

Transitions in Romantic Relationships and Development of Self-Esteem

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Abstract

Research suggests that self-esteem increases during late adolescence and young adulthood, but that there is large interindividual variability in this development. However, little is known about the factors accounting for these findings. Using propensity score matching, we tested whether important transitions in the domain of romantic relationships (i.e., beginning a relationship, marrying, and breaking up) explain why individuals differ in the particular self-esteem trajectory they follow. Data came from a longitudinal German study with a large sample of three nationally representative cohorts of late adolescents and young adults (total $N = 9,069$). The analyses were based on four assessments across a three-year period. Using matched samples, the results showed that beginning a relationship increased self-esteem and that the increase persisted when the relationship held at least for one year. Experiencing a relationship break-up decreased self-esteem, but the effect disappeared after one year, even if the participant stayed single. Marrying did not influence self-esteem. Additionally, we tested for selection effects of self-esteem on the later occurrence of relationship transitions. High self-esteem predicted the beginning of a relationship and low self-esteem predicted relationship break-up. All findings held across gender, age, and migration background. Furthermore, relationship quality mediated the effect of self-esteem on relationship break-up and the effect of beginning a longer vs. a short relationship on self-esteem. The findings have significant implications because they show that self-esteem influences whether important transitions occur in the relationship domain and that, in turn, experiencing these transitions influences the further development of self-esteem.

Keywords: self-esteem development, life transitions, romantic relationships, propensity score matching, longitudinal

Transitions in Romantic Relationships and Development of Self-Esteem

In recent years, there has been a growing interest in the development of self-esteem. Research has shown that self-esteem—which is defined as “an individual’s subjective evaluation of her or his worth as a person” (Donnellan, Trzesniewski, & Robins, 2011, p.718)—typically increases during late adolescence and young adulthood, but that individuals differ substantially in the particular self-esteem trajectory they follow (e.g., Orth & Robins, 2014; Trzesniewski, Donnellan, & Robins, 2013). However, surprisingly little is known about the factors that shape self-esteem development. Although many researchers assume that events occurring in a person’s life such as establishing a romantic relationship or being promoted have the potential to affect a person’s level of self-esteem, only few studies have actually tested whether important life events and life transitions influence self-esteem (see Orth & Luciano, 2015). Thus, there is a need for a better understanding of the factors that account for individual differences in the development in self-esteem.

In late adolescence and young adulthood, individuals are faced with several important developmental transitions, which involve the adoption of new social roles. One of these transitions is the establishment of a committed romantic relationship (e.g., Hutteman, Hennecke, Orth, Reitz, & Specht, 2014). Romantic relationships are an important life domain because research suggests that relationships influence a wide range of personality and well-being outcomes (e.g., Diener, Gohm, Suh, & Oishi, 2000; Dush & Amato, 2005; Neyer & Lehnart, 2007; Wagner, Becker, Lüdtkke, & Trautwein, 2015). For example, successfully mastering the transition into a committed romantic relationship, establishing a family, and getting married might boost self-esteem. Therefore, the goal of the present study was to test whether important transitions in the domain of romantic relationships have an impact on self-esteem (i.e., a process

called socialization). Since it is possible that self-esteem is not only an outcome but also a cause of relationship transitions (i.e., a process called selection), we tested for effects in both directions. Moreover, we tested whether relationship quality mediates selection and socialization effects between transitions in romantic relationships and self-esteem.

As recently pointed out by Luhmann, Orth, Specht, Kandler, and Lucas (2014), a complicated issue in research on the effects of life transitions is testing the causality of the effects, because experimental designs are neither feasible nor ethically acceptable when studying the consequences of changes in people's life circumstances. Even in studies with longitudinal designs, gaining evidence about causality is difficult since it is not clear whether any observed changes in the construct of interest are caused by the life transition or by confounding variables that have not been controlled for. We therefore used propensity score matching—a method that allows controlling for a large set of variables and helps to get closer to a causal interpretation of the effects of life transitions (later, we describe this method in more detail).

Self-Esteem and Transitions in Romantic Relationships

Research suggests that self-esteem development over the lifespan follows a curvilinear pattern (for reviews, see Orth & Robins, 2014; Trzesniewski et al., 2013). More precisely, the self-esteem of an average person starts to rise in adolescence, continues to increase in young and middle adulthood, peaks at about age 50 to 60 years, and then decreases in old age (Orth, Maes, & Schmitt, 2015; Orth, Robins, & Widaman, 2012; Orth, Trzesniewski, & Robins, 2010).

