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Running Head: SELF-ESTEEM ACROSS THE SECOND HALF OF LIFE

Self-Esteem Across the Second Half of Life: The Role of Socioeconomic Status, Physical Health, Social Relationships, and Personality Factors

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### Abstract

Self-esteem development across adulthood has been in the center of interest for some time now. However, not much is known about factors that shape self-esteem and its development in the second half of life and whether the factors differ with age and gender. To examine these questions, this study uses two-wave data from the population-based NorLAG study in Norway ( $N = 5,555$ ;  $M_{\text{age}} = 58$  years; 51% women) and combines self-report data on self-esteem and personality with registry-based information on socioeconomic status (education, income, unemployment), health problems (sick leave, lifetime history of disability), and social relationships (cohabitating partner, lifetime history of divorce and widowhood). Results from latent change score models revealed that self-esteem peaked at around age 50 and declined thereafter. More importantly, lower socioeconomic status, not having a cohabitating partner, unemployment, and disability were each uniquely associated with lower levels of self-esteem and/or steeper declines in self-esteem over the five-year study period. Over and above registry-based information, personality characteristics were relevant, with a more mature personality being associated with higher self-esteem level. Emotionally stable participants also showed less pronounced declines in self-esteem. Moreover, associations of disability and of emotional stability with self-esteem level were weaker with advancing age. Among women, self-esteem level was more strongly associated with emotional stability and less strongly with openness, compared to men. Our findings demonstrate the utility of registry-based information and suggest that physical health, social relationships, and personality factors are in manifold ways uniquely associated with self-esteem and its development later in life.

*Keywords:* self-esteem, register data, old age, physical health, relationships

## Self-Esteem Across the Second Half of Life: The Role of Socioeconomic Status, Physical Health, Social Relationships, and Personality Factors

Self-esteem is defined as an individual's general attitude towards or evaluation of the self and reflects people's beliefs about how worthy they are as a person (Blascovich & Tomaka, 1991; Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). The importance of self-esteem as a fundamental psychological construct has been emphasized by research showing self-esteem to predict future outcomes such as good physical and mental health, satisfaction in close relationships, social support, and also labor force participation and economic prospects across adulthood (Orth & Robins, 2014; Trzesniewski et al., 2006). It is thus of key importance to better understand the conditions under which self-esteem thrives. However, little is known about factors that shape self-esteem and its development across adulthood and whether these operate in age- and gender-specific ways. This report moves one step further by making use of self-report and register-based information that cover socioeconomic status (SES), health problems, social relationships, and personality to examine antecedents and correlates of self-esteem across the second half of life. Specifically, we use two-wave data from the population-based NorLAG study in Norway ( $N = 5,555$ ;  $M_{\text{age}} = 58$  years at baseline; 51% women) and examine three sets of questions. First, how does self-esteem change across adulthood and old age? Second, what are the unique roles of current conditions and lifetime history of SES (education, income, unemployment), health problems (sick leave, disability), and social relationships (cohabitating partner, divorce, widowhood) as well as Big Five personality traits for level and development of self-esteem across the second half of life? Third, does the relevance of these factors differ across age and gender?

### **Self-Esteem and Its Development Across the Second Half of Life**

Theoretical accounts in personality and developmental psychology, including social investment perspectives (Roberts, Wood, & Smith, 2005) and lifespan developmental perspectives (Baltes, Lindenberger, & Staudinger, 2006) emphasize the importance of social role changes for personality development across the lifespan. In accordance with these perspectives, it has been proposed that through young and middle adulthood people invest heavily in socially rewarding roles in the areas of intimate relationships, family life, and work. These investments, in turn, are said to result in more mature personality and gradual increases in self-esteem (Orth, Maes, & Schmitt, 2015). However, in old age, reductions in social networks and compromised health may undermine people's self-esteem (Orth et al., 2015). Several large-scale longitudinal studies have largely supported age trends of that kind, reporting self-esteem to peak in midlife at around age 50, followed by a phase of mean-level decline (for an overview, see Orth & Robins, 2014). However, the research studies do not agree on the average size of the decline in old age. Some studies have reported steep forms of decline; others have found that the rate of decline is rather minor. For example, Orth and colleagues (Orth, Robins, & Widaman, 2012; Orth, Trzesniewski, & Robins, 2010) have reported from two long-term longitudinal studies that mean levels of self-esteem decrease by about two thirds of a standard deviation from age 60 onwards. In contrast, in three further independent longitudinal studies Wagner and colleagues (Wagner, Gerstorf, Hoppmann, & Luszcz, 2013; Wagner, Hoppmann, Ram, & Gerstorf, 2015; Wagner, Lang, Neyer, & Wagner, 2014) have found modest rates of decline, amounting to no more than one fifth of a standard deviation per 10 years. In the context of these conflicting findings, this study examines mean-level change in self-esteem from midlife to old age using long-term longitudinal data from a population-based national sample from a Northern European country.

### **Predictors of Level and Change in Self-Esteem**

The second and primary aim of this study is to examine variables from a variety of different life domains as predictors of level and change in self-esteem across the second part of life. We draw from two broad theoretical perspectives to provide insights into factors that may influence self-esteem. First, according to the *intrapersonal* perspective, as originally proposed by William James (1890), global self-esteem is based on people's own perceptions of how adequately they perform in domains where they consider success to be important. People's resources, abilities, and competence in important areas of life are thus expected to shape self-esteem. Second, the *interpersonal* perspective, dating back to Cooley's (1902) and Mead's (1934) notions in the framework of symbolic interactionism, emphasizes the role of social influences in shaping self-esteem. This perspective largely considers self-esteem to be a result of internalizations of others' perceptions and evaluations of oneself. A prominent contemporary variant of the interpersonal perspective is sociometer theory, which proposes that the major function of self-esteem is to monitor threats of social exclusion (Leary, Tambor, Terdal, & Downs, 1995).

Both perspectives provide important predictions about factors that may influence self-esteem: The intrapersonal perspective's focus on a person's own abilities and resources would predict that factors related to high SES, such as wealth, education, and high status occupations are sources of self-esteem in adults. Good physical health would also be considered to be an important individual resource relevant for self-esteem and its development. Likewise, the intrapersonal perspective predicts that basic personality traits that promote one's own status may be of importance.

The interpersonal perspective and sociometer hypothesis would predict that factors determining social integration influence self-esteem. Social relations and particularly close social ties, such as those with one's spouse, would then be of importance for self-esteem. Also for this

perspective, SES and physical health may be of importance, because low SES and health problems may lead to social marginalization. Moreover, personality traits facilitating the establishment and maintenance of close social ties are relevant for the interpersonal perspective.

In summary, the two broad conceptual perspectives predict that a variety of demographic, health, and psychosocial factors are important sources of self-esteem. Despite differences in fundamental assumptions underlying the two perspectives, their predictions are complementary rather than competing. This study explores a comprehensive number of factors considered by the two perspectives to influence self-esteem. The factors include indicators of SES (education, income, unemployment), physical health (sick leave, disability), social ties (cohabitating partner, divorce, widowhood), and measures of broad personality characteristics. A more detailed account of the predictions of the two perspectives and previous research on predictors of self-esteem is presented in the following.

**Socioeconomic status.** Following the intrapersonal perspective, SES is an evident candidate as a source of self-esteem, because factors such as high education, high income, and high status occupations are generally highly valued in Western societies. Moreover, low SES may lead to social marginalization and may therefore be important for self-esteem according to the interpersonal perspective. A meta-analysis (Twenge & Campbell, 2002) provided empirical support for cross-sectional associations between SES and self-esteem, concluding that indicators of SES had small but significant associations with individual differences in self-esteem. Longitudinally, however, studies have typically not found evidence for associations of SES indicators (education, income, occupational status) with rates of change in self-esteem (Orth et al., 2010; Wagner et al., 2014).

