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The Development of Global and Domain-Specific Self-Esteem From Age 13 to 31

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Abstract

This study examines the development of global self-esteem and self-esteem in six specific domains across adolescence and young adulthood. Using a cohort-sequential design, we analyzed longitudinal data on 3,116 Norwegian men and women from 13 to 31 years of age by means of growth curve modeling. Questionnaire data provided information on global self-esteem and self-esteem in social, academic, athletic, and appearance domains. Data on important life outcomes was provided by register linkages. Results showed increasing levels of global self-esteem and self-esteem in most domains with increasing age. Being male, higher parental education, and reported higher levels of parental care were related to higher levels of global self-esteem and self-esteem in several domains. Self-esteem in the appearance domain showed high and stable correlations with global self-esteem, whereas in social domains, correlations with global self-esteem increased over age, with a particularly steep increase for romantic appeal self-esteem. As to the prospective relationship between self-esteem and important life outcomes, results showed that participants high in academic self-esteem attained higher education levels and higher income, but most of the relationship was explained by covariates such as parents' socioeconomic status and school grades. Low global self-esteem predicted later prescription of antidepressants, even after controlling for covariates. This study is the first to provide a comprehensive picture of the development of global and domain-specific self-esteem throughout adolescence and young adulthood using long-term longitudinal data. The results underscore the importance of examining development of self-esteem in specific domains in addition to global self-esteem.

Keywords: Self-esteem, self-concept, domains, development, adolescence

The Development of Global and Domain-Specific Self-Esteem From Age 13 to 31

Global self-esteem is generally conceptualized as the individual's general attitude towards, or evaluation of, the self, and it reflects people's beliefs about how worthy they are as persons and if they merit respect (Blascovich & Tomaka, 1991; Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). Global self-esteem is thus seen as the central evaluative component of the self and is regarded a fundamental psychological construct. Not surprisingly then, global self-esteem has received comprehensive attention in psychological research (Leary & Baumeister, 2000; Wagner, Ludtke, Jonkmann, & Trautwein, 2013). In recent years, research on self-esteem has particularly advanced through the utilization of large-scale longitudinal data to examine the developmental aspects of self-esteem across the life span (e.g., Erol & Orth, 2011; Orth, Robins, & Widaman, 2012; Orth, Trzesniewski, & Robins, 2010; Shaw, Liang, & Krause, 2010; Wagner, Gerstorf, Hoppmann, & Luszcz, 2013; Wagner, Ludtke, et al., 2013).

However, global self-esteem is also commonly conceptualized as the sum of domain-specific self-concepts (e.g., physical self-esteem, academic self-esteem; Marsh & Shavelson, 1985). Considerably less attention has been directed towards the development of domain-specific self-concepts and their importance for global self-esteem. We concur with several researchers who contend that global self-esteem cannot be adequately understood if only its global component is considered and domain-specific facets of self-esteem are not taken into account (Harter, 2012; Marsh, Parada, & Ayotte, 2004; Marsh & Shavelson, 1985; Rosenberg et al., 1995). Finally, although some advances have been made (Trzesniewski et al., 2006), the long-term psychosocial consequences of having low versus high domain-specific self-esteem has received little attention.

Given these lacunas in our understanding of the development, sources, and outcome of self-esteem, this study aims to advance our understanding of self-esteem by examining: (1) the

development of global and domain-specific self-esteem, (2) developmental differences according to sociodemographic and parental factors, (3) the interrelationship between global self-esteem and self-esteem in specific domains, and (4) the prospective relationship between trajectories of global and domain specific self-esteem and important life outcomes. By using a cohort-sequential design, we cover self-esteem development in adolescence and young adulthood (ages 13 to 31), which are considered to be periods with several demographic and subjective challenges (Arnett, 2000; Galambos, Barker, & Krahn, 2006). To the best of our knowledge, no population-based longitudinal study has examined the development of both global and domain-specific self-esteem covering both adolescent and young adult years. This study will thus provide novel information about domain-specific and global aspects of self-esteem, their interplay during these formative years, and their prospective associations with important life outcomes.

Theoretical Perspectives on Self-Esteem

Global and domain-specific aspects of self-esteem have primarily been conceptualized by using one of two broad and complementary theoretical perspectives, *intrapersonal* or *interpersonal*: The intrapersonal perspective, as originally proposed by William James (1890), theorizes that global self-esteem is based on people's own perceptions of how adequately they perform in domains where they consider success to be important. In accordance with the intrapersonal perspective, theories have posited self-esteem to be hierarchical and multifaceted, involving emotional, social, physical, and academic components that influence global self-esteem (Fleming & Courtney, 1984; Marsh et al., 2004; Shavelson, Hubner, & Stanton, 1976). Global self-esteem thus depends on secondary constructs of self-esteem in several specific domains. The intrapersonal perspective therefore provides an account of how global and domain-specific aspects of self-esteem are interconnected, and it claims that the nature of global self-esteem cannot be completely understood without considering domain-specific aspects of self-esteem.

The interpersonal perspective emphasizes the social nature of self-esteem. Dating back to Cooley's (1902) and Mead's (1934) notions in the framework of symbolic interactionism, this perspective largely considers global self-esteem to be a result of internalizations of others' perceptions and evaluations of oneself. Modern variants of the interpersonal approach include the sociometer model of self-esteem (Leary, Tambor, Terdal, & Downs, 1995), according to which the major function of global self-esteem is to identify threats of social exclusion. The interpersonal perspective on self-esteem predicts that global self-esteem is primarily influenced by self-evaluations that are important for the individual's social status; self-esteem in domains of social relevance may therefore be central in determining global self-esteem (Gentile et al., 2009; MacDonald, Saltzman, & Leary, 2003). The two perspectives delineated here will be used as a basis for predictions concerning developmental aspects of global and domain-specific self-esteem.

Development of Global and Domain-Specific Self-Esteem Across Adolescence and Young Adulthood

A large number of studies have examined the development of global self-esteem across age. Regarding adolescence, longitudinal studies provide support for the notion of increasing levels of global self-esteem from middle adolescence onwards (Erol & Orth, 2011; O'Malley & Bachman, 1983; Steiger, Allemand, Robins, & Fend, 2014). Similar results have been obtained concerning developmental trends in emerging and young adulthood, where several longitudinal studies reported increasing levels of global self-esteem from about age 18 into middle adulthood (Erol & Orth, 2011; Galambos et al., 2006; Orth et al., 2012; Shaw et al., 2010; Wagner, Ludtke, et al., 2013). The maturity principle, originally proposed to explain age trends in personality (see Caspi, Roberts, & Shiner, 2005), has been used to account for the increasing trend in global self-esteem (Trzesniewski, Donnellan, & Robins, 2013). According to the principle, through adolescence and particularly young adulthood, people adapt more and more to social roles in

society, which leads them to become more emotionally stable, conscientious, confident, and capable (Trzesniewski et al., 2013). As a result of these positive developments in personality and adaptations to social roles, levels of global self-esteem are thought to improve through adolescence and young adulthood (Gove, Ortega, & Style, 1989).

The maturity principle may also be valuable in predicting the development of self-esteem in specific domains: As adolescents and young adults improve their capabilities and consolidate social roles in a variety of areas with increasing age, one would expect to find gradually improved self-esteem in most specific domains. Moreover, improvements may be the strongest in domains where important developmental tasks are accomplished successfully. One of the most important tasks, beginning in adolescence, is the formation of close and intimate relationships (Arnett, 2000). Self-esteem in social domains, and in particular individuals' self-evaluations of their abilities to establish romantic relationships, may thus improve particularly strongly.

Consistent with this prediction, longitudinal studies showed that self-esteem increased with age in adolescence in the domains of physical appearance and romantic appeal (Cole et al., 2001; Steiger et al., 2014; Young & Mroczek, 2003) – two domains that may be of particular importance in forming of intimate relationships. Findings concerning self-esteem in the academic and other social domains, such as social acceptance and close relationships, have been mixed, with some studies reporting stable and other increased levels with increasing age in adolescence (Cole et al., 2001; Steiger et al., 2014; Young & Mroczek, 2003). The only longitudinal study among young adults assessing domain-specific self-esteem (Donnellan, Trzesniewski, Conger, & Conger, 2007) found small increases in self-esteem concerning intimate relationships and sociability over a period of four years but observed no changes in other domains discussed here.

However, the studies conducted so far have had several limitations, as sample size was small (Young & Mroczek, 2003), relatively short age spans of four years were examined

(Donnellan et al., 2007; Steiger et al., 2014), or self-esteem was assessed in only few domains (Steiger et al., 2014). In conclusion, there is a need for more research examining developmental trends in domain-specific self-esteem, particularly in young adulthood. This would provide valuable information on potential maturity processes in domain-specific self-esteem.

Predictors of Self-Esteem Development

In addition to mean level changes in self-esteem in whole populations, the level and rate of change may differ according to important sociodemographic and contextual factors, such as gender, socioeconomic status (SES), and parental and familial background. Regarding gender, most studies have found higher mean levels of global self-esteem in men than in women in adolescence and young adulthood (see, e.g., McMullin & Cairney, 2004; Orth et al., 2010; Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002), even though also some non-findings concerning gender differences have been reported (Erol & Orth, 2011; Orth et al., 2012). Findings on potential gender differences in rates of development are to a larger degree mixed, with some studies reporting stable differences (Wagner, Ludtke, et al., 2013) and others reporting decreasing differences from adolescence to young adulthood (Galambos et al., 2006; Kling, Hyde, Showers, & Buswell, 1999). Independent of the specific changes in gender differences, these differences in both adolescence and young adulthood have been considered to be rather small in size (Orth et al., 2012).