As mentioned earlier, research has largely neglected the factors that shape the normative self-esteem trajectory. Transitions in relationships such as beginning a romantic relationship, marrying, and separating are promising candidates for these factors because they occur in the lives of many but not all individuals and, importantly, not for everybody at the same age.

Consequently, relationship transitions could account for both normative change and individual differences in change in self-esteem. Moreover, several longitudinal studies suggest that self-esteem might also be a *cause* of relationship outcomes, such as relationship satisfaction and social support (Kuster, Orth, & Meier, 2013; Marshall, Parker, Ciarrochi, & Heaven, 2014; Orth et al., 2012). Thus, it is possible that a person's self-esteem influences whether important transitions—such as beginning a relationship and separating—occur in the relationship domain (Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Orth & Luciano, 2015; Wagner, Becker, et al., 2015).

In the following sections, we review the theoretical perspectives and existing evidence on selection and socialization effects in the domain of romantic relationships.

Selection Effects

According to theory on person-environment transactions (cf. Caspi, Roberts, & Shiner, 2005; Roberts, Wood, & Caspi, 2008), there are several ways by which a person's self-esteem may select for the experience of life transitions. Depending on their level of self-esteem, individuals may actively work towards specific transitions, may be selected into certain social roles by others, and may leave environments that do not fit their personality. For example, individuals with low self-esteem might have a greater probability of experiencing separation and divorce, since they tend to interpret ambiguous behavior of their partners negatively, reduce closeness to the partner in times of relationship conflict, and show problematic behaviors such as excessive reassurance seeking (Joiner, Katz, & Lew, 1999; Murray, Holmes, & Griffin, 2000; Murray, Rose, Bellavia, Holmes, & Kusche, 2002). In contrast, people with high self-esteem show more positive illusions about their romantic relationship, which contributes to relationship

satisfaction and reduces the likelihood of break-up and divorce (Murray, Holmes, & Griffin, 1996a, 1996b).

Furthermore, research suggests that self-esteem influences whether a person experiences success or failure in many life domains (Kuster et al., 2013; Orth et al., 2012; Trzesniewski et al., 2006), including the domain of romantic relationships (Orth et al., 2012). This implies that self-esteem might also influence the occurrence of events that are linked to success and failure. For example, with regard to the relationship domain, several studies have shown that self-esteem prospectively predicts relationship quality and relationship satisfaction (e.g., Johnson & Galambos, 2014; Neyer & Lehnart, 2007; Orth et al., 2012). Additionally, research suggests that couples who experience decreasing relationship satisfaction are more likely to break-up in the future (Karney & Bradbury, 1997) and that relationship satisfaction is a crucial factor for relationship continuation (Hendrick, 1988; Hendrick, Hendrick, & Adler, 1988). Thus, self-esteem might influence whether individuals experience relationship break-up through its effect on relationship satisfaction and relationship quality.

To our knowledge, only three studies provide relevant information regarding selection effects of self-esteem on relationship transitions. These studies have tested for selection effects of self-esteem on the beginning of the first romantic relationship in young adulthood; in none of these studies, a significant selection effect emerged (Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Wagner, Becker, et al., 2015). However, prior research did not test for effects of self-esteem on other relationship transitions such as marrying, separating, and getting divorced.

Additional evidence is available regarding selection effects of self-esteem on events in other life domains. In a study with middle-aged and old adults, self-esteem did not show selection effects on the occurrence of illness and bereavement events (Murrell, Meeks, & Walker, 1991).

However, in a recent study with two samples of adults, low self-esteem predicted the occurrence of stressful life events (Orth & Luciano, 2015). Although the selection effect of self-esteem became nonsignificant when depression was controlled for, it is possible that depression served as a mediator of the selection effect of self-esteem, given that research consistently suggests that low self-esteem leads to depression (Orth & Robins, 2013; Sowislo & Orth, 2013). Given that stressful life events include negative transitions in the relationship domain such as separation and divorce, this study suggests that self-esteem might have selection effects on relationship transitions.

