

Age Differences in Instability, Contingency, and Level of Self-Esteem Across the Life Span

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## Abstract

We investigated age differences in instability, contingency, and level of self-esteem from age 13 to 72 years, using data from 1,386 individuals who participated in a diary study over 25 days. Instability and contingency of self-esteem decreased from adolescence to old age, whereas level of self-esteem increased. Big Five personality traits predicted the level, but not the slope, of the trajectories of self-esteem characteristics. Age differences in self-esteem characteristics did not merely reflect age differences in instability and level of positive and negative affect. Finally, self-esteem characteristics showed a stable pattern of interrelations across the life span. Overall, the findings suggest that people's self-esteem tends to become better adjusted—i.e., more stable, less contingent, and higher—across the life course.

*Keywords:* self-esteem, instability and contingency of self-esteem, age differences, life span, Big Five personality traits

### Age Differences in Instability, Contingency, and Level of Self-Esteem Across the Life Span

Cross-sectional and longitudinal studies indicate that self-esteem shows age-related changes from adolescence to old age (e.g., McMullin & Cairney, 2004; Orth, Robins, & Widaman, in press; Orth, Trzesniewski, & Robins, 2010; Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002; Shaw, Liang, & Krause, 2010). So far, this growing body of research has focused on developmental changes in the level of self-esteem, but has neglected to investigate whether developmental changes occur with regard to other characteristics of self-esteem. Some researchers in personality and social psychology have noted that an exclusive focus on the level of self-esteem may provide an incomplete picture of the functions of self-esteem in psychological adjustment and behavior, and have advocated considering, besides level of self-esteem, the instability and contingency of self-esteem (e.g., Crocker, Luhtanen, Cooper, & Bouvrette, 2003; Crocker & Wolfe, 2001; Kernis, 2003, 2005; Kernis & Goldman, 2006). In contrast to the development of self-esteem level, however, we know almost nothing about age differences in self-esteem instability and contingency. The goal of the present research is to fill this gap.

#### **Instability and Contingency of Self-Esteem**

Self-esteem instability has been defined as the degree to which self-esteem shows temporal fluctuations across relatively short periods such as hours or days (e.g., Kernis, 2003, 2005).<sup>1</sup> A person's self-esteem may be unstable for at least two reasons. First, the person may experience a larger number of, or more extreme, positive and negative events in daily life compared to people with more stable self-esteem; thus, situational factors may influence the degree to which self-esteem is unstable. Second, self-esteem instability may reflect individual

differences in the vulnerability of self-esteem; that is, the self-esteem of some people may be more strongly influenced by potentially self-relevant events than that of others (Kernis, 2005).

The concept of self-esteem contingency is related to self-esteem instability (and, in fact, is a concept for an individual difference variable that may cause self-esteem instability, as described above). Self-esteem contingency has been defined as the degree to which self-esteem fluctuates in response to self-relevant events (e.g., Crocker & Wolfe, 2001; Crocker & Park, 2004). Whereas some people experience boosts and drops in their self-esteem even when they receive minor positive and negative social feedback, other people's self-esteem may fluctuate only when major self-relevant events occur. It has also been suggested that individuals differ in the domains on which their self-esteem is contingent (that is, people may differ in their beliefs about what type of person they must be or what they must do to be a worthy person). Domains that have been examined include, e.g., academic competence, appearance, family support, virtue, others' approval (Crocker et al., 2003), relationships (Knee, Canevello, Bush, & Cook, 2008), and friendships (Cambron, Acitelli, & Steinberg, 2010).

Extant research shows that instability and contingency of self-esteem—although related to self-esteem level—are constructs that are distinct from level of self-esteem. In a recent meta-analysis, level and instability of self-esteem were negatively correlated at  $-.31$  (Okada, 2010). Correlations of similar size have been found between self-esteem level and various measures of self-esteem contingencies (e.g., Cambron et al., 2010; Crocker et al., 2003; Knee et al., 2008). Furthermore, the utility of the concepts of self-esteem instability and contingency is supported by the fact that both variables predict behavior (e.g., aggression: Webster, Kirkpatrick, Nezelek, Smith, & Paddock, 2007; verbal defensiveness: Kernis, Lakey, & Heppner, 2008; supportiveness: Park & Crocker, 2005) and psychological adjustment (e.g., depression: Butler,

Hokanson, & Flynn, 1994; Cambron et al., 2010; Franck & De Raedt, 2007; Kernis, Grannemann, & Mathis, 1991; anger: Kernis, Grannemann, & Barclay, 1989) over and above the effect of self-esteem level or by interacting with self-esteem level.

### **Changes in Instability and Contingency of Self-Esteem Across the Life Span**

There is almost no research available that provides empirical data on age differences in instability and contingency of self-esteem. As an exception, Savin-Williams and Demo (1984) examined self-esteem instability in a sample of adolescents and found that self-esteem became more stable from age 12 to 15 years. We are not aware of any study that has examined age differences in self-esteem contingency. Given the dearth of research on age differences in instability and contingency of self-esteem, we turn to the literature on related constructs.