However, it has been noted that gender effects in global self-concept may be a composite of counterbalancing gender differences in more specific domains, some favoring men and others women (Marsh, 1989; Marsh & Shavelson, 1985; Young & Mroczek, 2003). The rather small gender differences may thus mask substantial gender differences in rates and patterns of change in more specific self-esteem domains. As reported in a meta-analysis by Gentile and colleagues (2009), men had substantially higher scores on physical appearance and athletic competence self-

esteem, whereas no gender differences were found in the domains of academic competence and social acceptance. The only domain in which women had higher self-esteem scores was intimate relationships (Donnellan et al., 2007; Young & Mroczek, 2003). Differences in the shape of development were particularly observed for appearance self-esteem, with the greatest gender difference in early adolescence and gradual reductions through adolescence and emerging adulthood (Cole et al., 2001; Gentile et al., 2009). For other domains of self-esteem, stable gender differences over age or somewhat mixed findings concerning how rates of change differed according to gender were observed (Cole et al., 2001; Donnellan et al., 2007; Gentile et al., 2009; Steiger et al., 2014; Young & Mroczek, 2003). Diverging findings in different studies may mainly be due to the different age spans examined, where each study typically covered some few years of the adolescent or young adult period. Based on studies spanning the whole adolescent and young adult age, a more integrative picture of gender differences in the level and shape of domain-specific self-esteem trajectories may be drawn.

SES is another important variable that may influence global as well as domain specific self-esteem trajectories. According to the interpersonal perspective, social status and wealth may be important assets that positively influence others' perception of a person, which in turn may increase that person's own self-esteem (Twenge & Campbell, 2002). Cross-sectional studies and meta-analyses have indeed found that parental SES is related to higher self-worth among adolescents (Robins et al., 2002; Twenge & Campbell, 2002). Research is rather sparse on the effect of parental SES on the development of domain-specific self-esteem. However, it is reasonable to predict that parental SES has a particularly strong influence on self-esteem in the academic domain, as numerous studies have shown that parental SES, and especially parental education, is related to academic achievements (Edgerton, Roberts, & Peter, 2013).

Finally, the interpersonal perspective on self-esteem recognizes that self-esteem development is profoundly influenced by interpersonal relationships. Parents, as primary caregivers, may be particularly important in this respect, and studies among adolescents have shown parental support to prospectively predict positive self-perceptions (Boudreault-Bouchard et al., 2013; Parker & Benson, 2004). In accordance with these findings, we hypothesize that perceived high parental care is related to high global self-esteem. Moreover, we predict that this relationship weakens with increasing age, because as adolescents get older, their parents will become less important for their social life. We also predict a rather strong relationship between parental care and self-esteem in social domains, as the parent-child relationship may influence the child's capacity to form later social and intimate bonds (Bartholomew, 1990).

In addition to parental care, structural factors in the family, such as growing up with both biological parents versus experiencing parental divorce, may be important for self-esteem, as such factors may influence the parent-child relationship and lead to socioeconomic disadvantages. Research on well-being corroborates with this hypothesis by showing that adults and children from divorced families on average score lower on well-being than their counterparts in married-couple families (Amato, 2000, 2010).

The Relationship Between Domain-Specific and Global Self-Esteem

The hierarchical, multifaceted conception of self-esteem posits that global self-esteem is particularly influenced by self-esteem in domains that are considered important. One would thus expect correlations between global self-esteem and domain-specific self-esteem to be particularly high for domains that are highly valued in society. Additionally, according to the interpersonal perspective of self-esteem, self-esteem in domains with particular relevance to social and interpersonal aspects may correlate highly with global self-esteem.

Appearance is emphasized strongly in Western societies, as reflected in the media's focus on beauty and attractiveness (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Moreover, the importance of appearance and attractiveness in determining social acceptance has been emphasized, as such easily observable and relatively unambiguous traits are considered to be the most valuable in the formation of interpersonal relationships (Anthony, Holmes, & Wood, 2007). From this perspective, it is not surprising that several studies found appearance self-esteem to be more strongly related to global self-esteem than self-esteem in any other domain (for a review, see Harter, 2012). The interpersonal perspective on self-esteem and the sociometer hypothesis would further predict that self-evaluations of one's own abilities to form close relationships and gain social acceptance are closely related to global self-esteem. The expected strong relationships between self-esteem in social domains and global self-esteem are supported by research showing that the quality of social interaction and a feeling of social inclusion predict global self-esteem (Denissen, Penke, Schmitt, & van Aken, 2008; Leary et al., 1995).

We expect correlations between global self-esteem and self-esteem in domains of a rather non-social nature to be rather small. For instance, studies on global self-esteem and academic achievement found weak relationships between those two constructs, indicating that the relationship between scholastic competence self-esteem and global self-esteem may be of minor strength (Baumeister, Campbell, Krueger, & Vohs, 2003; Pullmann & Allik, 2008). Likewise, rather minor correlations were found between athletic and global self-esteem (Harter, 2012).

Even though correlations between self-esteem in specific domains and global self-esteem are relatively consistent across studies, the correlations may change to a certain degree during adolescence and adulthood; however, research on such potential changes is scarce. It has been shown that the importance attached to appearance, specifically body size and weight, is highest in adolescence and decreases with age (Pliner, Chaiken, & Flett, 1990; Tiggemann, 2004). In

adolescence, when one's own capabilities and roles in society are not yet strongly consolidated, easily observable characteristics such as appearance may be particularly important, whereas other aspects, such as social skills, may become increasingly important as people get older and more mature. We therefore hypothesize that the relationship between global and appearance self-esteem decreases with age, whereas self-esteem in social domains becomes more important.

Finally, even though there have been attempts to explain age trends in global self-esteem by time varying covariates, as far as we know no study has been conducted to examine whether developmental trends in global self-esteem may be explained by self-esteem in specific domains. Since appearance self-esteem has been shown to be the most strongly related to global self-esteem, we propose that this factor also will have the strongest explanatory power in explaining developmental trends in global self-esteem.

Prospective Relationship Between Self-Esteem Trajectories and Important Life Outcomes

A final aim of this study is to examine how trajectories of both global and domain-specific self-esteem are prospectively related to important life outcomes. Although it has been discussed whether self-esteem actually predicts important life outcomes or whether it just is an indicator of them (Baumeister et al., 2003), more recent research has provided support of global self-esteem's positive effects on future outcomes such as good health, satisfaction in marriage and close relationships, social support, low prevalence of criminal behavior, inclusion in the labor force, and increased economic prospects in adulthood (Orth & Robins, 2014; Trzesniewski et al., 2006). However, many questions are still awaiting answers. First, some previous studies used global self-esteem to predict outcomes in specific domains. The research has been criticized, because the specificity matching principle predicts that self-esteem in specific domains would be more effective in predicting domain-specific outcomes (Swann, Chang-Schneider, & McClarty, 2007). Associations between self-esteem and outcomes may therefore be underestimated when

using global measures of self-esteem. Second, previous research has focused almost exclusively on the level of self-esteem as predictor; little is known about the predictive effects of developmental changes in self-esteem on important outcomes. In this study, we will focus on how level and development of global self-esteem and self-esteem in specific domains predict two important outcomes in people's lives: obtained SES (including acquired education, income, and inclusion in the labor force) and prescription of antidepressants as a proxy of depression.

Concerning depression, recent reviews have demonstrated consistent support for low levels of self-esteem influencing depressive symptoms, whereas only weak support was provided for a reverse causal direction (for an overview, see Orth & Robins, 2013; Sowislo & Orth, 2013; Steiger et al., 2014). According to the specificity matching principle, the relationship between global self-esteem and depression should be stronger than between domain-specific self-esteem and depression, because depression is considered to be a rather global, non-specific condition (Sowislo & Orth, 2013; Swann et al., 2007). Moreover, it was also found that adolescent self-esteem in the social, academic, and physical appearance domains was related to subsequent depressive mood, albeit with weaker effects than global self-esteem (Bolognini, Plancherel, Bettschart, & Halfon, 1996; Steiger et al., 2014). Only one study examined how changes in global and domain specific self-esteem influence later depressive symptoms; the results showed that declines in global self-esteem and self-esteem in physical appearance and academics during adolescence were predictive of depressive symptoms two decades later, over and above the effect of initial adolescent self-esteem level (Steiger et al., 2014). How change in other domains of self-esteem is related to depressive symptoms has not been examined up to now.

Concerning SES, a longitudinal study showed that low self-esteem in adolescence was related to several indicators of poor economic prospects at age 26, such as early school leaving, not obtaining higher education, money problems, and work problems (Trzesniewski et al., 2006).

Also other studies found that high global self-esteem was prospectively related to SES and labor inclusion, such as higher earnings (Drago, 2011; Salmela-Aro & Nurmi, 2007), better work conditions (Kuster, Orth, & Meier, 2013), and job satisfaction (Kuster et al., 2013; Salmela-Aro & Nurmi, 2007). However, no longitudinal studies are available on self-esteem in a variety of domains and its effect on obtained SES. The effect of scholastic self-esteem on SES may be of particular importance, as scholastic self-esteem may influence educational attainment, which in turn may influence labor force inclusion and other indicators of SES.

Summary and Hypotheses

To sum up, by using a cohort-sequential study spanning the adolescent and young adult years, we aim to examine several central research questions on the development of global and domain-specific self-esteem. After reviewing the literature, we make the following predictions: First, we predict that global self-esteem will increase during adolescence and young adulthood, which would be in accordance with the maturity principle. We also expect to find increased self-esteem in several specific domains, and particularly in those domains where important developmental tasks are accomplished. Second, in accordance with the interpersonal perspective, we predict that global self-esteem and self-esteem in several domains will be higher for men, for individuals who report high parental care, and for persons with high parental SES. Third, global self-esteem is predicted to be particularly highly correlated to physical appearance self-esteem, with declining correlations across age. Self-esteem in social domains may also be rather highly correlated with global self-esteem, with increasing correlations over time. Fourth, self-esteem level and development are hypothesized to predict obtained SES and indicators of depression, with particularly strong relationships between scholastic competence self-esteem and obtained SES and global self-esteem and indicators of depression.

Methods

Procedure and Participants

Questionnaire data were derived from the Young in Norway Study (see Wichstrøm, von Soest, & Kvalem, 2013) collected at four time points: 1992 (T1), 1994 (T2), 1999 (T3), and 2005 (T4). These data were additionally linked to register data from the Norwegian Prescription Database (NorPD) and time series data from Statistics Norway (see von Soest, Bramness, Pedersen, & Wichstrøm, 2012).