Furthermore, research suggests that other personality characteristics—besides self-esteem—such as the Big Five (Headey & Wearing, 1989; Kandler, Bleidorn, Riemann, Angleitner, & Spinath, 2012; Lüdtke, Roberts, Trautwein, & Nagy, 2011; Magnus, Diener, Fujita, & Pavot, 1993) and affective traits (Vaidya, Gray, Haig, & Watson, 2002) select for the occurrence of life events, including beginning of the first romantic relationship (Neyer & Lehnart, 2007; Wagner, Becker, et al., 2015). Several studies have shown that extraverted individuals are more likely to experience positive life events, whereas neurotic individuals are more likely to experience negative life events (e.g., Headey & Wearing, 1989; Magnus et al., 1993). Given the negative relation between neuroticism and self-esteem, as well as the positive relation between extraversion and self-esteem (e.g., Erdle, Gosling, & Potter, 2009), high self-esteem might select for positive life events, such as the transition into a relationship, whereas low self-esteem might select for negative life events, such as the break-up of a relationship.

Regarding the beginning of the first romantic relationship, Neyer and Lehnart (2007) found selection effects of sociability and neuroticism, whereas Wagner, Becker, et al. (2015) found selection effects of extraversion and low depression. Regarding break-up, Lehnart and Neyer

(2006) did not find any selection effects of personality. Regarding marrying, Specht, Egloff, and Schmukle (2011) found selection effects of neuroticism among women but not among men. Given that the trait character of self-esteem is comparable to other personality characteristics (e.g., Kuster & Orth, 2013; Trzesniewski, Donnellan, & Robins, 2003; Wagner, Lüdtkke, & Trautwein, 2015), and given the substantial relations of self-esteem with the Big Five personality traits (e.g., Erdle et al., 2009) and depression (e.g., Sowislo & Orth, 2013), self-esteem might have similar selection effects on life transitions.

Socialization Effects

Theoretical perspectives suggest that transitions in romantic relationships have the potential to influence a person's self-esteem. According to sociometer theory (Leary, 2012; Leary & Baumeister, 2000), close interpersonal relationships are the central factor of a person's self-esteem. The theory proposes that self-esteem reflects a person's relational value, as subjectively perceived by the individual, and that the self-esteem system evolved as a part of the human mind because it helps the individual to monitor whether the need for social inclusion is satisfied or threatened. The empirical evidence from observational and experimental studies is in line with sociometer theory (for a review, see Leary, 2003), documenting the strong association between self-esteem and social relationships, including romantic relationships (e.g., Denissen, Penke, Schmitt, & van Aken, 2008; Leary, Haupt, Strausser, & Chokel, 1998; Murray, Griffin, Rose, & Bellavia, 2003; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007).

Furthermore, neo-socioanalytic theory of personality development highlights the strong influence of social roles on personality, including the role of a romantic relationship partner (Roberts & Wood, 2006; Roberts et al., 2008). Thus, normative life transitions in romantic relationships, which imply the commitment to new social roles, have the potential to initiate

personality change. The age periods of late adolescence and young adulthood are characterized by change and exploration, which frequently leads to important developmental transitions.

Finding a partner, committing to a romantic relationship, and adopting the new role as a partner is a central developmental task in these age periods (e.g., Havighurst, 1972; Hutteman et al., 2014).

Successfully mastering this developmental task might boost self-esteem.

Moreover, age-related developmental tasks are strongly related to personal goals (e.g. Nurmi, 1992). Research has shown that finding a partner is one of the central life goals in emerging and young adults (e.g., Caspi, 2002; Shanahan, 2000). Therefore, the ideal future self of many emerging adults includes being in a serious committed relationship. Thus, emerging adults likely feel closer to their ideal self when beginning a romantic relationship, which could boost their self-esteem. On the other hand, experiences of break-up or not finding a partner might make individuals feel as getting further away from their ideal self, thus, leading to decreases in self-esteem.

Finally, research has documented large interindividual variability in self-esteem development (Chung et al., 2014; Erol & Orth, 2011; Orth et al., 2010; Wagner, Lüdtkke, Jonkmann, & Trautwein, 2013). Since relationship transitions such as beginning a relationship, marrying, and separating occur in the lives of many, but not all, individuals and at different ages, they have the potential to cause individual differences in self-esteem development.