**Physical health.** Physical health may also shape self-esteem, according to the intrapersonal perspective, because health problems may make it difficult for individuals to live up

to their own expectations in domains where physical health is an advantage for successful performance. Physical health problems may also compromise opportunities for rewarding social engagement and relationships, which in turn may undermine self-esteem according to the interpersonal perspective. These notions have received support in that cross-sectional associations have been found between indicators of subjective health and levels of self-esteem (Erol & Orth, 2011; Wagner et al., 2014). Longitudinally, empirical studies have found no or only very small associations between self-reports of physical health and changes in self-esteem across the adult lifespan (Orth et al., 2012; Wagner, Gerstorf, et al., 2013). However, a recent study indicated that in old age, people with moderate to severe physical health conditions as diagnosed by physicians reported considerably stronger declines in self-esteem compared to people without such physical health issues (Wagner, Hoppmann, et al., 2015). With this background, we conclude that a more comprehensive investigation of physical health that moves beyond simple self-reports may help us better understand associations between physical health and self-esteem.

**Social relationships.** Following the interpersonal perspective, social relationships are of particular importance for self-esteem. A natural point of departure for examining the perspective are close and intimate relationships, because temporally stable and affectively pleasant relationships are considered to be fundamental for satisfying the basic human need of belongingness (Baumeister & Leary, 1995). As a consequence, self-esteem serves as a monitor for the degree of social inclusion. Empirical research has indeed shown that being married or having a partner is cross-sectionally correlated with higher levels of self-esteem (Wagner et al., 2014). Longitudinally, several studies on young adults have demonstrated that establishing intimate relationships (in certain time windows) is associated with increases in self-esteem (Lehnart, Neyer, & Eccles, 2010; Neyer & Asendorpf, 2001; Wagner, Becker, Lüdtkke, &

Trautwein, 2015). However, differences of this kind in rates of self-esteem change have not been observed with a lifespan sample (Wagner et al., 2014). Whether or not associations between romantic relationships and self-esteem generalize to the second half of life is still an open question. For example, close relationships may be of even greater importance for self-esteem in old age, when social network size typically decreases as a result of changes in social roles and life circumstances (Wrzus, Hanel, Wagner, & Neyer, 2013), such as retirement and children leaving the parental home.

Experience of marital or partnership dissolution, be it through divorce or the death of a partner, may constitute another powerful source of individual differences in self-esteem. Obviously, partnership dissolution in itself represents a threat of social isolation, because individuals lose a potentially important source of support. Divorce and widowhood among older adults influence social ties to other persons as well. For example, adult offspring of divorced parents have less contact with their parents and perceive the quality of their relationship to parents to be poorer than offspring of married parents do (Herlofson, 2013). Smaller social networks as a direct or indirect consequence of partnership dissolution may, in turn, reduce self-esteem, because these decreases in social networks will probably be accompanied by increased feelings of social isolation. However, the available empirical evidence is scarce and inconclusive. Of the few cross-sectional studies available, one report indicated that self-esteem is indeed higher among people who are currently married than among persons who were previously married (including both divorced and widowed; McMullin & Cairney, 2004), whereas another report found no association between self-esteem and relationship dissolution through divorce or death of a partner (Lee & Shehan, 1989).

**Personality.** Both theoretical perspectives predict that broad personality traits are of importance for self-esteem. The intrapersonal perspective's emphasis on abilities and resources



suggests that personality traits promoting successful performance in society are relevant. For example, extraversion and openness have been proposed to promote personal growth and agency (Digman, 1997; Paulhus & John, 1998) and may thus be important sources of self-esteem. Conscientiousness is also relevant for the intrapersonal perspective, because conscientiousness predicts highly valued achievements such as academic and job performances (Barrick, Mount, & Judge, 2001; Poropat, 2009). Theoretical accounts also relate neuroticism to the intrapersonal perspective, because neuroticism is usually conceptualized as individual differences in the general ability to handle stress (Denissen & Penke, 2008). Stress and negative experiences may have less negative effects on performance and evaluation of one's own abilities among emotionally stable individuals (i.e., among persons with low degrees of neuroticism) than among emotionally unstable individuals, leading in turn to the maintenance of higher levels in self-esteem, particularly under stressful life conditions.

Most Big Five personality traits are also relevant for the interpersonal perspective, because they are important for facilitating or maintaining social ties. Agreeableness and conscientiousness have been found important because these personality traits are associated with motives of nurturance and close relationships (Paulhus & John, 1998). Moreover, extraversion may as well improve social integration, because it promotes social behavior like dating and attending parties (Paunonen, 2003). Neuroticism may also be of importance, because it has been suggested that neuroticism is closely related to individual differences in sensitivity to signs of social exclusion (Denissen & Penke, 2008). In this case, threats to social inclusion may be of lesser importance in determining self-esteem for emotionally stable individuals than for emotionally unstable persons.

Empirical research has found considerable cross-sectional associations between high self-esteem and high levels of emotional stability, extraversion, and conscientiousness (Erol & Orth,

2011; Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001; Wagner et al., 2014), whereas associations are typically weaker for agreeableness and openness (Erol & Orth, 2011; Robins et al., 2001; Wagner et al., 2014). To the best of our knowledge, only two studies have examined how Big Five personality traits are longitudinally related to self-esteem, with conflicting findings: One study concluded that there were by and large no prospective associations (Erol & Orth, 2011), but another study found that all Big Five personality traits were related to changes in self-esteem over time (Wagner, Lüdtkke, Jonkmann, & Trautwein, 2013). More specifically, the results of the latter study indicated that low neuroticism and high extraversion, openness, agreeableness, and conscientiousness are related to higher self-esteem across time. The striking differences between the two studies may be due to different analytical approaches, because one study examined the unique contribution of each personality trait to changes in self-esteem, adjusting for all other traits (Erol & Orth, 2011), whereas the other study did not perform such adjustments (Wagner, Lüdtkke, et al., 2013). More research is thus needed to examine the link between personality and self-esteem more thoroughly. Moreover, studies examining middle adulthood and old age may be of particular importance because both of the existing studies covered only the adolescent and young adult years.

### **The Role of Age and Gender**

It is well possible that the above noted associations between psychosocial factors and self-esteem differ with age. Drawing from lifespan psychological notions (Baltes et al., 2006; Gerstorf & Ram, 2013), Wagner et al. (2014) have argued that certain resources are probably more important for solving age-related challenges in one phase of life, whereas other resources are more important for solving age-related challenges in a later phase of life. For example, resources related to education may be of greater importance for self-esteem in adolescence and young adult years than in older ages, because educational achievements in this period may be particularly

relevant for future career and work life. In a similar vein, with physical health challenges becoming increasingly frequent and severe, it is important for older adults to gradually dissociate their self-esteem from the health domain and turn towards domains over which they have more control (Wagner et al., 2014). Initial evidence from cross-sectional studies can be interpreted to be consistent with this notion. In particular, associations of subjective health and of neuroticism with self-esteem have been found to be weaker in older adults than in younger adults (Wagner et al., 2014). In a similar vein, associations of SES with self-esteem have been found to follow an inverse u-shaped curve, in that associations were stronger at around age 60 than earlier in life and were weaker thereafter (Twenge & Campbell, 2002). However, systematic research on age differences in associations between a comprehensive number of potential predictors and self-esteem is sparse.

Associations with self-esteem may also differ by gender, because in accordance with cultural norms, men and women may value specific resources and abilities differently. For example, gender differences in social relationship variables are plausible, because research indicates that men rely to a greater degree on their spouse for emotional intimacy and that women in general have a broader network of intimate relationships (Hatch & Bulcroft, 1992). In line with this notion, empirical reports have found that being single and experiencing relationship dissolutions are more detrimental to men's psychosocial adjustment than women's (Cooney & Dunne, 2001). In contrast, studies have typically not found that associations between education and self-esteem differ by gender (Orth et al., 2015; Orth et al., 2010).