The initial sample at T1 was composed of 12,287 students in Grades 7–12 drawn from 67 junior and senior high schools in Norway, with a response rate of 97%. Every school in the country was included in the register from which schools that participated were selected. The sample was stratified according to geographic region and school size, which in Norway is closely related to the degree of urbanization. Each school's sampling probability was proportional to the number of students enrolled at the school, thereby ensuring that the probability of being selected to participate in the study was equal for all students in Norway. In Norway 98.5% of the age cohorts between 13 and 16 attend the ordinary public junior high schools. After graduating from these, 97% begin senior high school. Due to students dropping out of school and courses that take less than 3 years to complete, about 80% of the 18-year-olds are still in high school. Students were mainly born between 1974 and 1979 and were 13 to 18 years of age at T1 and 27 to 31 years of age at T4. Three schools were included at T1 for non-prospective reasons and were not part of the follow-up. At two other schools, the project identification records were lost due to a burglary in the schools' archives. At T2, students who still attended the same school as at T1 were followed up with questionnaires at school. Since a sizable portion of the students had completed their three-year track at the junior or senior high school that they attended at T1, participants no longer at their original school at T2 received the questionnaire by mail. The response rate of those still attending the same school at T2 was 92%. Only students who

completed the questionnaire at school at T2 ($n = 3,844$) were followed up at T3 because of the comparatively lower response rate among those receiving the questionnaire by mail.

Because the study was originally planned to be a two-wave study, new informed consent had to be obtained at T2. Those then consenting ($n = 3,507$; 91%) received questionnaires by mail at T3 and T4, with data received from 2,924 (84%) and 2,890 (82%) participants, respectively. At T4, the respondents were asked for their consent to link the data to several registers, to which 2,606 respondents (90%) agreed. The overall participation rate of the final sample, based on all eligible students at T1 who still were at their original school at T2, was therefore 68% at T3, 67% at T4, and 60% concerning assessment of register data. Only data from students born between 1974 and 1979 and who had participated in the study at at least three time points were included in the present research ($N = 3,116$). The study was approved by the Norwegian Data Inspectorate and the Regional Committee for Medical Research Ethics.

Attrition analysis was conducted by including all T1 variables that were used in the study simultaneously as predictors of drop-out at later waves in multiple logistic regressions. The results showed that among the self-esteem variables, low scores on scholastic competence (OR = .85; 95% CI: .76 – .96; $p < .01$) and high scores on romantic appeal self-esteem (OR = 1.25; 95% CI: 1.11 – 1.41; $p < .01$) significantly predicted attrition. Moreover, older age (OR = 1.28; 95% CI: 1.24 – 1.32; $p < .01$), male gender (OR = 1.15; 95% CI: 1.03 – 1.29; $p = .01$), and low scores on parental care (OR = .88; 95% CI: .80 - .97; $p = .01$) were significantly related to drop-out.

Measures

Self-esteem measures. Global and domain-specific self-esteem was assessed by a revised version of the Self-Perception Profile for Adolescents (SPPA) (SPPA; Harter, 1988), which is one of the most used measures of domain-specific self-esteem among adolescents (Gentile et al., 2009; Huang, 2010). The original version is a 45-item self-report scale consisting of nine

subscales. Eight scales were designed to measure self-perceptions in specific domains, whereas one was designed to measure global self-esteem. Each domain is measured by five items, of which approximately half are reversed to avoid acquiescence. The original scale consisted of a rather complicated response format, which has been described as time consuming and leading participants to misunderstand the logic behind the question format (Wichstrøm, 1995). As a consequence, in this study we used a revised version of the scale with a simplified response format, where each statement of the scales was followed by four response options from 1 (*describes me poorly*) to 4 (*describes me very well*). The original version of the SPPA showed good convergent and factorial validity (Cole et al., 2001; Harter, 1988; Trent, Russell, & Cooney, 1994; Wichstrøm, 1995). Moreover, a validation study of the revised version showed that the revised scale had psychometric properties that were similar to or even better than the original scale (Wichstrøm, 1995).

In this study, we included seven of the nine scales of the SPPA. Two scales were not included: The Job Competence subscale was omitted, because at T1 most of the participants were at an age where they typically did not yet have a part-time job; the Behavioral Conduct subscale was not included, because this scale showed low reliability in several studies (Harter, 1988; Trent et al., 1994). Of the seven domains included, global self-esteem was assessed by the Global Self-Worth subscale, with an internal consistency ranging from $\alpha = .78$ to $\alpha = .81$ across time points. Moreover, the remaining six subscales assessed self-esteem in the domains of Physical Appearance ($\alpha = .86$ to $\alpha = .90$), Social Acceptance ($\alpha = .77$ to $\alpha = .83$), Close Friendship ($\alpha = .78$ to $\alpha = .83$), Scholastic Competence ($\alpha = .69$ to $\alpha = .72$), Romantic Appeal ($\alpha = .75$ at all time points), and Athletic Competence ($\alpha = .79$ to $\alpha = .82$). Global Self-Worth, Appearance Evaluation, Social Acceptance, and Close Friendship were included at all four measurement points (T1-T4);

the subscales Scholastic Competence, Romantic Appeal, and Athletic Competence were included at the first two measurement points only (T1-T2).

Even though all self-esteem measures showed acceptable internal consistency, these figures provide no information about whether global self-esteem and self-esteem in specific domains are in fact separate constructs or not. This may be a particular concern for global self-esteem and self-esteem in the domain of physical appearance, as these constructs are highly correlated (Harter, 2012). However, support for the conceptual separability of the Global Self-Worth and the Physical Appearance subscales was recently provided by confirmatory factor analyses (Wichstrøm & von Soest, 2015) using the same data set as used in this study.

Moreover, items of the SPPA may have been interpreted differently across time points. We therefore conducted confirmatory factor analyses for each type of self-esteem to test for measurement invariance. For global self-esteem, latent factors based on the five indicators were constructed for each wave, and factors were modeled to correlate across time points. Error variances from identical items measured at different time points were allowed to correlate. We compared models where factor loadings of the global self-esteem factor were estimated freely with models where factor loadings were forced to be equal across time points. The results showed a significantly reduced fit according to the χ^2 difference test ($\Delta\chi^2[12] = 53.14, p < .01$). However, as χ^2 values depend on sample size and a large sample was used in this analysis ($n > 3,000$), even minor differences between time points may have yielded statistically significant differences. Model fit indices with values not influenced by sample size were therefore compared for the models with and without constraining the factor loadings to be invariant over time. The Bayesian Information Criterion (BIC) showed better model fit for the time invariant model (BIC = 104,649.00) than for the model without constraints (BIC = 104,692.40). Moreover, almost identical model fit for time invariant and time variant models were obtained when inspecting

other fit indices; constraint model: Confirmatory Fit Index (CFI) = .973; Tucker-Lewis Index (TLI) = .965; Root Mean Square Error of Approximation (RMSEA) = .036; unconstraint model: CFI = .975, TLI = .964, RMSEA = .036. Measurement invariance was tested similarly for all six domain-specific measures of self-esteem. For all models, BIC values indicated better fit for constraint models than for the unconstraint models, even though χ^2 difference tests showed statistically significant differences for physical appearance, social acceptance, close friendship, and scholastic competence self-esteem between constraint and unconstraint models ($p < .01$). For all six domain-specific self-esteem measures, at least two of the other three fit indices (CFI, TLI, RMSEA) showed better fit for the constraint models. The analyses thus indicated considerable, if not perfect, measurement invariance across time for all seven measures of self-esteem.

Potential predictors of self-esteem trajectories. The respondents' gender and whether or not participants were living with both biological parents were assessed by self-report at T1. Parental care towards the respondent was measured at the first wave using the Care subscale of a revised version of the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979). The PBI is the most frequently used measure of parenting style and has gained wide acceptance as a robust measure of perceived parenting (Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005). In the original version, perceptions of relationship with father and mother were rated separately; in the version used in this study, the mothers' and fathers' scales were collapsed and the number of items for the Care subscale was reduced to five. This shortened version of the scale was shown to have good psychometric characteristics and construct validity (Pedersen, 1994). The scale was included in the study at T1 only, because it is constructed to measure parent-child relationships up to the age of 16 (Parker et al., 1979). Internal consistency of the Care subscale was 0.73. As a measure of parental SES, national register data from Statistics Norway were used, providing

information on the highest parental education level when the respondent was 16 years old, ranging from 1 (*junior high school or lower education*) to 4 (*higher university degree*).

Life outcomes that may be prospectively related to self-esteem trajectories. National register data from Statistics Norway was used to obtain information about several aspects of participants' socioeconomic situation. We used information from registers for the year at which the participant turned 31 years of age. However, since register data were available only up to 2009, data for the youngest cohort (born in 1979) were available only for those who were age 30. Data from 2009, when participants were 30, were thus provided for those born in 1979. First, participants' highest level of education at age 31 (30 for those born in 1979) was obtained and coded into five categories ranging from 1 (*junior high school*) to 5 (*higher university degree*). Second, register data on gross annual income at age 31 (30) was recoded into 10 equally sized groups. The groups were given values from 0 to 1, with 0 representing 10% of respondents with the lowest incomes and 1 representing 10% of respondents with the highest incomes; other groups received values in between. Third, a dummy variable was constructed to indicate whether respondents had received social or unemployment benefits when they were 31 (30) years of age. We also obtained data from the nationwide Norwegian Prescription Database providing information on all prescriptions dispensed at all Norwegian pharmacies (Furu et al., 2010). A dummy variable was constructed indicating whether respondents had received at least one prescription of antidepressants (all medications with the Anatomical Therapeutic Chemical code N06A) in the two years after the last data collection (i.e., in 2006 and 2007).

Covariates. In analyses examining potential prospective relationships between self-esteem and important life outcomes, in accordance with Trzesniewski and colleagues' (2006) study, we controlled for variables that may confound the results. At T2, the participants' grades in the three major school subjects Norwegian, English, and mathematics were combined to a

mean score. Gender and parental education at the respondent's age of 16 was used as covariate as well (variables already described above).