To our knowledge, only four studies provide evidence on socialization effects of transitions in romantic relationships on self-esteem. All of these studies tested whether the beginning of the first romantic relationship in young adults predicted changes in self-esteem (Lehnart, Neyer, & Eccles, 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Wagner, Becker, et al., 2015). Using data from a German sample of young adults, who were assessed

twice across four years, Neyer and Asendorpf (2001) found that individuals entering a romantic relationship showed an increase in self-esteem. Using data from the same sample, but including a third wave of data, Neyer and Lehnart (2007) replicated this finding for individuals who began their first relationship between the second and third wave of this study. In addition, Neyer and Lehnart (2007) found that the positive effect of beginning a relationship on self-esteem between the first and second wave was still present four years later. However, in a longitudinal study with a U.S. sample of young adults, the evidence was inconsistent: the socialization effect of beginning a relationship was significant for only one out of two intervals examined in this study (Lehnart et al., 2010). Similarly, using three-wave longitudinal data from a sample of young adults, Wagner, Becker, et al. (2015) found inconsistent evidence on the socialization effect of beginning the first relationship on self-esteem. Whereas some of the comparisons examined by Wagner, Becker, et al. (2015) were significant, others were nonsignificant, including long-term effects of beginning a relationship. To summarize, previous studies yielded mixed evidence on the effects of beginning of a relationship on self-esteem.

In addition, one previous study tested whether other transitions in the relationship domain, besides beginning a relationship, influence people's self-esteem. More precisely, Neyer and Asendorpf (2001) examined socialization effects of marrying and relationship break-up, but did not find significant effects. Except for Neyer and Asendorpf (2001), no previous study tested for socialization effects of relationship transitions such as marrying and breaking-up on self-esteem.

Further evidence regarding socialization effects on self-esteem is available for other life domains besides the relationship domain. Murrell et al. (1991) tested whether illness and bereavement events affect self-esteem, and Neyer and Asendorpf (2001) tested whether the transition from education to work and the transition to parenthood influence self-esteem; in both

studies, no significant socialization effects emerged. However, research on stressful life events suggests that life events may alter people's self-esteem (Joiner et al., 1999; Orth & Luciano, 2015; Pettit & Joiner, 2001). Given that stressful life events include negative transitions in the relationship domain such as separation and divorce, this field of research suggests that relationship transitions might have socialization effects on self-esteem.

Additional evidence is available regarding the socialization effects of relationship transitions on other personality characteristics. Research suggests that transitions and other life events influence the Big Five personality factors (Lüdtke et al., 2011; Specht et al., 2011) and well-being (Headey & Wearing, 1989; Lucas, 2007; Luhmann, Hofmann, Eid, & Lucas, 2012). Regarding the beginning of the first romantic relationship, there is evidence that this transition leads to an increase in extraversion and conscientiousness and to a decrease in neuroticism (Lehnart et al., 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Wagner, Becker, et al., 2015). However, in the study by Wagner, Becker, et al. (2015), socialization effects on personality occurred only for individuals who experienced this transition between age 23 and 25 years, whereas no socialization effects were found for individuals between age 21 and 23 years. Regarding relationship break-up, Neyer and Asendorpf (2001) did not find any socialization effects, whereas Lehnart and Neyer (2006) found that individuals experiencing break-up decreased less strongly in neuroticism and became less agreeable compared to individuals who stayed in their relationship. Regarding marrying, a study by Specht et al. (2011) suggested socialization effects on the Big Five: Individuals who got married decreased in extraversion, agreeableness, and openness. As mentioned above, given that the trait character of self-esteem is comparable to other personality characteristics (e.g., Kuster & Orth, 2013; Trzesniewski et al., 2003; Wagner, Lüdtke, et al., 2015), life transitions might show similar socialization effects on

self-esteem. This line of research shows, that romantic relationships play an important role in people's lives affecting a wide range of personality and well-being outcomes (e.g., Neyer & Lehnart, 2007; Wagner, Becker, et al., 2015). Studies suggest that being in a close relationship is associated with higher levels of well-being (Diener, Suh, Lucas, & Smith, 1999). For example, married individuals and individuals in a committed relationship are happier than singles and individuals in a dating relationship (e.g., Diener et al., 2000; Dush & Amato, 2005).