Concerning personality, agentic traits (e.g., extraversion), which are typically ascribed to men, may be of greater importance for men's self-esteem, whereas communal traits (e.g., agreeableness), which are typically ascribed to women, may be of greater importance for women's self-esteem (Eagly, 2009). Empirical research has indeed found evidence consistent

with these ideas. To illustrate, in a large-scale cross-sectional study ( $N > 300,000$ ), Robins et al. (2001) found that correlations between self-esteem and personality traits differ by gender, with correlations with extraversion, conscientiousness, and openness being stronger among men, and correlations with agreeableness and emotional stability being stronger among women. Even though the gender differences were modest in size, the results indicate gender stereotypic patterns, with communal traits having stronger associations with self-esteem among women and agentic traits having stronger associations with self-esteem among men (Robins et al., 2001). We note, however, that the available evidence on moderating effects of gender is scarce and limited to a selected set of sociodemographic and personality variables.

### **The Present Study**

In this report, we (i) examine mean-level change in self-esteem from midlife to very old age, (ii) test the role of SES, health, social relationships, and personality factors for predicting self-esteem levels and its change, and (iii) explore whether associations differ by age and gender. To do so, we apply latent change score models to a two-wave longitudinal national study of 5,555 Norwegian adults initially aged 40 to 80 years. Moving one step ahead, our study targets the nature and correlates of self-esteem in the second half of life (rather than in adolescence and young adulthood), examines the unique predictive effects of a comprehensive set of conceptually motivated antecedents and correlates (rather than a few variables only), and uses registry data that reliably cover the lifetime history of several major life events, including disability, divorce, and widowhood (as opposed to self-reports about current conditions only). In particular, we combine self-report data on self-esteem and personality with registry-based information about SES (education, income, unemployment), health problems (sick leave, lifetime history of disability), and social relationships (cohabitating partner, lifetime history of divorce, lifetime history of widowhood). We expect that factors from all four domains will be correlated with

levels of self-esteem. Moreover, as indicated by previous research, we expect health problems and social relationships to predict changes in self-esteem, whereas associations of SES and personality with changes in self-esteem are less probable. Associations between health problems and self-esteem may be particularly prone to be attenuated with increasing age, whereas gender differences in associations with self-esteem are expected for relationship variables and personality traits.

## **Methods**

### **Sample and Procedure**

Data from the population-based Norwegian Life Course, Aging, and Generation (NorLAG) study was used in this study (for a detailed account of data collection procedures, see Slagsvold et al., 2012). Data was collected in two waves. At the first wave (T1) in 2002, a representative sample of non-institutionalized adults aged 40 to 79, stratified by age and gender, was drawn from 30 municipalities in Norway representing different geographic regions. Respondents were initially contacted through telephone interviews, and then followed up by using a postal questionnaire. Data from nationwide official registries was added after respondents gave informed consent. Of 8,298 individuals who were asked to participate, 5,555 (67.0%) were interviewed, and 4,149 completed the questionnaire (74.6% of those who were interviewed; combined response rate 50.0%).

The second wave (T2) was conducted in 2007, when all those who had participated in T1 were asked to be interviewed by telephone again (aged 45 to 84 years at T2). Between T1 and T2, 265 persons had died, and another 25 had moved abroad, reducing the sample to be approached to 5,269 individuals. The same data collection methods as at T1 were used, and 3,774 persons participated in the telephone interviews (71.6% of those eligible to participate at T2). Moreover, 2,984 completed the T2 questionnaire (79.1% of those participating in the telephone interview).

In this study, all persons who participated at least in the telephone interview at T1 were included ( $N = 5,555$ ;  $M_{\text{age}} = 57.9$  years; 51.4% women).

As reported in prior publications (Slagsvold et al., 2012), participation bias at T1 was small concerning gender, place of living, and age. However, participation rates were markedly higher among those with high education compared to those with lower education (Slagsvold et al., 2012). To examine sample attrition over the study period, we conducted two sets of selectivity analyses. First, we compared respondents at T1 who completed the questionnaire after the telephone interview with those who only participated in the telephone interview. Respondents did not differ significantly in age ( $p > .05$ ); however, participants who completed the questionnaire had more years of education compared to non-participants (Cohen's  $d = 0.29$ ,  $p < .001$ ), they reported slightly higher earnings ( $d = 0.10$ ,  $p < .01$ ) and slightly higher self-esteem on the four items assessed by telephone interview ( $d = 0.10$ ,  $p < .001$ ), they were more often women (52.5% versus 48.2%,  $p < .01$ ), they were less likely to have received a disability pension (14.6% versus 17.6%,  $p < .01$ ), and they were more likely to have a live-in partner (72.4% versus 64.5%,  $p < .001$ ). Second, we examined if and how respondents who remained in the study at both data waves differed from those who were not available for reassessment at T2. Respondents who stayed in the study were younger ( $d = 0.61$ ,  $p < .001$ ), had more years of education ( $d = 0.46$ ,  $p < .001$ ), had higher earnings ( $d = 0.23$ ,  $p < .001$ ), reported slightly higher self-esteem ( $d = 0.17$ ,  $p < .001$ ), and more often had a live-in partner (74.3% versus 63.2%,  $p < .001$ ). Gender and a history of disability pension were not significantly related to attrition ( $p > .05$ ). Conjointly, our analyses indicated selectivity effects of moderate size for age and education, as measured by Cohen's  $d$ ; group differences for other variables were of minor size.

## Measures

**Self-esteem.** The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was used at both data collection waves. This 10-item measure is designed to assess general feelings of self-worth and is the most widely used measure of self-esteem (Blascovich & Tomaka, 1991). Participants used a 5-point response scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale was translated into Norwegian and back-translated into English by independent translators to ensure the adequacy of the Norwegian translation. Norwegian translations of the RSES have been shown to have good psychometric properties, comparable to those of the English original version (von Soest, 2005). In the present study, four of the items were assessed by telephone interview, and the remaining six items were assessed by questionnaire. Internal consistency was  $\alpha = .80$  at T1 and  $\alpha = .82$  at T2.

**Personality.** At T1, Big Five personality traits were assessed by a short version of the 5-Personality Factors – adjective (5-PFa) instrument (Engvik, 1993), which was included in the questionnaire. The instrument contains adjective-anchored bipolar items (e.g., “friendly – unfriendly”; “extravert – introvert”), which are rated on 7-point scales. Each of the Big Five personality traits extraversion, agreeableness, conscientiousness, neuroticism, and openness were assessed by four items. The instrument was developed in Norwegian and has shown good validity and reliability (Engvik, 1993). For a less complex presentation of the results, the neuroticism subscale was reversed, such that this subscale indicated emotional stability instead of neuroticism. In this study, internal consistency was  $\alpha = .74$  for emotional stability,  $\alpha = .58$  for extraversion,  $\alpha = .71$  for conscientiousness,  $\alpha = .69$  for agreeableness, and  $\alpha = .66$  for openness. The moderate reliabilities reflect the heterogeneity of the items selected to measure relatively broad constructs and are comparable to other brief personality scales (Donnellan, Oswald, Baird, & Lucas, 2006; Lang, John, Lüdtke, Schupp, & Wagner, 2011).

**Register data.** Self-report data were linked with four sets of data from nationwide official registries, as provided by Statistics Norway. To begin with, age and gender were assessed by register data. Second, as an indicator of SES, education was divided into five categories, ranging from 1 (*completed junior high school or lower*) to 5 (*completed higher university degree*). Because the general level of education in the population had increased in more recent birth cohorts, we standardized education separately for each year of birth, such that education scores represent the level of education for a respondent measured in standard scores, compared to all other respondents born in the same year.

Respondents' income in the year of T1 (i.e., 2002) was also assessed by register data (in Norwegian kroner per year). Because income is related to respondents' age, we standardized income for each birth cohort, in the same way as education was standardized. The measure obtained thus provided an indication of income compared to other respondents' incomes within the same birth year. We also assessed whether respondents were unemployed the year that they participated at T1.