Research on other aspects of the self (e.g., self-compassion, self-acceptance, self-concept clarity) and research on general affective variability and reactivity suggests that self-esteem instability and contingency may show systematic changes across the life span.

Self-compassion, a construct that is positively related to resilience (Leary, Tate, Adams, Allen, & Hancock, 2007) and negatively related to ego reactivity (Neff & Vonk, 2009), increases with age (Neff & Vonk, 2009). Similarly, in a study with young, middle-aged, and old adults, Ryff (1991) found that age was related to increased self-acceptance. These findings suggest that, with increasing age, self-perceived mistakes and weaknesses have less impact on self-esteem. Moreover, Crocker and Wolfe (2001; see also Crocker & Park, 2004) hypothesized that people, as they age, gradually shift from external contingencies of self-esteem, such as others' approval, to more internal contingencies such as virtue—a change that would make people's self-esteem less susceptible to successes, failures, and social feedback in daily life and would therefore lead to a decline in self-esteem instability. Finally, age is positively related to self-concept clarity

(Lodi-Smith & Roberts, 2010). Self-concept clarity is defined as the degree to which self-beliefs are clearly and confidently defined, internally consistent, and temporally stable (Campbell, 1990; Campbell et al., 1996), and is negatively related to self-esteem instability (e.g., Nezlek & Plesko, 2001; Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000). In sum, the literature on self-related constructs suggests that self-esteem may become more stable and less contingent as people age.

Similarly, research on emotion regulation suggests that self-esteem instability and contingency decreases over the life course. For example, older people use more adaptive strategies in the selection and modification of situations such as avoidance of, and withdrawal from, negative interpersonal situations (Coats & Blanchard-Fields, 2008) and preference for daily routines (Bouisson & Swendsen, 2003). As a result, their everyday life is less varied (Almeida & McDonald, 1998)—a fact that should strengthen self-esteem stability. Also, older people use more adaptive strategies with regard to attention, appraisal, and response to events. For example, older people show an attentional bias away from emotionally negative information toward positive information (Labouvie-Vief, 2003; Mather & Carstensen, 2003), are better able to transform a conflict into a life lesson (Diehl, Coyle, & Labouvie-Vief, 1996, see also John & Gross, 2004), and appraise stressors as less severe (Almeida & Horn, 2004). Overall, the empirical evidence supports the hypothesis that affective variability and reactivity decreases as people age (e.g., Birditt, Fingerman, & Almeida, 2005; Neupert, Almeida, & Charles, 2007; Röcke, Li, & Smith, 2009; but see Sliwinski, Almeida, Smyth & Stawski, 2009). These findings suggest that self-esteem instability and contingency may similarly decrease over the life course.

Finally, the literature on personality development suggests that self-esteem instability and contingency decreases over the life span. Overall, personality changes across the life span tend to

reflect movement toward higher levels of maturity (Roberts, Wood, & Caspi, 2008). For example, agreeableness increases across the life span (Allemand, Zimprich, & Hendriks, 2008; Lucas & Donnellan, 2009; Roberts, Walton, & Viechtbauer, 2006; Terracciano et al., 2005); conscientiousness increases across the life span (Allemand et al., 2008; Lucas & Donnellan, 2009; Roberts et al., 2006) or increases from young adulthood to midlife and then decreases during old age (Terracciano et al., 2005); and neuroticism decreases from young adulthood to midlife and remains low into old age (Allemand et al., 2008; Lucas & Donnellan, 2009; Roberts et al., 2006; Terracciano et al., 2005). The maturity principle of personality development suggests that adaptive characteristics such as level of self-esteem should show age-related increases, whereas maladaptive characteristics such as self-esteem instability and contingency should decrease as people age.

### **The Present Research**

Our first goal was to examine age differences in self-esteem instability and contingency across the life span (for reasons of completeness, we also include analyses of self-esteem level in this research). We tested whether these characteristics of self-esteem show linear or nonlinear trajectories across the observed age range. Based on the theoretical considerations outlined above, we expected an age-related decrease in instability and contingency of self-esteem. Moreover, in line with previous research on age differences in self-esteem level (e.g., Orth et al., 2010; Orth et al., in press; Robins et al., 2002), we expected self-esteem level to increase, at least until about age 60 years.

Our second goal was to examine the effects of demographic variables and personality on the life-span trajectories of self-esteem instability and contingency. Previous research suggests that men and women do not differ in self-esteem instability (e.g., Greenier et al., 1999; Hayes,

Harris, & Carver, 2004; Zeigler-Hill, Chadha, & Osterman, 2008). With regard to self-esteem contingency, some studies report somewhat higher scores among women than men (e.g., Crocker et al., 2003; Sanchez & Crocker, 2005), whereas other studies find no gender difference (e.g., Cambron et al., 2010; Knee et al., 2008). A limitation is that most of these studies are based on student samples; therefore, only little is known about whether the results hold in midlife or old age. For the same reason, little is known about the effect of education on self-esteem instability and contingency (because education is relatively constant in student samples). With regard to personality, research about its effects on self-esteem instability and contingency is scarce. The few studies conducted generally found small to medium-sized effects of neuroticism on self-esteem instability (Roberts & Gotlib, 1997; Zeigler-Hill et al., 2008) and self-esteem contingency (Crocker et al., 2003), whereas the effects of the other Big Five personality traits (e.g., extraversion, agreeableness) are largely unexplored. We will therefore examine whether personality moderates the age trajectories of self-esteem instability and contingency, and whether age differences in personality account for age differences in the self-esteem characteristics (e.g., can change in self-esteem instability be explained by change in neuroticism during the same period?).