Methodological Problems in Research on Socialization Effects

As mentioned above, Luhmann et al. (2014) described several methodological challenges for studies on socialization effects of life events and life transitions. Clearly, longitudinal designs are needed to control for preexisting individual differences in the outcome (i.e., differences before the occurrence of an event or transition). Moreover, the outcome should be assessed repeatedly after the event or transition, to allow testing whether socialization effects are transient or relatively persistent. Moreover, Luhmann et al. (2014) suggest using propensity score matching, a method that allows controlling for a large set of confounding factors and thereby helps to get closer to a causal interpretation of socialization effects.

Obviously, randomized controlled experiments are not possible in research on the effects of life transitions for practical and ethical reasons. However, when using observational data it is never entirely clear whether observed changes in the outcome can be attributed to the treatment (e.g., a life transition) or whether they have been caused by confounding variables that have not been controlled for. Propensity score matching allows dealing with this problem by adapting observational data in a way that approximates the situation of a randomized controlled experiment (Rosenbaum & Rubin, 1983; Thoemmes & Kim, 2011). More precisely, propensity score matching removes selection effects in the composition of the treatment versus control group

(e.g., participants who did versus did not experience a life transition). Based on the pre-treatment characteristics of the participants, propensity score matching creates a control group that was similar to the treatment group in the *propensity* to experience the treatment, except for the fact that the control group later did not experience the treatment. Consequently, after propensity score matching, any difference in the outcome between the matched treatment and control groups can more likely be attributed to the treatment, because preexisting differences in a large set of confounding variables have been eliminated.

Relationship Quality as a Mediator Between Transitions in Romantic Relationships and Self-Esteem?

What are the mechanisms through which self-esteem selects for the occurrence of a transition? How do transitions in romantic relationships influence self-esteem? So far, none of the studies that investigated selection or socialization effects in the domain of romantic relationships tested for mechanisms linking self-esteem to relationship transitions. Nevertheless, evidence suggests that relationship quality might account for selection effects of self-esteem on transitions in romantic relationships. Longitudinal research indicates that self-esteem predicts relationship quality (e.g., Johnson & Galambos, 2014; Neyer & Lehnart, 2007; Orth et al., 2012), which, in turn, is a crucial factor for relationship continuation vs. break-up (Hendrick, 1988; Hendrick et al., 1988; Karney & Bradbury, 1997). Moreover, relationship continuation obviously is a precondition for marriage. This suggests that relationship quality might be a mediator of effects of self-esteem on relationship continuation, break-up, and marrying.

Regarding socialization effects of relationship transitions on self-esteem, no evidence on mediating mechanisms is available. However, as described above, sociometer theory posits that self-esteem reflects the relational value of a person as perceived by the person him- or herself

(Leary, 2012; Leary & Baumeister, 2000). Thus, it is likely that an unstable, low-quality romantic relationship worsens the perceived relational value (and thereby worsens the person's self-esteem), whereas a stable, high-quality relationship strengthens the perceived relational value (and thereby improves the person's self-esteem). Therefore, theory suggests that relationship quality might be a mediator of effects of beginning a relationship and marrying on self-esteem.

The Present Research

The main goal of the present research was to test whether important transitions in the domain of romantic relationships lead to changes in self-esteem (i.e., we tested for socialization effects of transitions in romantic relationships on self-esteem). We used propensity score matching to control for a wide range of confounding variables to get closer to a causal interpretation of observed socialization effects. Moreover, we investigated the time course of socialization effects in more detail, by using data from four yearly assessments of self-esteem. In addition to examining socialization effects, we also tested whether the prior level of self-esteem predicts whether these transitions in romantic relationships occur in the first place (i.e., we tested for selection effects of self-esteem on transitions in romantic relationships).

We addressed our research questions using data from a longitudinal German study, including three cohorts of late adolescents and young adults. We focused on late adolescence and young adulthood because these are important developmental periods for self-esteem development, in terms of both mean-level change and individual differences in change (Chung et al., 2014; Erol & Orth, 2011; Wagner et al., 2013). Additionally, theory suggests that finding a partner and committing to a romantic relationship is one of the central developmental tasks in late adolescence and young adulthood (e.g., Hutteman et al., 2014). Thus, socialization effects of transitions in romantic relationships might account for individual differences in self-esteem

development during late adolescence and young adulthood. Specifically, we examined the transitions of beginning a relationship, marrying, and breaking up a relationship. Although the transition of getting divorced would be of interest in this context as well, the number of participants who got divorced was not sufficiently large, so we excluded this transition from the analyses.