Third, as indicators of health problems, we obtained register data on whether respondents had a history of receiving a disability pension from 1991 or later (yes/no). Moreover, we assessed by register data whether the respondent was on sick leave the year of T1 for two weeks or more at a stretch (yes/no).

Finally, relationship variables were also assessed with register data. We used the information on whether the respondents had a cohabitating partner at the time of T1 (yes/no). Based on register data, we constructed a variable indicating whether the respondents at any time after 1974 had experienced a divorce (yes/no) or experienced widowhood (yes/no). Data on divorce and widowhood history were only available for respondents who participated in the study at T2.

### **Statistical Analyses**



We conducted our analyses in a structural equation modeling framework, using Mplus 7.3 (Muthén & Muthén, 2012). Missing data were accommodated using full information maximum likelihood under the usual missing at random assumptions underlying longitudinal designs (Little & Rubin, 1987; Preacher, Wichman, MacCallum, & Briggs, 2008; Schafer & Graham, 2002). We note that the correlates included in our models represent attrition-informative variables and so helped to accommodate longitudinal selectivity under the assumption that incomplete data were missing at random (i.e., missingness may have been related to these variables; McArdle, 1994).

Analyses were carried out in three steps. First, because measurement invariance is an important requirement for longitudinal analyses, we constructed latent self-esteem measurement models and tested for measurement invariance. Second, to model longitudinal change, we constructed latent change score models, based on latent self-esteem factors. Third, to examine potential sources of self-esteem, we regressed initial level and change of self-esteem, as measured by change score models, on potential predictors of self-esteem.

**Measurement invariance.** To test for measurement invariance, we constructed self-esteem measurement models. More specifically, based on the 10 self-esteem items, three parcels were constructed that were used as indicators for a latent self-esteem factor for T1 and T2, respectively. Reducing indicators through parceling has been recommended as an approach that provides superior tests of structural model parameters because the constructs are defined more precisely (Little, 2013; Little, Rhemtulla, Gibson, & Schoemann, 2013). Because four of the indicators were assessed by telephone, these four items were used to construct one parcel. The other six items were randomly assigned to one of two additional parcels, consisting thus of three items each. Parcels were constructed in an identical manner at T1 and T2.

We conducted confirmatory factor analyses to test for measurement invariance across time points. We first tested for configural invariance following Widaman, Ferrer, and Conger

(2010) by constructing latent factors based on the three parcels for each wave, and factors were modeled to correlate across time points. Error variances from identical parcels created at different time points were allowed to correlate. Model fit was evaluated by inspecting  $\chi^2$  statistics, CFI, TLI, and RMSEA. Following good practice, CFI and TLI values of .95 or greater and RMSEA values of .06 or lower were considered as indicating good fit (Hu & Bentler, 1999). For a graphical representation of the model, see Figure 1A. The fit for this model was adequate (see Table 1). Next, we tested for weak invariance by comparing the basic configural invariant model with a model in which factor loadings were forced to be equal across time points. Finally, strong invariance was tested by additionally constraining intercepts of the parcels to be equal across time. All models yielded adequate model fit (see Table 2).

Differences in model fit were tested by  $\chi^2$  differences tests. Results showed no statistically significant difference in fit between the configural invariant and the weak invariant model ( $\Delta\chi^2 [2] = 4.61; p < .05$ ), whereas a significantly worsened fit was obtained when comparing the weak invariant model with the strong invariant model ( $\Delta\chi^2 [3] = 29.03; p > .05$ ). However, because  $\chi^2$  values depend on sample size and a large sample was used in this analysis ( $N > 5,000$ ), even minor differences between time points may have yielded statistically significant differences. We therefore assessed changes in model fit by the test of a small difference in fit (MacCallum, Browne, & Cai, 2006); this showed the model fit to be not significantly worse for the weak invariant or the strong invariant model. The test thus supported the self-esteem measure to be invariant between T1 and T2.

**Latent change score models.** After establishing time invariance in self-esteem, we constructed latent change score models based on the latent self-esteem factors at T1 and T2 with strong invariance. The models were estimated to provide an indication of mean-level change in self-esteem from T1 to T2 (see McArdle, 2009). The first latent self-esteem factor was scaled

according to Ferrer, Baluerka, and Widaman's (2008) suggestion to establish an approximate standard metric, such that the variance of the latent self-esteem factor at T1 was set to 1, and the mean of the factor was set to 0. Change and initial values of self-esteem could thus be interpreted in terms of a standardized metric with a mean of 0 and a standard deviation of 1 relative to self-esteem at T1. As proposed by McArdle (2009) and Selig and Preacher (2009), the latent change score in this model was controlled for the intercept or level of self-esteem. Controlling change for the initial value of self-esteem provides an estimate of change that is not confounded by initial mean-level differences in self-esteem. By adjusting for initial values of self-esteem, we were able to accommodate that associations between potential predictors of change in self-esteem were not an artifact of a correlation between initial value and change in self-esteem (see von Soest & Hagtvet, 2011, for a detailed discussion of this issue).

**Predictors of self-esteem.** Next, level and change in self-esteem were regressed on predictors. In a first model, only gender, age, and polynomials of age were included as predictors, to examine age trends and gender-specific trends for self-esteem. For our analyses, age was divided by 10, so as to express the rate of change by decade and centered at age 60, near the average age of the sample.

Finally, to examine potential sources of self-esteem, all potential predictor variables were included simultaneously as predictors of initial level and change in self-esteem, together with age, its polynomials, and gender. All continuous predictor variables except age were mean centered, whereas all dichotomous variables were effect coded. We used a weighted effect coding scheme, such that the effect indicators were mean centered (see Cohen, Cohen, West, & Aiken, 2003). For the variables unemployment and sick leave, persons who already had retired at T1 were scored 0 (the mean score), because sick leave and unemployment are not applicable to retired individuals. As a consequence, parameter estimates refer to age 60 and indicate sample

averages (across all individuals) and the extent of differences associated with a particular variable (rather than for a particular group).

We also tested for interaction effects of gender and age by including interaction terms as predictors of initial level and change. Only interaction terms that showed significant associations with initial level or slope of self-esteem were kept in the final model.

### **Results**

Table 2 presents descriptive statistics and intercorrelations of all variables included in the study. At both T1 and T2, self-esteem scores were substantially higher than the midpoint of the scale (i.e., larger than 3), thereby showing that on average participants reported rather high self-esteem. The correlation of  $r = .61$  between the two measurement points of self-esteem indicated considerable rank-order stability of self-esteem across five years between the two data collection waves. Correlations between self-esteem and register data were generally small, whereas personality variables correlated more strongly with self-esteem, with the strongest correlations being with emotional stability.

#### **Self-Esteem and Self-Esteem Development Across the Second Half of Life**

To examine change in self-esteem, change score models based on the latent self-esteem factors at T1 and T2 were estimated, as Figure 1B depicts. The fit for this model was good ( $\chi^2[9] = 67.76$ , CFI = .99, TLI = .99, RMSEA = .034). As defined by the model, the mean of the level of self-esteem at T1 was 0, with a standard deviation (*SD*) of 1. The mean change of self-esteem from T1 to T2 was estimated to .06 ( $p < .001$ ;  $SD = .32$ ,  $p < .001$ ), indicating that self-esteem scores on average increased by .06 standard deviations between T1 and T2 when considering the entire sample.

Next, we estimated how age and gender predicted both initial status of self-esteem at T1 and change in self-esteem from T1 to T2. For this purpose, initial level of self-esteem and latent

change scores for self-esteem were regressed on age and gender. Moreover, quadratic and cubic terms for age were included to examine potential non-linear age trends (see Figure 1C). Also for this model, fit was adequate ( $\chi^2[25] = 247.08$ , CFI = .98, TLI = .96, RMSEA = .040).