Our third goal was to test whether age differences in positive and negative affect account for the life-span trajectories of self-esteem instability and contingency. As noted above, research findings suggest that affective instability (the term instability is used synonymously with variability) and affective contingency (the term contingency is used synonymously with reactivity) decrease with age. Thus, it is possible that age differences in self-esteem instability and contingency merely reflect age differences in affective instability and contingency. However, in a diary study across several weeks Nezlek and Plesko (2003) found that, although



self-esteem instability and affective instability were related, self-esteem covaried with daily events even if the covariation between affect and daily events was controlled for. Therefore, we wanted to examine the degree to which the life-span trajectories of self-esteem instability and contingency are independent of age differences in the corresponding characteristics of general affect.

Finally, our fourth goal was to examine the interrelations between level, instability, and contingency of self-esteem across the life span. As noted above, previous research suggests that level of self-esteem is negatively related to instability and contingency of self-esteem. Again, however, it is important to note that the extant studies mainly used student samples. Thus, it is unknown whether the findings on interrelations between the three self-esteem characteristics hold across the life span.

## Methods

### Participants

The data come from the Berlin Diary Study (BDS; see Denissen, Butalid, Penke, & van Aken, 2008), a Web-based German-language study including daily assessments on up to 25 days. Participants were recruited by advertising the study on websites that list information about psychological surveys on the Internet and by postings in online forums. In the present research, we used data from 1,383 individuals (86% female) who provided at least five diary reports. Mean age of participants was 29.1 years ( $SD = 10.4$ , Range = 13 to 72). Four percent reported not having completed high school, 46% reported having a high-school diploma, 26% reported having some college, 22% reported having a master's degree, and 2% reported having a professional degree (e.g., Ph.D., M.D.).

### Procedure

First, participants completed a pretest questionnaire which assessed demographic variables, trait self-esteem, and the Big Five personality traits. Then, participants were invited to complete 25 daily assessments within 30 days; the daily questionnaire included measures of daily self-esteem, affect, and interpersonal conflicts. On each day, the questionnaire could be accessed between 9 p.m. and 4 a.m. The scales of the daily questionnaire were presented in randomized order to avoid the development of automatic response sets. On average, participants provided 19.9 daily reports ( $SD = 7.7$ ).

### **Trait Measures**

**Self-esteem level.** Self-esteem level was assessed with a German version (Ferring & Filipp, 1996) of the 10-item Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965). Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency was .89.

**Big Five personality traits.** Extraversion, agreeableness, conscientiousness, neuroticism, and openness were assessed with the German 42-item version (Lang, Lüdtkke, & Asendorpf, 2001) of the Big Five Inventory (BFI; John, Naumann, & Soto, 2008). Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency was .90 for extraversion, .72 for agreeableness, .84 for conscientiousness, .85 for neuroticism, and .84 for openness.

### **Daily Measures**

**Daily self-esteem.** Daily self-esteem was assessed with four items of the RSE (Rosenberg, 1965), which were adapted to measure state self-esteem (as used by Nezlek & Plesko, 2003). These items read: “Today, I was inclined to feel that I am a failure” (reverse coded), “Today, I took a positive attitude towards myself,” “Today, I was satisfied with myself,”

and “Today, I thought I am no good at all” (reverse coded). Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Across daily assessments, the average internal consistency was .86.

**Daily positive and negative affect.** Daily positive and negative affect was assessed with a German version of the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Responses were measured on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). Across daily assessments, the average internal consistency was .90 for positive affect and .89 for negative affect.

**Daily conflicts.** On each day, participants reported whether interpersonal conflicts occurred regarding the following topics: financial or material resources, communication, planning of joint activities, long-term life planning, social support, opinions or values, third persons, and any other topic that was not on the list. Each topic was assessed separately for relationship partner, friends, and family members. We aggregated all 24 items into an overall index of daily conflict.<sup>2</sup>

### **Computing Measures of Instability and Contingency**

**Instability.** For each participant, instability of self-esteem, positive affect, and negative affect were computed as the intraindividual standard deviation across daily assessments. The intraindividual standard deviation is the most widely used measure of instability of self-esteem (Kernis & Goldman, 2006) and affect (e.g., Eid & Diener, 1999).<sup>3</sup>