We expected that high self-esteem shows selection effects that are adaptive for the individual, whereas low self-esteem shows selection effects that are maladaptive. More precisely, we expected that high self-esteem predicts beginning a relationship, whereas low self-esteem predicts breaking up. Moreover, we expected that the transitions of beginning a relationship leads to an increase in self-esteem and that the transition of breaking up leads to a decrease in self-esteem. Although marrying could be considered a positive event, previous research did not consistently show adaptive effects of marrying on traits related to self-esteem (Specht et al., 2011). Thus, we did not have clear-cut hypotheses regarding the relation between marrying and self-esteem.

The present research advances the field in several ways. First, we tested for selection and socialization effects of self-esteem with regard to a comprehensive set of important transitions in romantic relationships (beginning a relationship, marrying, and breaking up a relationship). Previous research has not yet systematically examined the relation between transitions in romantic relationships and development of self-esteem. Second, we used propensity score matching to control for the confounding effects of a wide range of variables, thereby coming closer to test the causality of the observed socialization effects (Rosenbaum & Rubin, 1983). Third, we used longitudinal data across four yearly assessments to test in more detail whether socialization effects of transitions in romantic relationships are short-lived or whether they hold

at least across a period of two to three years. Fourth, we tested for the moderating effects of major demographic variables on selection and socialization effects between self-esteem and relationship transitions. Besides gender and age, we tested for moderating effects of migration background. In the domain of romantic relationships, migration background might be an important moderator because cultural contexts, as well as subcultures within countries, may vary in the importance they assign to transitions in romantic relationships such as the beginning of a new relationship and the formal transition of marriage. Moreover, when testing for the socialization effect of beginning a relationship, we tested for the moderating effect of whether it was the first romantic relationship of the participant or not. Fifth, we tested whether relationship quality mediates the effects between transitions in romantic relationships and self-esteem. For the analyses, we used measures of four indicators of relationship quality: relationship satisfaction, commitment to the relationship, intimacy, and conflict. Sixth, we used data from a very large sample ($N = 9,069$), which is important because propensity score matching requires large samples to identify well-matched treatment and control samples; moreover, the large sample size increases the precision of all other analyses in this research (e.g., the analyses of selection effects). Finally, the sample was nationally representative, significantly strengthening the validity of the conclusions.

Method

The data come from *pairfam*, release 5.0 (Nauck, Brüderl, Huinink, & Walper, 2014), which is an ongoing German panel study with a nationally representative sample of adolescents and young adults. Starting in 2008, participants have been assessed yearly for five years. The sample consists of three birth cohorts, specifically participants born in 1971–1973 (Cohort 1), 1981–1983 (Cohort 2), and 1991–1993 (Cohort 3). A detailed description of *pairfam* can be

found in Huinink et al. (2011). The present analyses are based on data from the anchor participants. In the first wave of data, self-esteem was assessed in a personal interview on the phone, whereas since the second wave self-esteem was assessed using online questionnaires (without presence of an interviewer), which likely precludes measurement invariance for the first wave. In fact, means, standard deviations, and internal consistencies for self-esteem differed strongly between the first wave and later waves. We therefore decided to examine the data from the second to fifth wave (denoted as Time 1 to Time 4 in the remainder of this article), but not from the first wave.

Participants

The sample included 9,069 participants (52% female). Table 1 shows the demographic characteristics of the full sample and separately for the three cohorts. The distribution of gender and migration background is relatively even across cohorts. Data were available for 9,069 individuals at Time 1, 7,901 individuals at Time 2 (87%), 8,037 individuals at Time 3 (89%), and 7,248 individuals at Time 4 (80%). To test for the potential impact of attrition, we compared individuals who did not participate in the last wave with those who did, on study variables at Time 1. Participants who did not participate in the last wave were more likely to have a migration background (26% vs. 20%), had lower levels of education ($M_s = 3.21$ vs. 3.35 ; $d = -0.13$), were less often involved in a romantic relationship (58% vs. 61%), less often married (27% vs. 29%), reported less neuroticism ($M_s = 2.64$ vs. 2.68 ; $d = -0.06$) and openness to experience ($M_s = 3.66$ vs. 3.69 ; $d = -0.05$) and more conscientiousness ($M_s = 3.83$ vs. 3.77 ; $d = 0.08$). Differences in gender, age, employment status, living in East versus West Germany, living with parents, sexual orientation, number of previous relationship partners, number of children, self-esteem, extraversion, and agreeableness were all nonsignificant. The finding that some attrition effects

were significant is likely related to the large sample size. Since all differences were, at most, small, nonrepresentativeness due to attrition was not a concern in this study.