As Table 3 shows (Model 1), when age and gender were included in the regression analysis, we found that age, age<sup>2</sup>, and gender predicted significantly the initial status of self-esteem. Men had significantly higher self-esteem, and level of self-esteem changed non-linearly with age. Figure 2A shows that self-esteem levels peaked at about age 50 and declined gradually thereafter. The size of the reduction in self-esteem from the peak of self-esteem at age 50 to the estimated mean level of age 80 was  $d = 0.51$ , thereby indicating that self-esteem declined on average about half a standard deviation between ages 50 and 80. When predicting changes in self-esteem, age<sup>2</sup> and age<sup>3</sup> were significant predictors, whereas the linear components of age and gender were not (see Table 3). The significant adjusted mean of the change score of .07 ( $p < .01$ ) indicated that the estimated self-esteem score increased with .07 standard deviations in the five years between T1 and T2 for those who were 60 years of age at T1. However, as Figure 2B shows, change differed across age, with increases in self-esteem in the youngest age group, when self-esteem increased with  $d = 0.21$  between T1 and T2 for people aged 40. Mean levels of self-esteem remained rather stable between ages 50 and 70, with a mean change close to 0, whereas declines in self-esteem between T1 and T2 from about age 70 onwards were observed, with a considerable decline in self-esteem of  $d = .50$  from age 80 (T1) to age 85 (T2). We conducted additional analyses in which an age  $\times$  gender interaction term was included as predictor. However, no significant interactions were found for self-esteem level and change ( $p > .05$ ), indicating that the age trends in self-esteem level and change did not vary according to gender and that the initial gender differences thus remained constant.

### **Predictors of Level and Change in Self-Esteem**

In a final set of analyses, we additionally included all potential predictor variables simultaneously into our models. Table 3 shows the results of these analyses (Model 2). Concerning measures of SES, results showed that education, income, and unemployment were all significantly related to the initial level of self-esteem, indicating that higher SES was associated with higher self-esteem. None of the SES indicators showed significant associations with change in self-esteem. In a similar vein, none of the tested interaction effects of SES with age and gender were significant.

As an indicator of health problems, having received a disability pension was significantly related to both lower levels of and smaller increases in self-esteem, compared to having never received a disability pension. The association with the level of self-esteem was qualified by a significant interaction effect with age. As Figure 3 shows, relative to people without disability, those with disability pensions reported lower self-esteem in midlife, but not in old age. No association of sick leave with self-esteem was found.

As an indicator of social relationships, having a cohabitating partner was related to both a higher level of self-esteem and a stronger increase in self-esteem, as compared to people without a live-in partner. This effect was not moderated by age or gender. A history of divorce or widowhood was not related to either level or change in self-esteem.

As indicators of personality, high scores on extraversion, conscientiousness, and openness were each related to higher levels of self-esteem, but no such relation was found for agreeableness. In addition, a significant gender  $\times$  openness interaction emerged. As Figure 4 shows, more open participants reported higher levels of self-esteem, but openness made a greater difference for self-esteem among men than among women. None of the four personality traits were related to changes in self-esteem.

Emotional stability evinced an even more complex pattern of associations with self-esteem. First, we observed significant associations between emotional stability and self-esteem level and significant interactions with age and gender. As Figure 5 shows, emotionally stable participants reported higher self-esteem, but the differences in level of self-esteem between persons high and low in emotional stability were more pronounced in midlife than in old age and more pronounced in women than men. Second, emotional stability was also significantly associated with changes in self-esteem. Emotional stability also interacted with age, indicating that the rate of change in self-esteem was more positive (i.e., less of a decrease, if not an increase in self-esteem) among the emotionally stable in midlife, but differences by emotional stability disappeared with increasing age.

### **Discussion**

In this study, we applied latent change score models to two-wave longitudinal self-esteem data obtained as part of the population-based NorLAG study in Norway and examined the role of self-report and registry-based predictors. Results revealed that self-esteem peaked at around age 50 and declined thereafter, particularly among those aged 70 and older. Most important for our questions, lower SES, not having a cohabitating partner, and lifetime experiences of unemployment and disability were each uniquely associated with a lower self-esteem level and/or steeper self-esteem declines over the five-year study period. Over and above the registry-based information, personality characteristics were also found to be relevant, with high levels of emotional stability, extraversion, conscientiousness, and openness each being related to higher levels of self-esteem. Emotionally stable participants also showed less pronounced declines in self-esteem. Finally, we found that associations of self-esteem level with disability and emotional stability were weaker with advancing age. Gender interactions indicated that emotional stability was more strongly associated with self-esteem level among women than men, whereas openness

was more strongly associated with self-esteem level among men. Our discussion will consider how the findings demonstrate the utility of registry-based information and suggest that physical health, social relationships, and personality factors are in manifold ways uniquely associated with self-esteem and its development later in life.

### **Self-Esteem and Self-Esteem Development Across the Second Half of Life**

Age trends of self-esteem as found in this study are in accordance with trends found in several longitudinal studies showing a peak of self-esteem in midlife, at around age 50, and then a decrease in old age (Orth & Robins, 2014). Moreover, our study indicates considerable declines in self-esteem in old age, as we have observed a rather large reduction in the level of self-esteem of about half a standard deviation from age 50 to age 80, as well as accelerating longitudinal reductions in self-esteem particularly from age 70 and thereon. Our results are thus in line with studies reporting rather strong declines in self-esteem in old age (Orth et al., 2012; Orth et al., 2010). However, we note that the empirical literature is divided, as other studies have reported considerably smaller mean-level declines in self-esteem in old age (Orth et al., 2015; Wagner, Gerstorf, et al., 2013; Wagner et al., 2014). According to Orth et al. (2015), the diversity of the findings may be explained by cross-cultural differences, because studies reporting large drops in self-esteem primarily stem from the United States (Orth et al., 2012; Orth et al., 2010), and studies reporting minor decreases used samples from Germany (Orth et al., 2015; Wagner et al., 2014) or Australia (Wagner, Gerstorf, et al., 2013). However, there are considerable similarities in cultural values and health care systems between a Northern European country such as Norway and Germany. The greater decreases in self-esteem in old age in our study compared to German samples may therefore not be easily explained by cultural differences. The nature and causes of differential trajectories of self-esteem in old age should be examined in greater detail in future studies.



### **Predictors of Level and Change in Self-Esteem**

**Socioeconomic status.** Extending earlier reports that made use of self-reported SES, our study utilized registry-based information on key SES indicators: education, income, and unemployment. The results of our study are largely in accordance with previous research: High SES was consistently associated with high levels of self-esteem, as was reported in meta-analytic studies (Twenge & Campbell, 2002). Moreover, SES did not predict changes in self-esteem in our study, which is again in line with results from previous prospective research (Orth et al., 2012; Orth et al., 2010; Wagner et al., 2014).

The temporal ordering of associations between SES and self-esteem remains unclear, however: Even though the literature in the field typically proposes that SES is an antecedent of self-esteem, it may also be possible that high self-esteem influences SES (Twenge & Campbell, 2002). Because the size of associations between SES and self-esteem is small, studies examining the mechanisms through which SES is related to self-esteem may be underpowered, even though large samples were used both in our study and in other longitudinal studies examining prospective SES–self-esteem associations.

**Physical health.** Concerning physical health, a history of receiving a disability pension was related to both the level of and changes in self-esteem, thereby supporting findings from a recent longitudinal study reporting that moderate to severe physical health conditions as diagnosed by physicians predicted stronger decreases in self-esteem in late life (Wagner, Hoppmann, et al., 2015). In our study, recent sick leaves were not related to either the level of or change in self-esteem. This may indicate that short-term variations in physical health, which are typically measured by recent histories of sick leaves, are not associated with self-esteem, whereas far-reaching, long-term health conditions, which are typically indicated by receiving disability pensions, in fact show associations with poor self-esteem.