**Contingency.** The most widespread method to assess contingencies of self-esteem is using a self-report measure that asks people directly to what degree their self-esteem is contingent on events and changes in various life domains (e.g., Cambron et al., 2010; Crocker et al., 2003; Knee et al., 2008; Kernis & Goldman, 2006). However, some researchers have

questioned whether people are able to accurately rate how events (e.g., social disapproval) affect their self-esteem. For example, Leary et al. (2003) showed that disapproval clearly affected the self-esteem of even those individuals who were convinced that evaluations by others do not influence their self-feelings. A similar point has been made regarding the assessment of self-esteem instability. Empirical evidence suggests that people are unable to accurately rate the extent to which their self-esteem fluctuates. Rosenberg (1979) developed a self-esteem instability scale, which assesses self-perceived instability of an individual's self-esteem in a single administration. However, this measure of instability shows a strong negative correlation with level of self-esteem, but it is unrelated to measures of instability based on the intraindividual standard deviation across daily assessments as described above (e.g., Kernis et al., 1989). Given that it is difficult to accurately assess the extent to which one's self-esteem fluctuates (i.e., self-esteem instability), it is also likely to be difficult to accurately assess the extent to which these fluctuations are related to self-relevant events (i.e., self-esteem contingency). Therefore, in the present study we used an alternative measure of contingency.

The contingencies of self-esteem, positive affect, and negative affect were computed as the degree to which an individual's daily self-esteem and affect fluctuates in response to conflicts occurring on the same day (see Bolger & Zuckerman, 1995; Cohen, Gunthert, Butler, O'Neill, & Tolpin, 2005). This approach has been employed previously, although different labels such as lability (Butler et al., 1994) and reactivity (e.g., Bolger & Zuckerman, 1995; Cohen et al., 2005; Mroczek & Almeida, 2004) have been used. In line with research on age differences in emotional reactivity (e.g., Birditt et al., 2005), we focused on conflicts as antecedents of fluctuations in self-esteem and affect because interpersonal tensions have a particularly strong impact on self-esteem and affect (Baumeister & Leary, 1995).

Using the program HLM 6.06 (Raudenbush et al., 2004), we computed empirical Bayes estimates of each individual's unique association (slope) of daily conflicts with one of the outcome variables (i.e., self-esteem, positive affect, and negative affect), resulting in three separate measures of contingency. The slopes of conflicts predicting self-esteem and positive affect have been reverse-coded, so that for all contingency variables high scores indicate high contingency.

## Results

### Trajectories of Instability, Contingency, and Level of Self-Esteem Across the Life Span

Table 1 shows the means, standard deviations, and intercorrelations among the measures. Our first goal was to examine the life-span trajectories of the three self-esteem characteristics, instability, contingency, and level of self-esteem. For the analyses of trajectories, the self-esteem characteristics were converted to *z*-scores, so that trajectories could be compared across the different variables. Age was modeled as a continuous variable and was centered for the analyses. We regressed each self-esteem characteristic hierarchically on linear, quadratic, and cubic age and tested whether each step explained a significant amount of incremental variance. The analyses suggested linear trajectories for all self-esteem characteristics; quadratic and cubic age did not explain incremental variance in any of the outcomes.

Figure 1 shows the predicted trajectories. Age was negatively related to self-esteem instability ( $\beta = -.15, p < .05$ ) and self-esteem contingency ( $\beta = -.07, p < .05$ ), and positively related to self-esteem level ( $\beta = .15, p < .05$ ).<sup>4</sup> From age 13 to 72 years, self-esteem instability decreased by about three-quarters of a standard deviation ( $d = -0.84$ ), self-esteem contingency decreased by about a one-third standard deviation ( $d = -0.39$ ), and self-esteem level increased by about three-quarters of a standard deviation ( $d = 0.83$ ).

### **The Role of Demographic Variables and Personality**

Our second goal was to examine the role of demographic variables and personality in the relation between age and self-esteem characteristics. First, we investigated whether demographic variables (gender and education) and Big Five personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness) moderated the age trajectories of self-esteem characteristics. After controlling for the age effect, we regressed our self-esteem measures on demographic variables, personality variables, and terms representing interactions between age and demographic variables as well as age and personality variables. The measures of education and personality were centered for the analyses, and gender was examined as a dummy variable. None of the interactions between age and demographic and personality variables were significant. Thus, the shapes of the age trajectories of instability, contingency, and level of self-esteem replicated across gender, education, and personality.

Second, we tested whether age differences in personality account for the life-span trajectories of the self-esteem characteristics; for example, does self-esteem instability decrease with age because neuroticism decreases during the same period? After controlling for demographic variables and personality, age was still significantly related to self-esteem instability and self-esteem level but not to self-esteem contingency (Table 2). Thus, age differences in personality are only partially able to explain the life-span trajectory of self-esteem characteristics.

Third, and related to the previous question, we examined how personality is associated with the characteristics of self-esteem when age is controlled for (Table 2). Instability of self-esteem was predicted by neuroticism (with a medium-sized positive effect), conscientiousness (a small negative effect), and openness (a small positive effect). Contingency of self-esteem was

predicted by only one personality variable, i.e., neuroticism, which had a small positive effect. Finally, level of self-esteem was predicted by several of the personality variables: neuroticism had a strong negative effect, extraversion and conscientiousness had small to medium-sized positive effects, and openness had a very small positive effect.