Analyses

To model developmental trajectories, cohort-sequential latent growth models were constructed for global self-esteem and for self-esteem in each of the six specific domains separately. More specifically, as respondents were born between 1974 and 1979, respondents were divided into six age cohorts according to their birth year. Multiple group analysis in the framework of structural equation modeling was then used, where each of the six groups was defined by one age cohort. The same latent growth curve model was constructed in each group. Factor loadings for growth factors were parameterized according to individuals' age, such that a common growth trajectory for self-esteem across all six groups was specified (for a more detailed account of the analytical framework, see Duncan, Duncan, & Hyman, 1996; Preacher, Wichman, MacCallum, & Briggs, 2008). Thus, based on multiple group analyses, growth curves were constructed representing development in the self-esteem constructs from age 13 to age 31 for each of the four subscales from which data from all four time points were available. Development from age 13 to age 20 was modeled for the other three self-esteem subscales. For each type of self-esteem, linear and non-linear trajectories were tested by including linear and quadratic slope factors in growth curve models. We thus estimated three parameters in the most complex growth curves: the intercept, representing estimated initial levels of self-esteem at age 13, the slope, representing linear change, and the quadratic slope, representing quadratic change. Cubic trends could not be estimated, because the models did not converge. As in prior publications using the same analytical framework (Orth et al., 2010), the BIC was used to compare the fit of linear versus quadratic developmental models. We tested for cohort effects by comparing BIC statistics of multiple group models where growth factors (intercept, slope, quadratic trend) were

constrained to be equal across the six age cohorts with models where these factors were unconstrained. The BIC was chosen to select models because fit indices like χ^2 values depend on sample size, and a large sample was used in this analysis ($N > 3,000$); we would risk basing model selection on minor improvements in fit that would probably not be replicated in other samples. Gender differences in trajectories were examined with conditional growth curve models by regressing growth factors (i.e., intercept, slope, and quadratic growth factor) on gender. Other time invariant covariates were included in the model in similar ways. Continuous time invariant covariates were mean centered.

We examined whether correlations between global self-esteem and the six domain specific types of self-esteem were stable or changed over time by modeling covariances between global self-esteem and each domain specific self-esteem component. Again, multiple group analyses in a cohort sequential design were used, such that one covariance for each age from 13 to 31 years was estimated. Additionally, parameter constraints were introduced to examine: (1) whether covariances were stable across age, (2) whether covariances changed in a linear fashion, or (3) whether covariances changed in a quadratic, curvilinear fashion.

The impact of time varying covariates on trajectories of global self-esteem was examined by regressing the repeated measures of self-esteem directly on the mean centered covariates. The model thus reflects trajectories in self-esteem controlled for occasion-specific effects of the time varying covariate (see Bollen & Curran, 2006; Preacher et al., 2008). Regression coefficients between covariates and self-esteem were constrained to be equal across time points, assuming the covariate effect on self-esteem to remain stable across occasions.

Consequences of self-esteem trajectories were examined by regressing potential consequences on the intercept and growth factors of self-esteem measures. For dichotomous dependent variables, probit regressions were modeled. Measures of proportion of explained

variance (R^2) were based on the underlying continuous latent response variable estimated approach (McKelvey & Zavoina, 1975), which has been considered a very appropriate way to conceptualize explained variance in probit models (Snijders & Bosker, 2012).

Model fit was evaluated by inspecting χ^2 statistics, CFI, TLI, and RMSEA. According to recommendations in the literature, CFI and TLI values of .95 or greater and RMSEA values of .06 or lower were considered as indicating good fit (Hu & Bentler, 1999). Full information maximum likelihood estimation procedures were used for most analyses, thereby providing missing data routines that are considered to be adequate (Preacher et al., 2008; Schafer & Graham, 2002). When using probit models, a robust weighted least squares estimation procedure was employed, where missing data were handled by a procedure based on pairwise present analysis (Muthén & Muthén, 2012). The statistical program Mplus 7.0 was used for all analyses (Muthén & Muthén, 2012).

Results

Trajectories of Global and Domain-Specific Self-Esteem

In a first step, we constructed cohort-sequential latent growth models for each type of self-esteem. As indicated by BIC values presented in Table 1, models including quadratic trends described the development most appropriately for global self-esteem, physical appearance, social acceptance, close friendship, and romantic appeal self-esteem, whereas linear trends most appropriately described scholastic competence and athletic competence self-esteem. For romantic appeal self-esteem, the variance of the quadratic slope was set to 0 to allow for convergence of the model.

As a next step, we tested for cohort differences in the trajectories of the seven different types of self-esteem by freeing up cross-cohort constraints in the intercepts, slopes, and – where appropriate – quadratic slopes. For the four types of self-esteem that were assessed at four data

collection waves, intercept, slope, and quadratic slope constraints across cohorts could be freed up simultaneously, and BIC values for all four models were lower in the constrained models, thereby indicating no cohort effects in self-esteem trajectories (see Table 1). For the remaining three types of self-esteem, parameter constraints had to be freed up for intercepts, slopes, and quadratic slopes separately, because the models did not converge otherwise. The results showed scholastic competence and romantic appeal to be cohort invariant concerning all growth factors, as indicated by comparably higher BIC values for all unconstrained models (scholastic competence: BIC = 7,910.08 with unconstrained intercept, BIC = 7,918.76 with unconstrained slope; romantic appeal: BIC = 9,242.02 with unconstrained intercept, BIC = 9,241.81 with unconstrained slope, BIC = 9,245.86 with unconstrained quadratic slope). However, BIC values slightly improved for athletic competence, both when freeing up the intercept (BIC = 9,551.18) and the slope (BIC = 9,551.55) across cohorts. As Table 1 shows, TLI, CFI, and RMSEA values indicated generally good fit for all final models, with the exception of RMSEA values being somewhat higher than what would be preferable with respect to athletic competence, scholastic competence, and physical appearance self-esteem models.

Figure 1 and Table 2 present graphical representations and growth parameters of global self-esteem and self-esteem in the six specific domains. Figure 1 shows significant increases over age for estimated scores of global self-esteem and self-esteem in all domains but scholastic competence. Cohen's d estimates of the change from age 13 to the endpoint age (age 31 / age 20) showed an increase in romantic appeal with a moderate to large effect (Cohen's $d = .68$; see Table 2). Small- to medium-sized increases were observed for global self-esteem and self-esteem in the domains of physical appearance, social acceptance, and close friendship (d between .30 and .38), whereas increases in athletic competence were small in size ($d = .20$).

The Effects of Time Invariant Covariates on Self-Esteem Trajectories

In a next step, we examined whether self-esteem trajectories differed according to gender. For this purpose, growth parameters for global self-esteem and self-esteem in six specific domains were regressed on gender. By varying the coding of time (see Muthén & Muthén, 2000), we examined potential gender differences both at the initial age of 13 years and at the endpoint age (i.e., age 31 and age 20 for four and two measurement points, respectively). Table 3 reports regression coefficients of the path between gender and growth parameters, and Figure 2 depicts resulting estimated gender specific trajectories. As the table and the figure show, we found statistically significant gender differences in all types of self-esteem. Concerning global self-worth, male adolescents showed initially higher mean scores at age 13. However, global self-worth developed differently for men and women, as indicated by the significant regression coefficient of the quadratic slope, with a narrowing of the gender gap with increasing age, and no significant gender differences at age 31. Similar gender differences in both the intercept and the quadratic slope were observed for physical appearance. However, initial gender differences were larger and were only reduced to some degree over age. Even though there were slight gender differences in all three growth parameters for social acceptance, the mean levels and trajectories for males and females were similar. Close friendship was the only scale showing consistently higher self-esteem scores for women than men, which was reflected in a greater initial status for female adolescents and similar developmental trends for both genders. Scholastic competence showed a somewhat higher level for men than women, without much change over age. Finally, both romantic appeal and athletic competence showed initial higher scores for men. However, whereas the gender differences in athletic competence further increased slightly with age, the gender difference for romantic appeal remained stable. Note that trajectories in scholastic competence, romantic appeal, and athletic competence describe development only from ages 13 to 20.

Developmental differences according to other time-invariant covariates were examined as well in different sets of analysis. As Table 3 shows, parental education was most strongly related to self-esteem in the domain of scholastic competence, where those with low parental education showed a considerable lower initial self-esteem score than those with high parental education. No other measure of self-esteem showed significant initial differences according to parental education. However, self-esteem in the domains of physical appearance, close friendship, and romantic appeal increased somewhat more steeply for persons with parents with high education levels compared to others. We also examined whether not living with both biological parents were related to the initial level and growth of self-esteem measures. Here, initial self-esteem in the domain of scholastic competence was somewhat higher among children living with both biological parents. Likewise, higher scores in global self-esteem and physical appearance self-esteem were observed for those living with both biological parents, even though those effects were of rather minor size (Table 3).

Finally, parental care was examined as predictor of self-esteem trajectories. Since parental care was assessed by self-report at the first time point, where respondents' age varied, we first examined whether parental care varied by respondents' age at T1, to investigate potential cohort effects in parental care. However, the correlation between cohort (1974 to 1979) and parental care was not significant, $r = -.003$, $p = .87$. As Table 3 shows, high parental care was positively related to initial status of all self-esteem measures except romantic appeal and showed significant negative relationships to linear growth for all self-esteem scores but scholastic competence and romantic appeal. The strongest relationships between both initial status and linear growth were observed for global self-esteem. Figure 3 presents estimated trajectories of global self-esteem for individuals scoring one standard deviation above and below the mean score of parental care, respectively. As the figure shows, the greatest difference between the two trajectories is seen to

be in the early years, whereas the difference decreased somewhat with age. The estimated difference at age 13 between adolescents scoring one standard deviation above and those scoring one standard deviation below on parental care was substantial, with a rather large effect size (Cohen's $d = .71$). Developmental gender differences according to parental care were similar for other self-esteem measures, even though the differences were somewhat smaller.