**Social relationships.** Our results extend earlier reports on the relevance of social factors that have primarily drawn from samples in early adulthood to midlife and old age. Our study indicates the importance of having a cohabitating partner in middle and late adulthood. A cohabitating partner was associated with both higher levels of and more favorable changes in self-esteem. Of interest is that a history of divorce and widowhood was not associated with self-esteem over and above current partner status. One way to interpret the finding is that current relationship status is of greater importance than people's dissolution history. This interpretation is in accordance with empirical studies reporting that relationship dissolution is indeed followed by a period of pragmatic, physical, and emotional problems; however, the problems typically subside eventually, as persons often make significant adjustments to their new life circumstances (Chase-Lansdale & Hetherington, 1990). In the long run, then, current relationship status may be of greater importance for one's own self-esteem than people's histories of relationship dissolutions.

**Personality.** All personality traits except agreeableness showed associations with level of self-esteem. In particular, high levels of self-esteem were associated with a mature personality profile consisting of high scores on emotional stability, conscientiousness, and extraversion, which provide individuals with adequate capacities to be productive and involved contributors to society (Caspi, Roberts, & Shiner, 2005). This pattern is in accordance with other studies showing associations between personality and levels of self-esteem (Erol & Orth, 2011; Robins et al., 2001; Wagner et al., 2014).

As to predicting changes in self-esteem, only emotional stability showed significant associations; this diverges somewhat from previous studies in which all Big Five traits were related to changes in self-esteem (Wagner, Lütke, et al., 2013). The conflicting results may be due to different analytical approaches, because we included all personality traits simultaneously

as predictors of self-esteem to assess their unique predictive capabilities, whereas Wagner et al. (2013) examined personality–self-esteem associations for each trait separately. We also note that all earlier reports examined adolescents and young adults, whereas our study assessed personality–self-esteem associations in the second half of life. Because our study found age differences in associations between emotional stability and changes in self-esteem, prospective associations between these two variables may be specific to particular age periods.

Our study provides novel information that could inform theoretical perspectives on sources of self-esteem. By and large, our results on predictors of level of self-esteem are in accordance with expectations from both the intrapersonal and the interpersonal perspective, in that we found unique associations of all broad factors of SES, physical health, social relationships, and most personality traits with levels of self-esteem.

The results are less conclusive with respect to associations with changes in self-esteem. Overall, fewer associations with changes in self-esteem were found, yet there is some further support for the interpersonal perspective based on the findings of partnership status. This relationship shows the importance of long-term, close relationships for self-esteem development across middle and late adulthood. Associations of emotional stability with changes in self-esteem provide additional support for this perspective, being in line with notions suggesting that high emotional stability desensitizes people to being affected by signs of social exclusion (Denissen & Penke, 2008). The finding is also in accordance with the intrapersonal perspective, because high emotional stability probably makes persons also less vulnerable to other negative experiences and losses that accompany later life. Finally, a history of having received a disability pension was also associated with changes in self-esteem. Physical health problems may hinder individuals from living up to their own expectations in important domains of life and may increase the risk of social marginalization. Accordingly, this finding could support both the intrapersonal and

interpersonal perspectives. However, the lack of associations of self-esteem change with a more comprehensive set of potential predictors – including indicators of SES – appears to limit the explanatory value of both perspectives, and particularly the intrapersonal perspective.

### **The Role of Age and Gender**

Two cross-sectional interactions with age emerged, in that associations of self-esteem level with disability and emotional stability were reduced with advancing age. These reductions are in accordance with a resource perspective (Baltes et al., 2006). Older adults may have better chances to maintain self-esteem if they are capable of increasingly dissociating themselves from resources that typically decrease in old age, such as physical health (Wagner et al., 2014). The age interaction effects are also in accordance with a recent study reporting similar decreases of associations of emotional stability and subjective health with self-esteem in older age (Wagner et al., 2014). An intriguing aspect of our findings is that associations between emotional stability and change in self-esteem also decreased in size with increasing age. This finding supports the notion that aspects of emotional stability may be less likely to affect the evaluation of the self among old adults.

Gender interactions were limited to personality traits, and our results are largely in agreement with previous findings from Robins et al. (2001). We also found a gender stereotypic pattern, with openness being more strongly correlated with self-esteem level among men and emotional stability being more strongly correlated with self-esteem level among women in cross-sectional analyses. Contrary to our expectations, we did not find significant gender interactions with social relationship variables. Even though research indicates that being single or divorced is more detrimental for men's psychosocial adjustment than for women's (Cooney & Dunne, 2001), single, divorced, and widowed men may experience fewer financial problems than their female counterparts, which in turn may counteract potential gender differences.

### **Limitations and Outlook**

With this study, we were in the unique position to utilize long-term longitudinal data from a relatively large population-representative national sample, making use of the extensively used Rosenberg Self-Esteem Scale, and linking self-report data with information obtained from registry records. At the same time, we acknowledge several limitations of our measures, study design, and sample. Concerning limitations in measures, we measured Big Five personality traits with an instrument that has been used in Norway only, and some of the personality traits measured had somewhat low reliability. Even though the scale has been shown to have good validity (Engvik, 1993) and reliability is comparable to other Big Five scales with a similar number of items (Donnellan et al., 2006), a more widely used instrument assessing the Big Five personality traits would have been an advantage so as to compare findings directly with reports from other studies. Moreover, factors not assessed in the present study could provide additional theoretical insights. For example, the intrapersonal perspective emphasizes that people's own perception of their performance is an important source of self-esteem. However, this study only assessed outcomes that are typically desirable in our society but did not assess how individuals themselves evaluate their performance or their perceptions of the importance of their performance in different areas. In future research, it may also be feasible to use registry-based information about the end of life, so as to examine more thoroughly how self-esteem changes in the last years of life and what role presumably relevant factors, such as place of death and cause of death, play (for an overview, see Gerstorf & Ram, 2013). We also note that it would be highly intriguing to examine whether our findings regarding self-esteem change and predictors thereof would also generalize to rank-order stability. For example, self-esteem may fluctuate more among emotionally unstable than among stable individuals, because self-esteem may be determined to a larger degree by external stressors among persons with emotional instability.

Predictors of rank-order stability of self-esteem should thus be examined more closely in future studies.

Second, as limitations of our study design, predictors of self-esteem were assessed at one time point only; as a consequence, longitudinal analyses were limited to examining how predictors at the first time point were associated with change in self-esteem, whereas it was not possible to examine how changes in predictors were related to changes in self-esteem. For example, it was not possible to examine how changes in indicators of SES – such as income and unemployment – were related to changes in self-esteem, even though such analyses would provide valuable information about the longitudinal association of these two concepts. Moreover, we note that the size and strengths of associations found for the socioeconomic, physical health, social relationships, and personality factors reported here may be specific to the five-year time scale. It is quite possible that the relevance of these variables is different or that other factors may emerge to be important when associations are considered over shorter time intervals, such as fluctuations from one situation to the next or one day to the next (Gerstorff, Hoppmann, & Ram, 2014). For example, although in our study sick leaves were not related to changes in self-esteem over a long time span such as five years, it is quite possible that shorter-term sick leaves may predict temporary reductions in self-esteem. Our study design is also limited in that only two waves of data were available. As a result, it was not possible, for example, to examine complex longitudinal change patterns (e.g., non-linear change) in how self-esteem develops across the second half of life.

As limitations of the sample, selective participation may have biased our results, because no institutionalized older adults were included in the sample and persons with low educational status were underrepresented. Likewise, we acknowledge selective attrition as another limitation, even though we used contemporary missing data routines to reduce the impact of selective

attrition on the results. It remains to be seen whether the findings obtained here generalize to less positively select segments of the general population. For example, it is possible that emotional stability is particularly important for self-esteem under the challenging living conditions of population segments with low SES. As another sample limitation, the nature and correlates of change in self-esteem may have been shaped by the specific historical time monitored. Although research has shown that such cohort differences in levels and rates of change in self-esteem appear negligible (see Orth & Robins, 2014), it will also be intriguing to see what happens with self-esteem trajectories when its presumed antecedents and correlates change historically (e.g., better cognitive performance and psychosocial functioning among 75-year-olds nowadays than among same-aged peers two decades ago: Gerstorf et al., 2015).