### **Trajectories of Instability, Contingency, and Level of Self-Esteem Controlling for Positive and Negative Affect**

Our third goal was to test whether age differences in positive and negative affect account for the life-span trajectories of instability, contingency, and level of self-esteem; for example, and similarly to the reasoning above regarding the role of personality, does instability of self-esteem decrease with age because the instability of affect decreases during the same period? We therefore examined the trajectories of self-esteem characteristics controlling for positive and negative affect. More precisely, self-esteem instability was controlled for instability of positive and negative affect; self-esteem contingency was controlled for contingency of positive and negative affect; and self-esteem level was controlled for level of positive and negative affect.<sup>5</sup> Instability of self-esteem was predicted by instability of both positive and negative affect ( $\beta = .33$  and  $\beta = .39$ , respectively,  $ps < .05$ ). Affect instability explained 43% of the age effect (the percentage was computed by comparing the controlled with the uncontrolled unstandardized regression coefficient of age); however, after controlling for affect instability, age was still significantly related to self-esteem instability ( $\beta = -.08$ ,  $p < .05$ ). Contingency of self-esteem was predicted by contingency of both positive and negative affect ( $\beta = .39$  and  $\beta = .48$ , respectively,  $ps < .05$ ). Contingency of affect explained 52% of the age effect and rendered the age effect on self-esteem contingency nonsignificant ( $\beta = -.03$ ,  $ns$ ). Finally, level of self-esteem was predicted by level of both positive and negative affect ( $\beta = .39$  and  $\beta = -.40$ , respectively,  $ps < .05$ ). Level

of affect explained 66% of the age effect; however, after controlling for level of affect, age was still significantly related to self-esteem level ( $\beta = .05, p < .05$ ). Overall, affect characteristics had medium-sized to large effects on self-esteem characteristics and explained roughly about one half of the age effects on self-esteem characteristics.

### **Relations between Level, Instability, and Contingency of Self-Esteem Across the Life Span**

Our fourth goal was to examine the relations between level, instability, and contingency of self-esteem across the life span. For these analyses, we divided the sample into age groups: 13-19 years ( $n = 186$ ), 20-29 years ( $n = 672$ ), 30-39 years ( $n = 269$ ), 40-49 years ( $n = 190$ ), and 50 years and older ( $n = 66$ ). Table 3 shows the intercorrelations among the three self-esteem characteristics, separately for each age group and in the full sample. We first consider the correlations in the full sample and then test whether these relations varied as a function of age. Consistent with previous research (e.g., Crocker et al., 2003; Kernis et al., 2008; Okada, 2010), self-esteem level was negatively related to self-esteem instability and self-esteem contingency, and self-esteem instability and self-esteem contingency were positively correlated. The correlations were of small to medium size.

To test whether the relations between the self-esteem characteristics varied across age, we compared the fit of two multiple group path models. The models included covariances between all three variables (i.e., self-esteem level, self-esteem instability, and self-esteem contingency), estimated simultaneously in five age groups: in one model, the covariances were constrained to be equal across age groups, and in the other model the covariances were freely estimated. The  $\chi^2$ -difference test indicated that the cross-group constraints did not significantly decrease model fit,  $\Delta\chi^2(12) = 11.9, ns$ . Thus, the results suggest that the relations between self-esteem level, self-esteem instability, and self-esteem contingency do not differ across age groups.



### Discussion

We investigated age differences in instability, contingency, and level of self-esteem from age 13 to 72 years, using data from a large sample of participants in a diary study over 25 days. Instability and contingency of self-esteem decreased from adolescence to old age (the effect sizes were  $d = -0.84$  and  $d = -0.39$ , respectively), whereas level of self-esteem increased with age ( $d = 0.83$ ). Gender, education, and Big Five personality traits partially predicted the level of the trajectories (i.e., they had main effects), but did not moderate the slope of the trajectories (i.e., they did not interact with age). Thus, the shapes of the age trajectories of instability, contingency, and level of self-esteem replicated across gender, education, and personality.

We also controlled for characteristics of general affect (i.e., instability, contingency, and level of positive and negative affect). Affect characteristics had medium-sized to strong effects on the corresponding self-esteem characteristics: for example, instability of positive and negative affect predicted higher self-esteem instability. Importantly, however, age differences in instability and level of self-esteem were not simply due to age differences in affective characteristics (on the contrary, age differences in self-esteem contingency became nonsignificant when affective characteristics were controlled for). Thus, the age-related decrease in self-esteem instability and the age-related increase in self-esteem level do not merely reflect a decrease in affective instability and change in level of affect, respectively.