In a final set of analyses, we conducted multiple regression analyses where all four time invariant covariates (gender, parental education, not living with both biological parents, parental care) were included simultaneously as predictors of growth factors of global and domain-specific self-esteem. Overall, the results were similar to results of the bivariate analyses, with only minor changes in the regression coefficients.

The Relationship Between Global Self-Esteem and Domain-Specific Self-Esteem

In a next series of analyses, we examined the relationship between global self-esteem and self-esteem in the six specific domains and whether those correlations remained stable or changed across age. Figure 4 shows a graphical representation of the results of the estimated correlations, as modeled through parameter constraints. The highest correlations with global self-esteem were found for physical appearance self-esteem, with correlations about $r = .7$. Even though significant linear and quadratic trends in the correlations were observed ($p < .01$), the changes over age were of rather minor size. Rather high correlations were also estimated between social acceptance self-esteem and global self-esteem, with a significant linear increase over age ($p < .001$). A similar significant linear increase was seen for the correlations between close friendship self-esteem and global self-esteem ($p < .001$); however, the correlation was generally lower than for social acceptance. Correlations with self-esteem in the domains of scholastic and athletic competence were moderately sized and did not change significantly with age ($p > .05$). Finally, the correlation

between global self-esteem and romantic appeal self-esteem increased rather steeply from low levels at age 13 ($r = .27$) to a considerable correlation at age 20 ($r = .50$).

We also aimed to examine whether the development of global self-esteem over age could be accounted for by development of self-esteem in specific domains. Because of the substantial gender differences in the development of global self-esteem, we also examined whether domain-specific self-esteem accounted for developmental gender differences. To this purpose, physical appearance self-esteem was included first as a time-varying covariate in growth curve analyses modeling global self-esteem trajectories. In these analyses, gender was included as a time-invariant covariate. Figure 5 depicts the resulting trajectories for men and women, also contrasted with trajectories without control for physical appearance self-esteem. As the figure shows, when including physical appearance self-esteem as a covariate, both men and women's global self-esteem trajectory showed virtually no differences over age and gender. Physical appearance self-esteem could thus statistically explain large parts of both growth and gender differences in global self-esteem. Comparable analyses were conducted for self-esteem in the five other specific domains; however, self-esteem in any of the other five domains was not able to explain a substantial part of the development or the gender difference in global self-esteem (figures not shown).

Prospective Relationships Between Self-Esteem and Important Life Outcomes

Finally, we examined the potency of global and domain-specific self-esteem trajectories to predict measures of obtained SES and prescription of antidepressants, as assessed by register data. For this purpose, outcomes were regressed on intercepts and growth factors of global self-esteem and self-esteem in the six specific domains separately. Additionally, analyses were repeated with control for gender, school grades, and parental SES. Table 4 presents the results of these analyses. Concerning education, of all seven self-esteem measures, self-esteem in the

domain of scholastic competence was clearly the most strongly related to higher levels of education, with initial status and linear growth explaining 18% of the variance in education. Also initial status and growth of several other self-esteem measures were predictive of education; however, no other measure of self-esteem explained more than 3% of the variance. However, the predictive power of scholastic competence self-esteem was greatly reduced when controlling for covariates. Scholastic competence self-esteem was also the best predictor for income, with 9% explained variance, followed by self-esteem in the domain of athletic competence and global self-esteem. Again, relationships were reduced to a considerable degree when controlling for covariates. Trajectories of global self-esteem and close friendship self-esteem were the most potent to explain unemployment and reception of social welfare benefits, as indicated by the measure of explained variance based on the underlying normal distribution of the probit results. Controlling for covariates did not reduce the relationships substantially. Finally, global self-esteem trajectories were clearly the most powerful in predicting prescription of antidepressants, with 17% explained variance, even after controlling for covariates. Physical appearance and social acceptance self-esteem showed substantial relationships to prescription of antidepressants as well.

Discussion

In this study, developmental trajectories of global and domain-specific aspects of self-esteem from adolescence to young adulthood were examined in a large-scale, population-based cohort-sequential study. Global self-esteem and self-esteem in most domains increased over age, thereby supporting the maturity principle. Moreover, except for self-esteem in the social domains, men reported higher self-esteem scores, with some gender differences becoming closer with age. Whereas parental education particularly influenced scholastic self-esteem, parental care had a comparably strong relationship to several self-esteem facets, with the strongest to global self-

esteem. Self-esteem in the physical appearance domain showed particularly high and relatively stable correlations with global self-esteem, whereas self-esteem in the social domains showed increasing correlations with global self-esteem with increasing age. However, romantic appeal self-esteem showed an especially high increase in its correlation with global self-esteem. Finally, concerning important life outcomes, level and development of scholastic competence self-esteem were strongly related to subsequent education and income; however, most of these relationships were explained by covariates such as parental SES and grades at school in adolescence. Global self-esteem showed a substantial negative relationship to prescription of antidepressants, even after controlling for covariates.

Self-Esteem Development

The results of this study support recent findings showing global self-esteem to increase through adolescence and young adulthood (Erol & Orth, 2011; Galambos et al., 2006; Huang, 2010; Orth et al., 2012; Shaw et al., 2010; Steiger et al., 2014; Wagner, Ludtke, et al., 2013). Even the size of global self-esteem change across age is comparable with previous research, as the small- to medium-sized increase in global self-esteem in this study ($d = .30$) was almost identical to another study covering about the same age span ($d = .32$; Erol & Orth, 2011). New in this study is comprehensive information on self-esteem development in a variety of specific domains. The long-term perspective of this study provides sound support for increasing levels of self-esteem in most domains from adolescence through young adulthood, which is in accordance with other studies showing similar trends in adolescence for some domains (Cole et al., 2001; Steiger et al., 2014; Young & Mroczek, 2003). Moreover, the fact that self-esteem increases were small to medium sized in most domains over a long time span may explain several non-findings in domain-specific self-esteem studies examining shorter age spans. In particular, the few mean level changes found in the one longitudinal study examining domain specific self-esteem in

young adulthood (Donnellan et al., 2007) may be due to small-sized increases over a study period of only four years. Our study results also indicate that self-esteem trends level out in several self-esteem domains in young adulthood, making it even more difficult to detect mean level changes at those ages.

The study results are in accordance with the maturity principle, as development through adolescence and young adulthood is characterized by adapting to new social roles and becoming more confident and capable in a variety of different domains (Trzesniewski et al., 2013). Such a mechanism is particularly visible in the domain of romantic appeal, where a strong increase from age 13 to age 20 was observed. Adolescence is typically a phase of formations of first intimate relationships. The increase in romantic appeal self-esteem may reflect increasing experience and competencies in attracting potential partners. Likewise, increases in other social domains may be an expression of maturing, as the increased self-esteem may be the result of adapting to social roles and increasing skills in the interpersonal domain. Some of the favorable development in physical appearance self-esteem may be due to bodily changes and increased grooming behaviors. However, more likely, increases in appearance self-esteem may be explained by more realistic perceptions of what can be considered as attractive. For instance, as they get older, adolescents may eventually recognize that the beauty ideal in today's society is an ideal that almost nobody can achieve. This realization may lead to less internalization of the physical appearance ideals communicated by the media and by peers. Moreover, when getting older, most people will eventually establish long-term intimate relationships in which appearance is less important, which in turn may lower one's own standards for appearance and increase satisfaction with one's own appearance (McKinley, 2006). Finally, self-esteem in the scholastic domain remained stable across the adolescent years, which may be due to the fact that achievements at school can be rather easily validated by grades, and grades do not change at the group level.

Predictors of Self-Esteem Development

Like most other studies (Kling et al., 1999), we found small- to medium-sized gender differences in adolescence in global self-esteem, with male adolescents reporting higher scores than female adolescents. Likewise, male adolescents' self-esteem scores at age 13 were significantly higher in all specific domains except social acceptance and close friendship. Gender differences in athletic competence may be explained by observable differences in athletic skills between men and women; however, no objective male advantage in the domains of appearance, romantic appeal, and scholastic achievements is expected. On the contrary, as to scholastic competence, Norwegian research has consistently found girls to have better school grades than boys (Borg, 2013). The male adolescents' higher self-esteem scores in these domains, therefore, support the interpersonal perspective of self-esteem, as such findings may be explained by different societal standards for the genders, where women are exposed to beauty ideals that are more difficult to live up to and perceive own academic achievements as less favorable than men do (Gentile et al., 2009).

Gender differences in global self-esteem decreased from adolescence to young adulthood, a finding that some other studies also reported (Galambos et al., 2006; Kling et al., 1999). Previous explanations of the narrowing gender gap have focused on young adults' transitions in their twenties that may enhance well-being and self-confidence, particularly for women. For instance, it was proposed that girls experience power and influence to a lower degree than boys in adolescence, whereas the young adult years provide circumstances enabling women to be independent in a similar way to men, which increases women's well-being, self-confidence, and self-esteem to a greater degree than men's (Galambos et al., 2006). This study adds that narrowing gender gaps are observed not only in global self-esteem but also in the domains of physical appearance and romantic appeal. Moreover, the finding that gender differences in global

self-esteem almost completely vanished when controlling for physical appearance self-esteem indicates that more positive evaluation of one's own appearance among women is an important explanation of the closing gender gap in global self-esteem. Whether the influence of appearance-related issues or greater independence in young adulthood is the most reasonable explanation for women's increase in self-esteem therefore needs to be examined further in future studies.

Close friendship was the only domain where women had substantially higher self-esteem scores than men. This gender difference is in accordance with research showing that women score higher on measures of empathy, sensitive emotional support, and personal disclosure, especially in close friendships (Eagly, 2009; Vigil, 2007). The finding may thus be a result of women in fact having superior competencies in the field of establishing and maintaining intimate relationships, which would be in accordance with the intrapersonal perspective of self-esteem. However, these gender differences are also in accordance with societal gender roles, which attribute communal characteristics to women and agentic traits to men (Eagly, 2009). Gender differences in close friendship self-esteem may thus be explained both by the intrapersonal perspective, focusing on competencies, and by the interpersonal perspective, focusing on which characteristics are expected of men versus women.

