconstrained model	14.01	14	0.002	1.000	7.66	5	0.040	0.995
M2	Weak invariance	15.97	18	0.000	1.000	11.73	8	0.038	0.993
M3	Strong invariance	20.00	22	0.000	1.000	14.71	10	0.038	0.991
M4	Strict invariance	60.45	28	0.058	0.968	16.83	13	0.030	0.992
M5	Factor variances invariant across time	24.29	24	0.006	1.000	16.90	14	0.025	0.994

χ^2 Chi square, *df* degrees of freedom, *RMSEA* root mean square error of approximation, *CFI* comparative fit index. Models allow for correlated residuals

Table 5 Latent mean differences and correlations of self-esteem change in young adulthood (three waves) and late adulthood (two waves)

Self-esteem	<i>M</i>			<i>SD_p</i>	Mean-level change (<i>d</i>)			Stability (<i>r</i>)		
	T ₁	T ₂	T ₃		T ₁₂	T ₂₃	T ₁₃	T ₁₂	T ₂₃	T ₁₃
Young adulthood	3.91	3.95	4.03	0.58	0.08	0.14*	0.22*	0.54	0.49	0.64
Late adulthood	4.10	4.04	/	0.46	-0.13*	/	/	0.83	/	/

Note *d* = (mean of T₂ – mean of T₁)/*SD_p*. *SD_p* = pooled standard deviation estimated within the latent self-esteem model. / = Late adulthood sample consisted of only two waves. All correlations are statistically significant at *p* < 0.001, * *p* < 0.05

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