Moreover, the three characteristics of self-esteem (i.e., instability, contingency, and level) exhibited a stable pattern of intercorrelations across the life span. Instability was positively related to contingency, and self-esteem level was negatively related to both instability and contingency of self-esteem. All correlations were of small to medium size, which suggests that, although the self-esteem characteristics are related, they clearly represent distinct constructs. The

size of correlation between level and instability of self-esteem corresponds closely to the results from the meta-analysis by Okada (2010). Given that Okada's analysis was limited to samples of college students, the present research extends previous research by providing evidence on how self-esteem instability, contingency, and level are interrelated across the life span.

Overall, the present study suggests that self-esteem becomes more stable, less contingent, and higher with increasing age. This pattern of results is broadly consistent with previous research on development of self-esteem (e.g., Orth et al., 2010; Orth et al., in press; Shaw et al., 2010) and related constructs (e.g., Lodi-Smith & Roberts, 2010; Neff & Vonk, 2009). The findings are also largely consistent with the literature on personality development, as they reflect movement toward higher levels of maturity with increasing age (Roberts, Wood, & Caspi, 2008). Self-esteem is most closely associated with the personality traits of neuroticism, conscientiousness, and extraversion (Robins, Hendin et al., 2001; Robins, Tracy et al., 2001). On average, neuroticism decreases, conscientiousness increases, and extraversion shows minimal change across the life span (Allemand, Zimprich, & Hendriks, 2008; Lucas & Donnellan, 2009; Roberts, Walton, & Viechtbauer, 2006). The results of the present study suggest that self-esteem instability and contingency follow a trajectory that is similar to neuroticism and the mirror image of the trajectory of conscientiousness.

The present research provides further evidence on the gender difference—or, rather, similarity—in self-esteem. Women had somewhat more contingent self-esteem than men, but the effect size was very small. Moreover, men and women did not differ with regard to instability and level of self-esteem. Similarly, previous research on self-esteem typically found a small or even nonsignificant gender difference (Erol & Orth, 2011; Kling et al., 1999; Orth et al., 2010; Orth et al., in press; Robins, Hendin et al., 2001). Thus, the evidence suggests that the difference

between men's and women's self-esteem is at most small. Given the widespread belief that men have higher and more stable self-esteem than women and given the potential costs of false beliefs in gender differences (Hyde, 2005), the evidence on gender similarity in self-esteem is important.

A limitation of the present research is the cross-sectional study design. Trajectories that are based on cross-sectional data confound aging and cohort effects (Baltes, Cornelius, & Nesselrode, 1979). For example, it is possible that the age-dependent decrease in self-esteem contingency observed in the present study does not reflect actual developmental change but rather a tendency for individuals raised in the middle of the twentieth century to have less contingent self-esteem than those raised in more recent decades. It should be noted, however, that research using cohort-sequential longitudinal data on constructs such as self-esteem (Orth et al., 2010; Orth et al., in press) and the Big Five personality traits (Terracciano et al., 2005) typically shows weak, and often nonexistent, cohort differences, as does research tracking secular changes in narcissism and self-enhancement with data collected over the past several decades (Trzesniewski & Donnellan, 2010; Trzesniewski, Donnellan, & Robins, 2008). Therefore, to the extent that cohort effects are assumed to be minimal, the pattern of age differences observed in cross-sectional studies may be a reasonable starting point to examine age trajectories. Nevertheless, in future research on the development of self-esteem instability and contingency, researchers should use repeated assessments of instability and contingency (across several years) to directly test for the possible bias caused by cohort effects.

The approach used for the measurement of self-esteem contingency may be considered as both a limitation and strength of the present research. On the one hand, a limitation is that the measure was specific for one domain (i.e., interpersonal relationships) and that other domains

such as competence, appearance, and virtue were not examined (see Crocker et al., 2003). However, evidence provided by sociometer theory (Leary & Baumeister, 2000; Leary, Tambor, Terdal, & Downs, 1995) suggests that the interpersonal domain is of particular importance for people's self-esteem (see also Crocker et al., 2003; Crocker & Luhtanen, 2003; Lemay & Ashmore, 2006; Srivastava & Beer, 2005). Nevertheless, future research should study the life-span development of self-esteem contingencies in additional domains. On the other hand, a strength of the contingency measure used is the more objective and nonreactive approach: whereas most previous research relied on self-assessed contingency of self-esteem (requiring a considerable amount of accurate introspection), we computed individual contingency coefficients that capture the strength of intraindividual association between daily events and daily self-esteem across a series of 25 days. This statistical approach probably provides for a more accurate and more valid measure of self-esteem contingency than self-report methodology. However, as long as research on the empirical overlap of these two types of measures is lacking, findings from studies using a statistical approach should be compared with caution with findings from studies using self-report measures.