In accordance with the specificity matching principle, parental education was most strongly related to scholastic competence self-esteem, a relationship that remained constant over age. A rather strong relationship was observed between parental care and several domains of self-esteem at age 13, with a particularly high relationship for global self-esteem. As far as we know, this relationship has not been examined before in such a comprehensive study. The result indicates – in accordance with the interpersonal perspective – that self-esteem development is profoundly influenced by interpersonal relationships.

The Relationship Between Global and Domain-Specific Self-Esteem

As hypothesized, physical appearance self-esteem had the highest correlation with global self-esteem, compared to self-esteem in other domains, a finding that is in accordance with other studies on this issue (Harter, 2012). Even though some studies found that the importance attached to physical appearance decreases with age (Pliner et al., 1990; Tiggemann, 2004), this study shows only weak indications of reduced correlations between physical appearance self-esteem and global self-esteem over age. Seen from the hierarchical, multifaceted perspective of self-esteem, it seems that physical appearance is clearly the most important determinant of global self-esteem both in adolescence and in young adulthood, thereby reflecting the importance of appearance in Western societies for young people. However, also other causes of the strong relationship between physical appearance and global self-esteem seem possible. The relation may be spurious due to third variables, such as general feelings of well-being, depressive symptoms, or shared genetic origins. Moreover, the causal direction may be reversed, such that global self-esteem influences physical appearance self-esteem. In fact, longitudinal research indicates that the relationship between the two constructs may be in part reciprocal (see Wichstrøm & von Soest, 2015). Thus, the relationship between global and physical appearance self-esteem may not be explained solely by appearance-related concerns influencing global self-esteem.

As hypothesized, the correlation of self-esteem in all social domains (social acceptance, romantic appeal, and close friendship) increased gradually with increasing age, indicating that social skills may become more important as people gradually become more independent of their parents and have to find their own place in their social environment. The particularly strong increase in the correlation between romantic appeal and global self-esteem indicates that not only perceptions of one's own abilities to attract potential partners increase with age but also the importance of obtaining such skills for global self-esteem. The relatively high and increasing correlations of self-esteem in the social domains are in accordance with the interpersonal

perspective on self-esteem and the sociometer hypothesis, as they predict that self-esteem may be particularly influenced by perceptions of social inclusion (Denissen et al., 2008; Leary et al., 1995). Also the high physical appearance–global self-esteem correlation is in accordance with this perspective, as easily observable and relatively unambiguous traits are considered to be the most valuable in the formation of interpersonal relationships (Anthony et al., 2007). Interestingly, of all social domains, close friendship was the domain with lowest correlations with global self-esteem. Both social acceptance and romantic appeal may be domains that are particularly relevant areas for social inclusion, as they may, to a larger degree than close friendships, ease social inclusion.

A final indication of the importance of physical appearance self-esteem is its potential to explain developmental trends of global self-esteem, as both age trends and gender differences in global self-esteem were almost completely accounted for when controlling for levels of physical appearance self-esteem.

The Relationship Between Self-Esteem Trajectories and Important Life Outcomes

Finally, regarding the prospective relationship between self-esteem trajectories and important life outcomes, this study provides information concerning the specificity matching principle. As to acquired SES, the study shows that domain-specific self-esteem prospectively predicts outcomes to a greater degree than global self-esteem does. More specifically, level and growth in scholastic self-esteem were by far the strongest predictors of educational attainment, even though these relationships were reduced when controlling for relevant covariates. This study is thus in congruence with predictions from the specificity matching principle (Swann et al., 2007). Moreover, the comparably strong prospective relationship between global self-esteem and prescription of antidepressants is in accordance with the notion of depression as a rather global, non-specific condition, which should therefore be most strongly related to self-esteem in the

global domain (Sowislo & Orth, 2013; Swann et al., 2007). The study results thus accord with several recent studies showing that self-esteem prospectively predicts important life outcomes, including mental health indicators such as anxiety and depression problems (Orth & Robins, 2014). This study further shows that using domain-specific self-esteem adds important information for predicting life outcomes in specific domains, such as educational attainment.

Strengths and Limitations

This study provides unique information on developmental aspects of self-esteem. Particular strengths are the relatively high number of participants, the population-based sample, the long-term nature of the study, the utilization of register data, and inclusion of self-esteem in a relatively large number of domains. Moreover, the use of a cohort-sequential design is an advantage, as this design has been deemed the most powerful approach to evaluate mean-level changes in self-esteem (Trzesniewski et al., 2013).

However, several limitations have to be noted. First, even though the SPPA shows favorable psychometric properties (Harter, 1988; Wichstrøm, 1995) and is one of the most used measures of domain-specific self-esteem among adolescents (Gentile et al., 2009; Huang, 2010), slightly different results may have been obtained with a different self-esteem scale. For instance, Huang (2010) showed that mean developmental trajectories of global self-esteem differed significantly according to the scale used to assess self-esteem. Moreover, meta-analytical results indicated that estimates of gender differences in global self-esteem differed somewhat according to the measure used, even though all measures showed men to score higher than women (Kling et al., 1999). Replication of the results of this study using other self-esteem scales are therefore of value.

Second, it has been claimed that the personal importance that people attach to their self-views in a specific domain moderates the effect of self-esteem in this domain on global self-

esteem (Pelham, 1995). According to this view, estimating correlations between self-esteem in specific domains and global self-esteem would be of limited value without taking into account importance ratings of these domains. However, the value of importance ratings has been questioned (Donnellan et al., 2007; Marsh, 1995). For instance, one longitudinal study showed that weighting domain-specific self-esteem by importance ratings did not consistently improve the prediction of global self-esteem, which may be partly due to people being unaware of or unwilling to admit the importance of specific domains for their global self-esteem (Donnellan et al., 2007). It is therefore questionable whether including importance ratings would have added important information to this study.

Third, the generalizability to countries other than Norway is an important issue. Generally, rather similar developmental trends and gender differences in global self-esteem across different Western countries, including Norway, have been observed (Kling et al., 1999; Wichstrøm, 1995). Moreover, many results concerning domain-specific aspects of self-esteem are in accordance with research from other Western countries, for instance the high correlation between physical appearance self-esteem and global self-esteem (Harter, 2012). There is therefore no specific reason to expect substantially different findings in other Western countries.

Fourth, even though potential consequences were measured after the assessment of self-esteem, no conclusive information about causality can be drawn. Relationships between self-esteem trajectories and potential consequences may be due to covariates that were not assessed in this study. We also found slight cohort differences in athletic competence self-esteem, such that the results concerning this variable can to a minor degree be confounded by differences between cohorts. Further, when examining potential consequences of self-esteem, for the youngest cohort, register data were only available for potential consequences at age 30 and not age 31, even

though self-esteem trajectories were predicted to age 31. However, additional analyses where the youngest cohort was excluded resulted in virtually the same results.

Fifth, attrition analyses showed several variables at the first time point to be related to drop-out at later time points. Even though the study shows a high initial response rate and analyses were performed with missing data routines that have been recommended in the methodological literature, selective attrition may to a certain degree influence estimates of self-esteem development and relationships between variables.

Finally, even though the use of register data is an advantage in this study, prescription of antidepressants have to be interpreted with some caution as indicator of depression: A considerable number of individuals are not prescribed antidepressants even though they may be clinically depressed (von Soest et al., 2012). Moreover, antidepressants are also prescribed for conditions other than depression, such as for eating disorders.

Conclusion

This study is the first to provide a comprehensive picture of the development of global and domain-specific aspects of self-esteem across adolescence and young adulthood using long-term longitudinal data. The study results show that the maturity principle may be applied not only to personality traits but also to global and domain-specific self-esteem, as self-esteem increases and particularly in domains where new competencies are developed. The interpersonal perspective on self-esteem is supported by showing men to obtain higher levels of self-esteem than women in several domains, without there being objective male advantages in these domains. New is the finding that reported parental care seems to strongly predict levels and rates of change of self-esteem. The exact nature of the relationship between parental care and self-esteem development from childhood on has not yet been examined thoroughly and will be an interesting research focus in future longitudinal studies. By applying an intrapersonal perspective, which

proposes a hierarchical structure of self-esteem, we show that self-esteem in different domains is differently related to global self-esteem. Interestingly, the correlations with self-esteem in the social domains, and particularly with romantic appeal, increased with age. This finding shows that the interpersonal perspective, where domains are valued differently depending on their social importance, is of value. Finally, by examining the predictive ability of both global and domain-specific self-esteem, we show the applicability of the specificity matching principle. The study results indicate that interventions to strengthen global self-esteem may improve life outcomes in general domains. However, many important life outcomes, such as success in education and work, may to a yet greater degree be influenced by self-esteem in more specific domains, such as the academic domain. Interventions aiming at such specific outcomes may thus profit from targeting domain-specific self-esteem. But even though this study gives some indications of prospective relationships, we cannot yet draw firm conclusions regarding the causal relationship between self-esteem in specific domains and important outcomes. This issue will be an important research undertaking in future studies.

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Table 1

Model Fit Indices for Growth Curve Models for Global Self-Esteem and Self-Esteem in Six Specific Domains (n = 3,116)

	Bayesian Information Criterion (BIC)			Model fit of selected models with constraints across cohorts				
	Linear model with constraints across cohorts	Quadratic model with constraints across cohorts	Selected models without constraints across cohorts	χ^2	df	CFI	TLI	RMSEA
Global self-worth	15,934.03	15,919.35	16,006.71	133.53	51	.971	.980	.056
Physical appearance	19,346.40	19,290.69	19,345.58	190.94	51	.966	.978	.073
Social acceptance	14,292.27	14,201.81	14,280.08	139.71	51	.971	.979	.058
Close friendship	18,187.53	18,056.30	18,138.55	146.09	51	.958	.971	.060
Scholastic competence	7,892.52	7,898.59	--	56.01	13	.969	.985	.080
Romantic appeal	9,232.68	9,223.22	--	31.65	12	.983	.992	.056
Athletic competence	9,552.74	9,556.32	--	58.29	13	.979	.990	.082

Note. Models with bold BIC values are selected models.

df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation.