### **Conclusions**

In conclusion, this study provides novel information on registry and self-report predictors of self-esteem level and change in the second half of life. The study provides some support for both intrapersonal and interpersonal perspectives; the associations of self-esteem levels found are by and large in agreement with both theoretical frameworks. However, results concerning predictors of self-esteem change provided more mixed support. Only partnership status, emotional stability, and receiving a disability pension were predictors of self-esteem change, whereas other factors did not show associations. This study thus indicates that both perspectives may be of some importance for self-esteem development in middle and late adulthood; however, the role of these perspectives may be limited to certain life domains.

Future longitudinal studies corroborating findings from this study are needed. The reduced associations with self-esteem in old age observed for health variables and emotional stability/neuroticism also deserve future research attention: Knowledge about mechanisms that are at play in these reduced associations may inform intervention studies that aim to boost self-

esteem in vulnerable groups by dissociating people's own self-evaluations from biopsychosocial characteristics, such as poor physical health or low social status.



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Table 1.

*Fit Indices for Measurement Models with Increasing Degree of Invariance Across Time*

	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA	90% CI RMSEA
Configural invariance	50.72	5	1.00	.98	.041	.031 – .051
Weak invariance	55.33	7	.99	.99	.035	.027 – .044
Strong invariance	84.36	10	.99	.99	.037	.030 – .044

*Note.*  $N = 5,555$ . *df* = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation. 90 % CI RMSEA = 90 % confidence interval of RMSEA.

Table 2.  
*Descriptive Statistics for the Variables Under Study*

Parameter	<i>M</i>	<i>SD</i>	<i>N</i>	Intercorrelations															
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Self-esteem (range 1-5)</b>																			
(1) Self-esteem T1*	4.08	0.61	5,554																
(2) Self-esteem T2*	4.14	0.59	3,554	.61															
<b>Socio-demographics</b>																			
(3) Age (range 40–80)	57.91	11.11	5,555	-.10	-.11														
(4) % women	51.4		5,555	-.09	-.08	-.01													
<b>Register data</b>																			
(5) Education (in years)	11.62	2.76	5,508	.11	.09	.01	-.07												
(6) Income	293.53	269.67	5,555	.16	.13	.01	-.27	.38											
(7) % unemployment	6.7		4,101	-.07	-.06	-.06	-.02	-.07	-.10										
(8) % sick leave	19.5		4,101	-.01	-.01	-.03	.01	-.07	-.02	.03									
(9) % history disability	15.4		5,555	-.12	-.12	.02	.07	-.18	-.22	-.03	-.08								
(10) % cohabitating partner	70.4		5,514	.09	.10	-.16	-.14	.02	-.01	-.10	.00	-.04							
(11) % history divorce	24.4		3,562	.03	.02	-.07	.04	.01	.04	.06	.02	.08	-.32						
(12) % history widowhood	4.0		3,559	-.08	-.07	.35	.13	-.06	.04	-.01	-.02	-.04	-.39	-.09					
<b>Personality (range 1-7)</b>																			
(13) Emotional stability	4.77	1.26	4,100	.49	.40	-.02	-.15	.01	.09	-.03	-.04	-.10	.06	-.01	-.01				
(14) Extraversion	4.87	1.17	4,107	.32	.28	-.03	.12	-.01	.01	-.06	.00	.02	.01	.03	.01	.28			
(15) Conscientiousness	5.02	1.01	4,093	.27	.22	-.02	.04	.08	.10	-.06	-.01	-.05	.03	.01	.01	.22	.25		
(16) Agreeableness	5.65	0.94	4,109	.17	.17	.01	.23	-.06	-.11	-.03	.01	.05	-.05	.03	.08	.21	.40	.32	
(17) Openness	4.87	0.87	4,096	.27	.23	-.04	-.01	-.01	.03	-.02	-.01	.04	.02	.04	-.01	.26	.36	.32	.36

*Note.* Intercorrelations of  $r = |.06|$  or above are statistically significantly different from zero at  $p < .001$ . Continuous measures are presented in their original metric.  $N$  = number of participants. Income in 1,000 Norwegian kroner (NOK). \*Descriptive statistics of self-esteem scores are based on mean scores of all 10 items of the Rosenberg Self-Esteem Scale. However, all analyses in this paper are based on latent self-esteem scores.

Table 3.

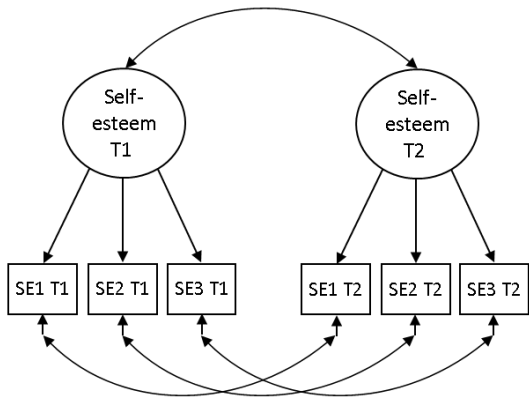
*Standardized Beta Coefficients from Regression Analyses Predicting Initial Status and Subsequent Change in Self-Esteem*

Parameter	Model 1 Age and gender included		Model 2 All predictors included	
	Initial status	Change	Initial status	Change
Intercepts (adjusted means)	.00	.07***	.00	.08**
<b>Socio-demographic variables</b>				
Age	-.21***	.09	-.14***	.11
Age <sup>2</sup>	-.05***	-.11*	-.03	-.15**
Age <sup>3</sup>	.06	-.27**	.06	-.33***
Female gender	-.10***	.01	-.02	.02
<b>Register data</b>				
Education			.10***	.05
Income			.08***	.02
Unemployment			-.03*	.01
Sick leave			-.01	-.01
Disability			-.06***	-.06*
Disability × age			.04**	–
Cohabiting partner			.04*	.06*
History of divorce			.03	.01
History of widowhood			-.04	.01
<b>Personality</b>				
Extraversion			.17***	.05
Openness			.11***	.04
Openness × gender			-.04*	–
Conscientiousness			.12***	.03
Agreeableness			-.01	.04
Emotional stability			.37***	.09*
Emotional stability × age			-.06***	-.07*
Emotional stability × gender			.06***	–

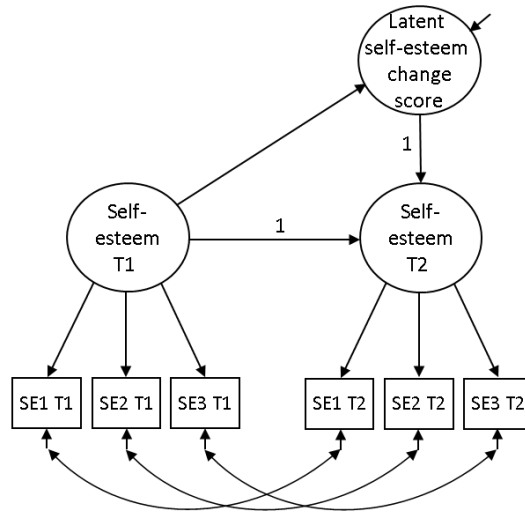
*Note.* Included were all participants with valid self-esteem data at T1 ( $N = 5,555$ ).

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

A. Basic Model



B. Unconditional Latent Change Score Model



C. Conditional Latent Change Score Model

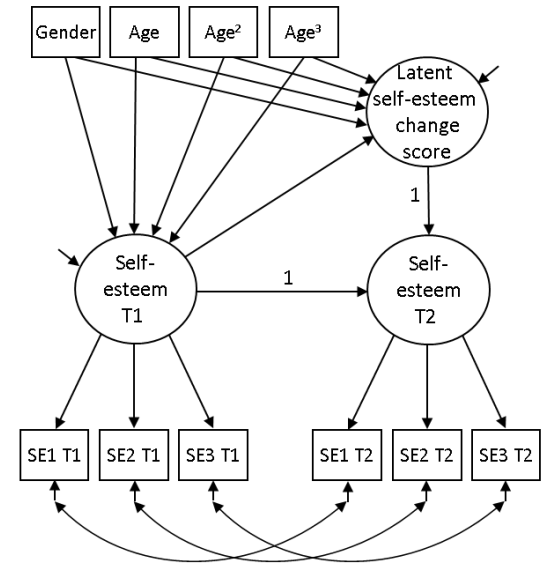


Figure 1. Latent difference score models for self-esteem as estimated in this study.