The data were collected via the Internet, which raises concerns about sample selectivity. Sometimes, web-based studies are critiqued because the participants are necessarily limited to people who have Internet access. In the past, Internet users tended to be individuals with higher socioeconomic status (SES), but more recent studies suggest that Internet samples are relatively diverse in terms of SES (Gosling, Vazire, Srivastava, & John, 2004; Soto, John, Gosling, & Potter, 2008). Moreover, the available evidence suggests that data collected via the Internet are generally as reliable and valid as data collected via paper-and-pencil methods (Chuah, Drasgow, & Roberts, 2006; Denissen, Neumann, & van Zalk, 2010; Gosling et al., 2004). However, a

possible disadvantage of Internet samples is that the observed age differences may be confounded by age-varying sample selectivity; for example, although Internet users at age 20 years or age 30 years might be relatively representative for their age groups, older Internet users might deviate more strongly in important characteristics from their age group. In the present study, the gender ratio and the level of education varied by age groups. Males were more strongly underrepresented in the younger than in the older age groups and participants of the second oldest age group were less educated than those in most other age groups. However, note that we controlled for these demographic variables in our analyses. Furthermore, the general pattern that people's self-esteem tends toward higher levels of adjustment across the life course is in line with previous research on self-esteem level (Orth et al., 2010) and neuroticism (Lucas & Donnellan, 2009) based on representative samples. Nevertheless, future research on age differences in instability and contingency of self-esteem should use probability samples.

Moreover, future research should examine age differences in self-esteem instability and contingency in countries from diverse cultural contexts, such as Asian and African cultures (cf. Arnett, 2008). For example, individuals from Asian and Western cultures show different self-construal styles and different tendencies toward self-enhancement (Heine, Lehman, Markus, & Kitayama, 1999; Markus & Kitayama, 1991), which may have important consequences for the level and shape of age trajectories in self-esteem characteristics. Therefore, whether studies with samples from other cultural contexts would yield the same results as the present study is unknown.

In conclusion, the present research contributes to our understanding of the life-span development of two self-esteem characteristics—i.e., instability and contingency—that are important for psychological adjustment and behavior. Previous research on age-related changes

in self-esteem focused on the level of self-esteem and showed that self-esteem increases from adolescence to at least about age 60. The present research suggests that self-esteem also becomes more stable and less contingent with increasing age, regardless of gender, education, and personality. Overall, the findings suggest that people's self-esteem tends towards higher levels of adjustment across the life course.

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## Footnotes

<sup>1</sup> Rosenberg (1986) proposed distinguishing between baseline instability and barometric instability. Baseline instability refers to long-term changes in a person's trait self-esteem that occur gradually over an extended period (e.g., years). As noted above, long-term changes in trait self-esteem have been studied in previous research (see also Trzesniewski, Donnellan, & Robins, 2003). In contrast, barometric instability refers to short-term fluctuations in a person's state self-esteem that occur within short time periods (e.g., days). The latter conceptualization of instability is the focus of the present research.

<sup>2</sup> We did not compute coefficient alpha for the index of daily conflicts. Coefficient alpha is not an appropriate measure of reliability for this scale because it is an emergent not latent construct, defined by an aggregation of relatively independent indicators (see Bollen & Lennox, 1991; Streiner, 2003).

<sup>3</sup> General trends over the course of the study (e.g., a linear increase in daily self-esteem) could produce variance in the measures that does not represent daily instability in self-esteem and affect. We therefore controlled whether the results hold when the instability measures are computed using detrended data (i.e., data from which intraindividual trends have been removed). Detrended data were created by regressing daily self-esteem on time (days) for each participant, using the program HLM 6.06 (Raudenbush, Bryk, Cheong, & Congdon, 2004), and by saving the daily residuals. The detrended instability measures correlated .99 with the nondetrended instability measures, and the trajectories of the detrended instability measures were almost identical to the trajectories of the nondetrended instability measures.

<sup>4</sup> We conducted further analyses to control for possible biases of the estimates. First, Baird, Le, and Lucas (2006) showed that ignoring differences in the level of a construct may lead

to wrong conclusions about the relations between variability of this construct and third variables. However, when controlling for the level of daily self-esteem (i.e., the within-person mean), age was still significantly related to self-esteem instability ( $\beta = -.08, p < .05$ ). Second, individual differences in study compliance might affect the reliability of the measures of self-esteem instability and contingency. However, when controlling for study compliance (operationalized as the number of daily assessments provided by participants), age was still significantly related to self-esteem instability ( $\beta = -.13, p < .05$ ) and self-esteem contingency ( $\beta = -.07, p < .05$ ).

<sup>5</sup> We used aggregates of positive and negative affect across the daily assessments as measures of level of positive and negative affect, respectively.

Table 1

*Means, Standard Deviations, and Intercorrelations Among Measures*

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Self-esteem instability	0.61	0.27	--										
2. Self-esteem contingency	1.60	0.79	.29*	--									
3. Self-esteem level	3.58	0.90	-.37*	-.16*	--								
4. Extraversion	3.34	0.82	-.14*	-.06*	.54*	--							
5. Agreeableness	3.54	0.57	-.14*	-.08*	.30*	.23*	--						
6. Conscientiousness	3.46	0.64	-.19*	-.05	.37*	.24*	.25*	--					
7. Neuroticism	3.16	0.77	.31*	.12*	-.64*	-.39*	-.33*	-.25*	--				
8. Openness	3.84	0.61	-.01	-.05	.25*	.36*	.13*	.14*	-.15*	--			
9. Instability of positive affect	0.56	0.19	.47*	.06*	.02	.12*	-.05	.00	.06*	.17*	--		
10. Contingency of positive affect	0.78	0.28	.04	.56*	.17*	.18*	.01	.10*	-.09*	.10*	.14*	--	
11. Instability of negative affect	0.51	0.22	.59*	.26*	-.26*	-.08*	-.11*	-.12*	.31*	.02	.28*	.10*	--
12. Contingency of negative affect	2.13	0.90	.11*	.62*	.06*	.02	-.01	.06*	.02	-.04	.09*	.37*	.28*

\* $p < .05$ .