Table 2

Growth Parameters of Global Self-Esteem and Self-Esteem in Six Specific Domains (n = 3,116)

	Intercept	Linear slope	Quadratic slope	Cohen's <i>d</i>
Global self-esteem	2.88***	0.13***	-0.02	0.30
Physical appearance	2.53***	0.34***	-0.11***	0.38
Social acceptance	3.03***	0.35***	-0.15***	0.31
Close friendship	3.10***	0.49***	-0.21***	0.32
Scholastic competence	2.88***	0.04	--	0.06
Romantic appeal	2.52***	0.14	0.61***	0.68
Athletic competence	2.44***	0.19***	--	0.20

Note. Cohen's *d* provides measures of effect size of the change of self-esteem from age 13 to 31 (age 13 to 20 for the last three self-esteem measures). In the growth curves presented here, age is coded such that linear and quadratic slope parameters represent changes during an interval of 10 years. Coding of age was performed in this manner to avoid numerically small estimates. The slope and quadratic growth estimates have to be divided by 10 and 100, respectively, to provide estimates of changes from one year to the next. Estimates of intercepts and effect sizes are not affected by the scaling of age.

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

Table 3

Standardized Regression Coefficients of the Relationship Between Four Time Invariant Covariates and Growth Parameters of Global Self-Esteem and Self-Esteem in Six Specific Domains (n = 3,116)

	Intercept, parameterized as initial status (age 13)	Linear slope	Quadratic slope	Intercept, parameterized as endpoint (age 31/20)
Gender [‡]				
Global self-esteem	-.24***	-.05	.13**	-.05
Physical appearance	-.32***	-.05	.13**	-.18***
Social acceptance	.05*	-.11**	.10*	.01
Close friendship	.27***	-.06	.04	.17***
Scholastic competence	-.10**	.01	--	-.11***
Romantic appeal	-.17***	.04	--	-.11***
Athletic competence	-.25***	-.11*	--	-.28***
Parental education				
Global self-esteem	.05	.03	-.04	.05
Physical appearance	.04	.10*	-.10*	.09**
Social acceptance	.01	.02	.00	.06*
Close friendship	-.04	.10*	-.06	.07**
Scholastic competence	.26***	.04	--	.29***
Romantic appeal	-.05	.15**	--	.13**
Athletic competence	.05	.04	--	.07*
Not living with both biological parents				
Global self-esteem	-.07**	.04	-.06	-.10***
Physical appearance	-.05*	.04	-.05	-.07*
Social acceptance	-.04	.05	-.07	-.07**
Close friendship	-.01	.05	-.06	-.02
Scholastic competence	-.11***	.09	--	-.06
Romantic appeal	.01	.00	--	.02
Athletic competence	-.03	.02	--	-.04
Parental care				
Global self-esteem	.39***	-.23***	.19***	.19***
Physical appearance	.26***	-.17***	.15**	.13***
Social acceptance	.28***	-.10**	.08*	.15***
Close friendship	.24***	-.09*	.09*	.19***
Scholastic competence	.28***	-.16	--	.21***
Romantic appeal	-.05	.14**	--	.13**
Athletic competence	.11***	-.01	--	.08**

Note. The regression coefficient between time invariant covariates and the quadratic slope of romantic appeal self-esteem could not be estimated, because the variance of the quadratic slope was set to 0 to allow for convergence.

[‡]Gender was coded men = 0 and women = 1. Positive regression coefficients thus reflect higher scores for women.

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

Table 4

Standardized Regression Coefficients of Growth Parameters of Global Self-Esteem and Self-Esteem in Six Specific Domains Predicting Labor Market Integration and Prescription of Antidepressants (n = 3,116)

	Without control for covariates			With control for covariates [§]		
	Intercept	Linear slope	R ²	Intercept	Linear slope	ΔR ²
	Education [£]					
Global self-esteem	.08**	.08	.01	.06*	.05	.00
Physical appearance	.04	.08	.01	.04	.05	.00
Social acceptance	.01	.01	.00	-.01	-.01	.00
Close friendship	.00	.10	.01	-.03	.05	.01
Scholastic competence	.43***	.30***	.18	.11*	-.02	.03
Romantic appeal	-.06	.12	.03	-.06*	.06	.01
Athletic competence	.07	.11*	.02	.08**	.08	.01
	Income [£]					
Global self-esteem	.25***	.23***	.05	.14***	.15**	.02
Physical appearance	.22***	.15**	.03	.09**	.04	.01
Social acceptance	.13***	.16**	.02	.13***	.18**	.03
Close friendship	-.04	.07	.01	.07	.14*	.01
Scholastic competence	.28***	.30**	.09	.12***	.03	.02
Romantic appeal	.12***	.09	.01	.06	.04	.00
Athletic competence	.20***	.28**	.06	.15***	.11*	.03
	Unemployed [§]					
Global self-esteem	-.22***	-.23***	.05	-.19***	-.24***	.04
Physical appearance	-.14**	-.12*	.02	-.11*	-.16**	.02
Social acceptance	-.10*	-.14*	.02	-.11*	-.15**	.02
Close friendship	-.03	-.19**	.03	-.11*	-.26***	.05
Scholastic competence	-.14*	-.09	.02	-.17*	-.13	.01
Romantic appeal	.02	-.08	.01	-.03	-.08	.01
Athletic competence	-.12	.05	.02	-.07	.02	.01
	Prescription of antidepressants [§]					
Global self-esteem	-.36***	-.50***	.18	-.29***	-.52***	.17
Physical appearance	-.19***	-.32***	.08	-.12	-.37***	.09
Social acceptance	-.24***	-.36***	.10	-.25***	-.40***	.10
Close friendship	-.12	-.25**	.04	-.25*	-.31***	.08
Scholastic competence	-.11	-.05	.01	-.09	-.05	.00
Romantic appeal	.02	.04	.00	.05	.05	.00
Athletic competence	-.13	-.13	.04	-.08	-.11	.02

Note. Multiple regression analyses are performed where intercept and slope of each self-esteem measure are entered together as predictors.

[§]Controlled for gender, parental SES, and grades in school.

ΔR² = incremental R² when controlled for covariates first.

[£]Linear regression models with maximum likelihood estimators were estimated. Standardized linear regression coefficients are reported.

[§]Probit regression models with a weighted least square estimator were estimated. Standardized probit regression coefficients are reported.

*p < .05. **p < .01. ***p < .001.

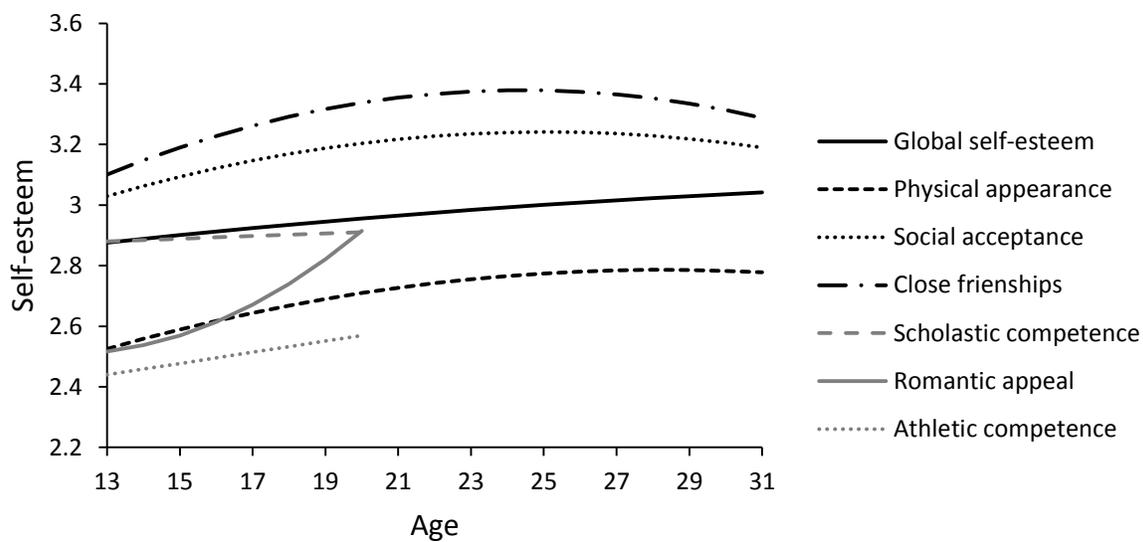


Figure 1. Estimated developmental trajectories of global self-esteem and self-esteem in six specific domains.