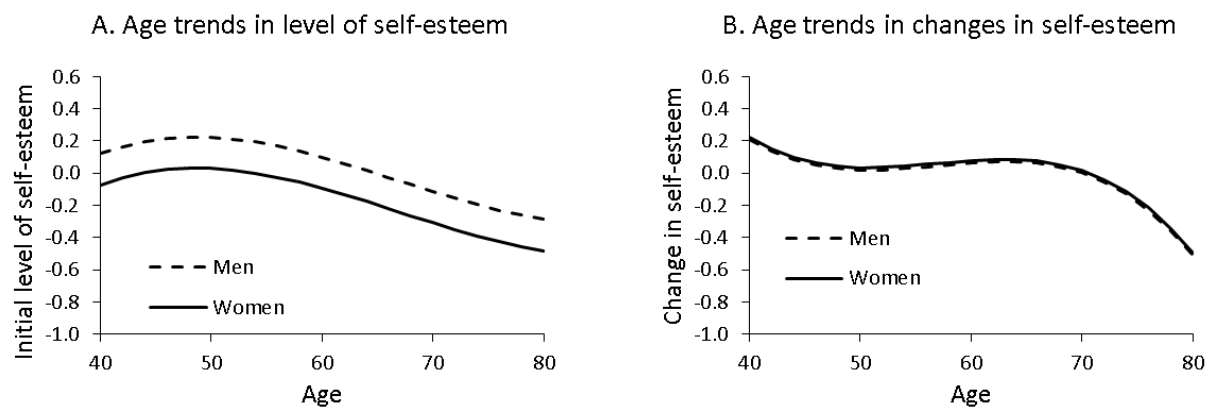
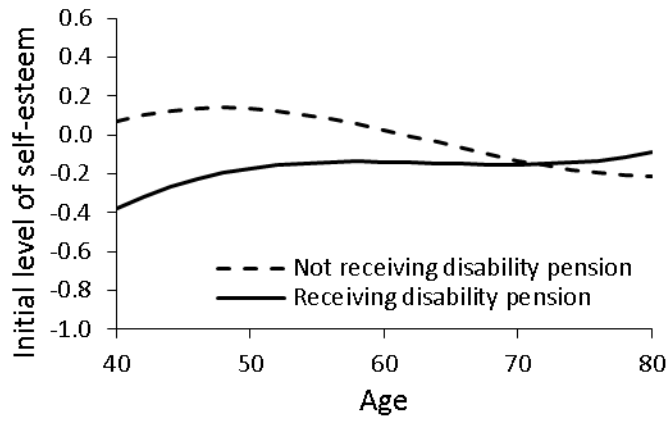
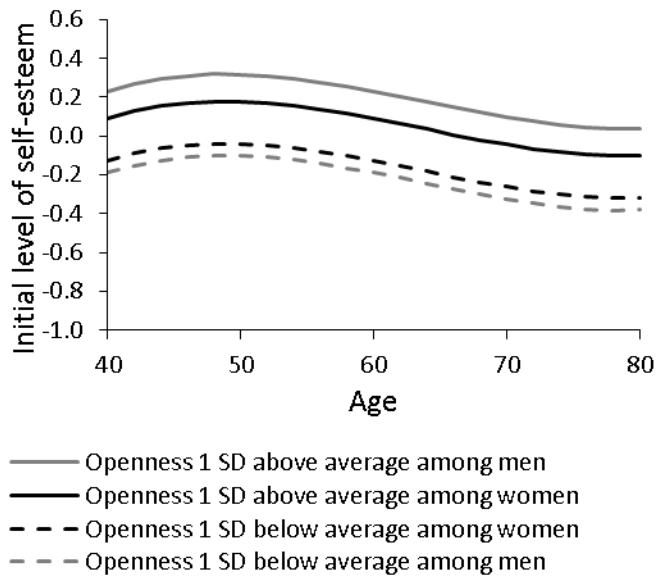


Figure 2. Initial level of self-esteem (A) and change in self-esteem (B) by age and gender.

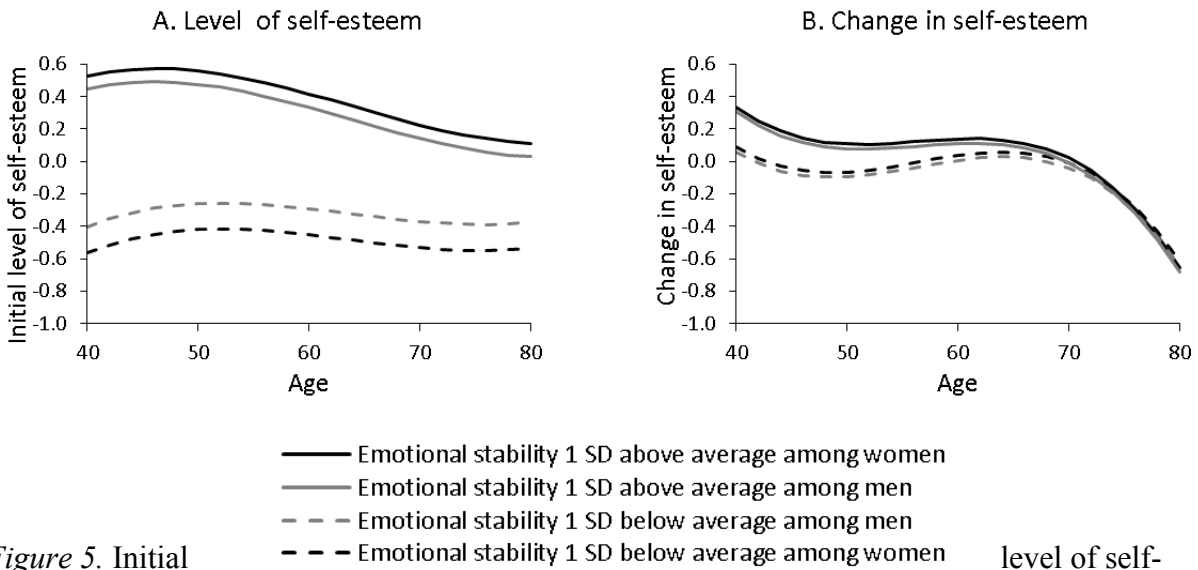
Standardized scores of self-esteem (z scores) are presented. Self-esteem peaked at around age 50 and declined thereafter, particularly among those aged 70 and older. Men reported higher self-esteem by about 0.19 SD, but men and women changed in parallel. Gender differences thus remained constant.



*Figure 3.* Initial level of self-esteem (z scores) for people with and without a history of receiving a disability pension. Relative to people without disability, those with disability pensions reported lower self-esteem in midlife, but not in old age.



*Figure 4.* Initial level of self-esteem (z scores) by gender and openness. More open participants reported higher self-esteem, but openness made a greater difference for self-esteem among men than among women.



*Figure 5.* Initial level of self-esteem (A) and change in self-esteem (B) by gender and emotional stability. Standardized scores of self-esteem (z scores) are presented. Emotionally stable participants reported higher self-esteem, but differences in level of self-esteem between persons high and low in emotional stability were more pronounced in midlife than in old age and more pronounced in women than in men. Emotional stability also interacted with age, indicating that the rate of change in self-esteem was more positive (i.e., less of a decrease, if not an increase in self-esteem) among the emotionally stable in midlife, but differences by emotional stability disappeared with increasing age.