Table 2

*Standardized Regression Coefficients of Age, Gender, Education, and Big Five Personality*

*Traits Predicting Instability, Contingency, and Level of Self-Esteem*

Predictor	Self-Esteem		
	Instability	Contingency	Level
Age	-.10*	-.04	.04*
Gender <sup>a</sup>	.01	.06*	.01
Education <sup>b</sup>	-.06	-.01	.10*
Extraversion	-.03	-.01	.30*
Agreeableness	-.02	-.05	.02
Conscientiousness	-.10*	.00	.16*
Neuroticism	.27*	.08*	-.46*
Openness	.06*	-.03	.04*

*Note.* All predictors were entered simultaneously into the regression equations.

<sup>a</sup> Positive coefficients indicate that women scored higher than men.

<sup>b</sup> Positive coefficients indicate that more educated individuals scored higher than less educated individuals.

\*  $p < .05$ .

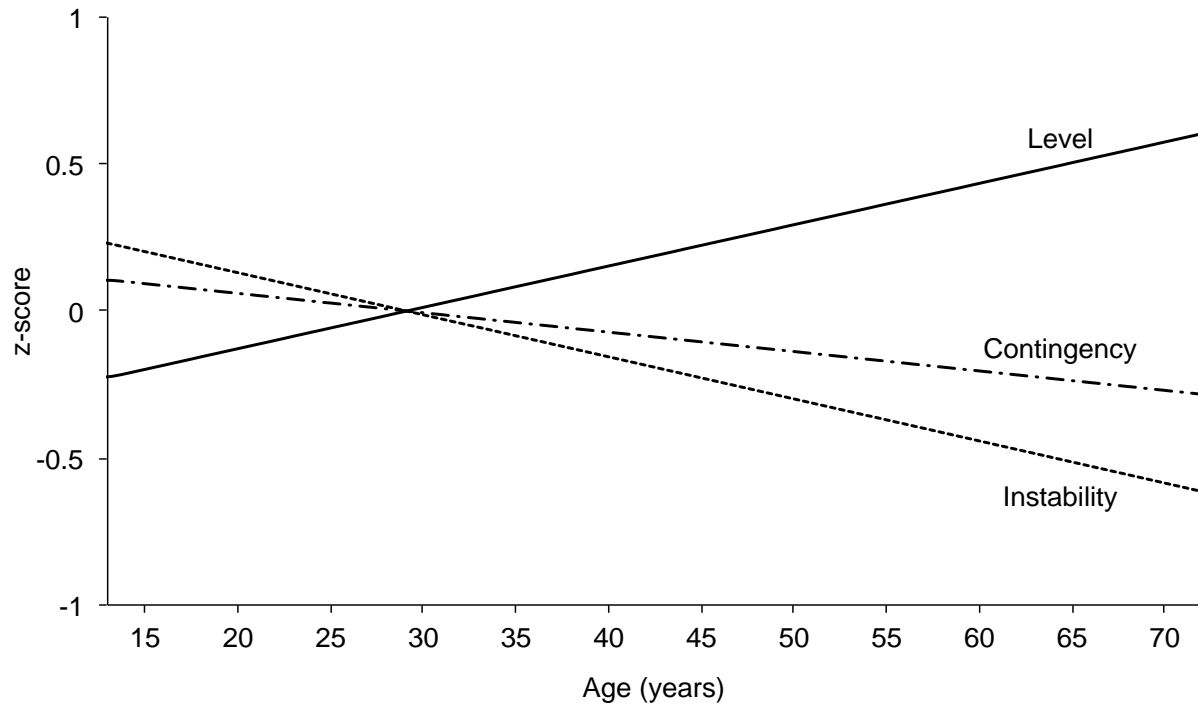
Table 3

*Intercorrelations Among Self-Esteem Characteristics Across Age Groups*

Self-esteem characteristics	Age groups					Full sample
	13-19	20-29	30-39	40-49	50+	
Level and instability	-.40*	-.32*	-.35*	-.44*	-.39*	-.37*
Level and contingency	-.23*	-.10*	-.22*	-.17*	-.16	-.16*
Instability and contingency	.24*	.24*	.38*	.34*	.29*	.29*

*Note.* Age is given in years.

\*  $p < .05$ .



*Figure 1.* Trajectories of instability, contingency, and level of self-esteem from age 13 to 72 years. Measures were converted to  $z$ -scores for the analyses.