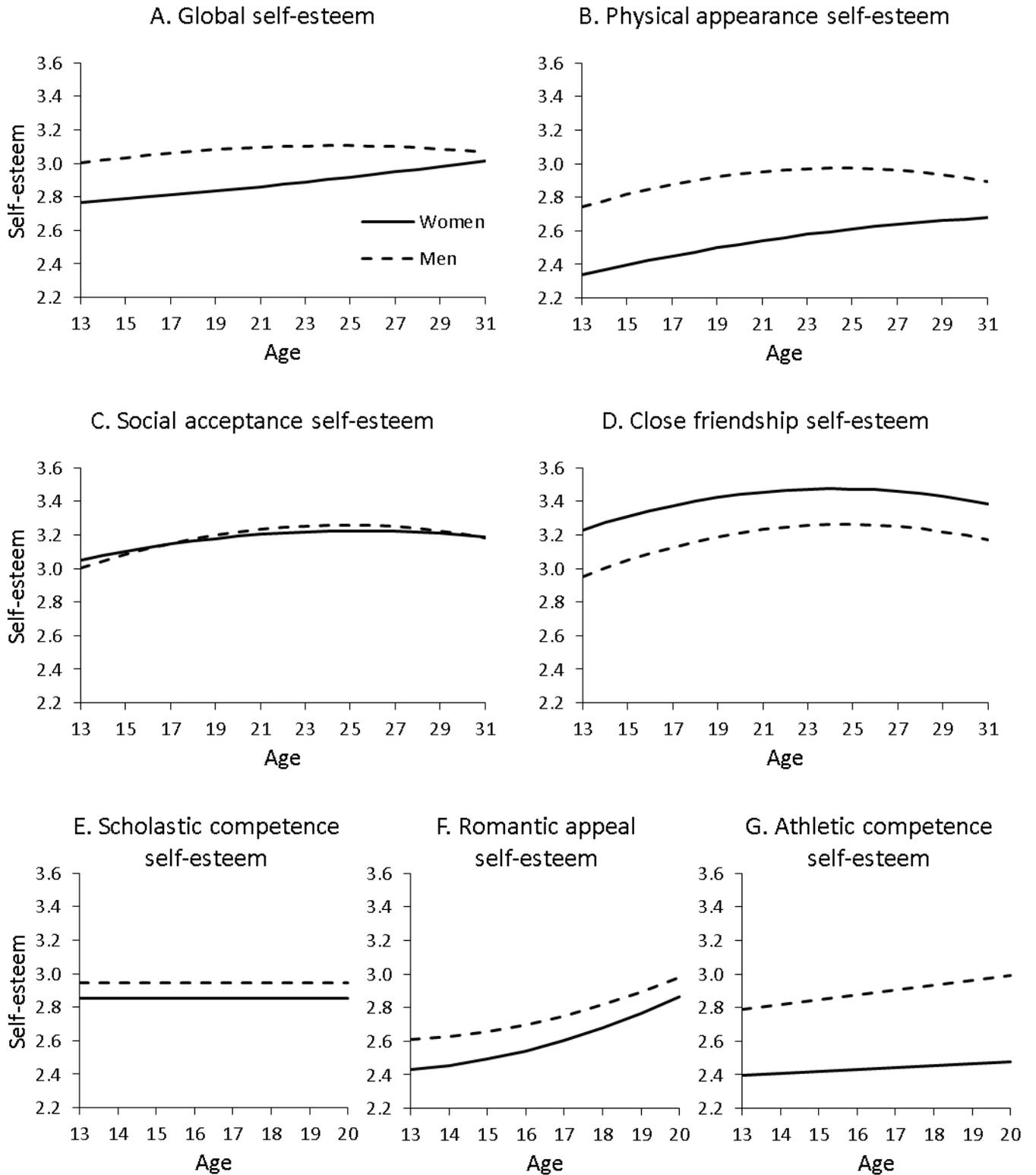


Figure 2. Estimated developmental trajectories of global self-esteem and self-esteem in six specific domains for men and women.

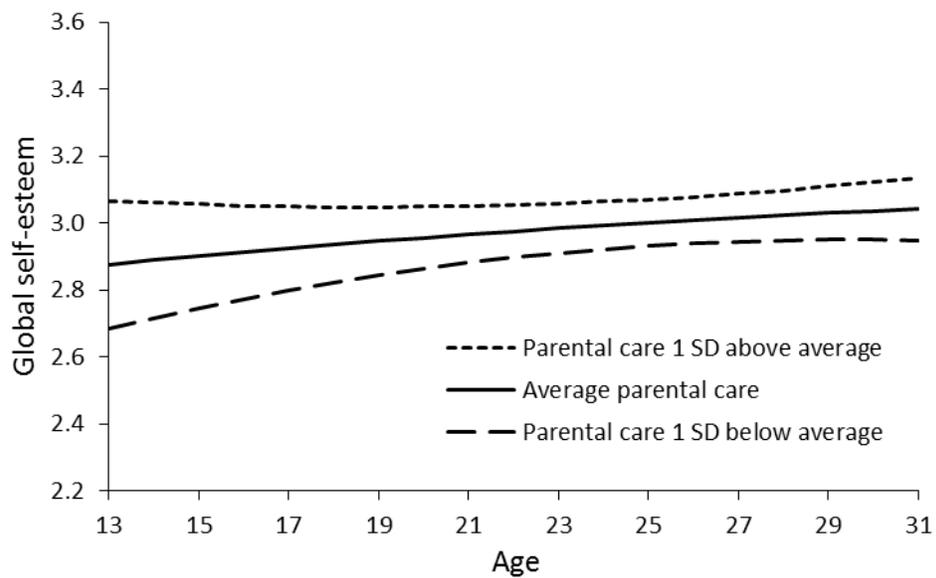


Figure 3. Estimated global self-esteem scores for individuals scoring 1 standard deviation (SD) lower than average and 1 SD higher than average on parental care.

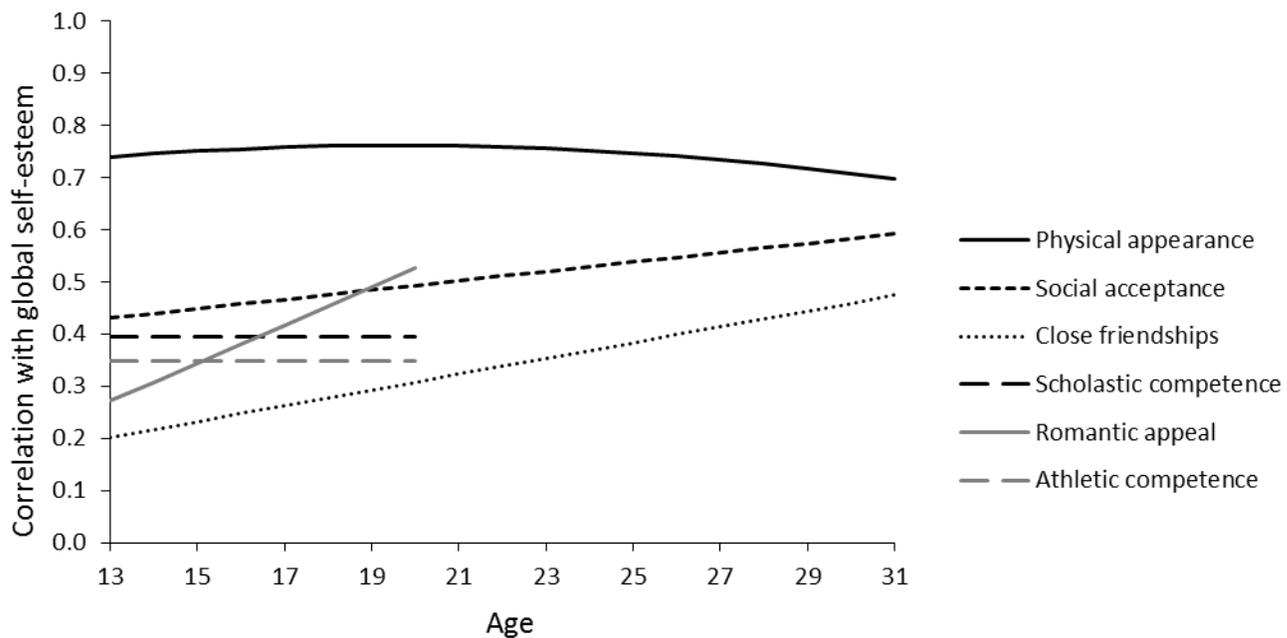


Figure 4. Estimated correlations of global self-esteem with self-esteem in six specific domains from age 13 to 31/20.

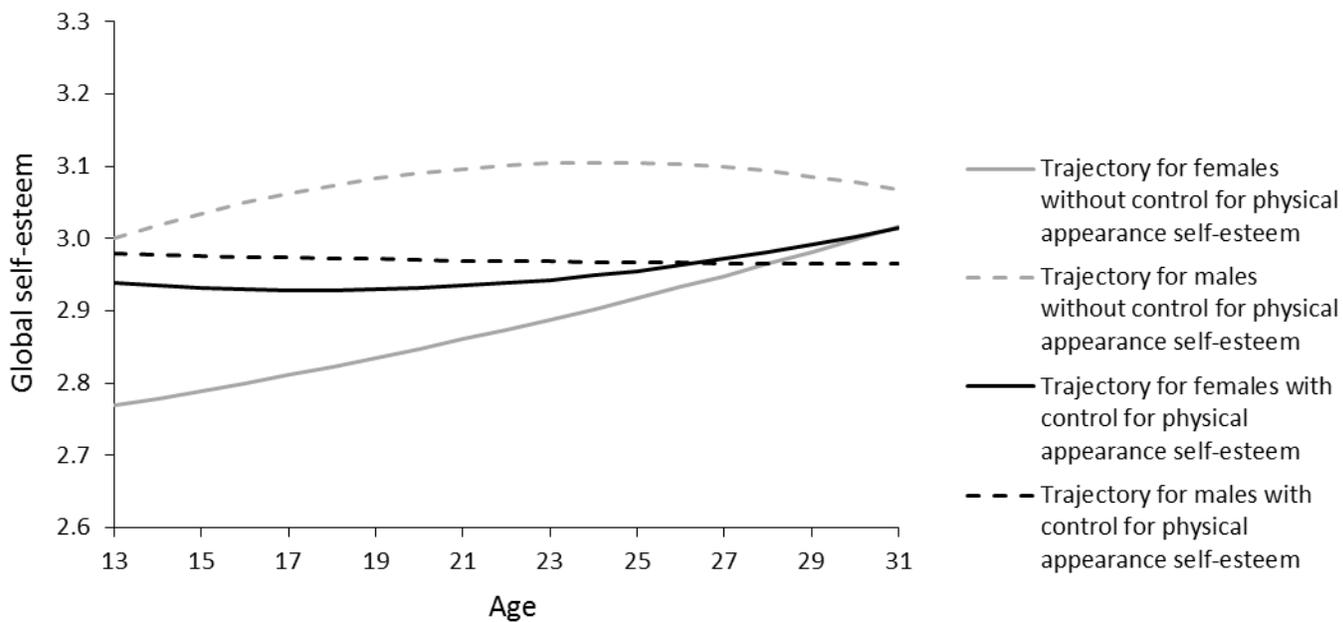


Figure 5. Estimated trajectories of males' and females' global self-esteem controlled for physical appearance self-esteem.