Measures

Self-esteem. Self-esteem was assessed using three items, which were modeled on the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), the most frequently used and well-validated measure of self-esteem (Robins, Hendin, & Trzesniewski, 2001). One item was identical to an RSE item (“On the whole, I am satisfied with myself”) and the other two items were similar in style and content to the RSE (i.e., “I like myself just the way I am,” and “I feel worthless at times” [reverse-scored]). Responses were measured on a 5-point scale ranging from 1 (*not at all true*) to 5 (*absolutely true*). Coefficient alpha was .73 at Time 1, .76 at Time 2, .76 at Time 3, and .74 at Time 4. The correlations with the Big Five personality traits and depression were similar to findings of previous research, supporting the validity of the self-esteem scale.¹

Relationship satisfaction. Relationship satisfaction was assessed with one item (“All in all, how satisfied are you with your relationship”). Responses were measured on an 11-point scale ranging from 0 (*very dissatisfied*) to 10 (*very satisfied*).

Commitment. Commitment to the relationship was assessed with four items assessing future orientation as a couple (“I would like for our partnership to last for a long time” and “I’m counting on a long-term future together with [name of current partner]”) and tolerance of conflicts (“If our partnership no longer makes us happy, then separation from [name of current partner] would be the only way out,” [reverse-scored] and “In case of serious problems with [name of current partner], I can imagine separating” [reverse-scored]). Responses were measured on a 5-point scale ranging from 1 (*not at all*) to 5 (*absolutely*). Coefficient alpha was .68 at Time 1 and .69 at Time 2.

Intimacy. Intimacy was assessed with two items from the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985). The items were “How often do you tell [name of current partner] what you’re thinking” and “How often do you share your secrets and private feelings with [name of current partner]”. Responses were measured on a 5-point scale ranging from 1 (*never*) to 5 (*always*). Coefficient alpha was .70 at both Times 1 and 2.

Conflict. As intimacy, conflict was assessed with two items from the NRI. The items were “How often do you and [name of current partner] disagree and quarrel” and “How often are you and [name of current partner] annoyed or angry with each other”. Responses were measured on a 5-point scale ranging from 1 (*never*) to 5 (*always*). Coefficient alpha was .78 at Time 1 and .79 at Time 2.

Control variables used in the analyses of selection effects. In the analyses of selection effects, we controlled for gender, age, and migration background. Migration background was assessed as a dichotomous variable (i.e., being a first- or second-generation immigrant versus no migration background).

Control variables used in the propensity score matching analyses. A description of all variables used in the propensity score matching analyses is provided in the Appendix.

Procedure for the Statistical Analysis

Definition of transitions in romantic relationships. Transitions in romantic relationships were assessed using the following variables provided in the *pairfam* dataset: relationship status, number of previous partners, marital status, and relationship duration (in months) at the time the interviews were conducted. These variables are based on an event-history calendar including information on the relationship biography since the last interview. For each

transition, we created two groups: one group that experienced the transition (treatment group) and another group that did not experience the transition (control group).

Beginning of a relationship. Participants who reported being single at Time 1 and being in a relationship at Time 2 were compared with participants who reported being single at both Times 1 and 2. To test the longer-term effects of beginning a relationship, we conducted additional analyses. We defined the beginning of a longer relationship as starting a relationship between Times 1 and 2 and still being with the same partner at Time 3. Accordingly, we defined beginning a short relationship as starting a relationship between Times 1 and 2 and being single again at Time 3. These two groups were compared to participants who reported still being single at Time 3. For reasons of completeness, we also examined the effect of beginning a relationship between Times 1 and 2 that held until Time 4 (comparing those participants to participants who reported being single across Times 1 to 4).

Break-up of a relationship. Participants who reported being in a relationship at Time 1 and being single at Time 2 were compared with participants who reported being in the same relationship at Times 1 and 2.² To test whether the effect of experiencing a break-up depends on the duration of the relationship, we split the group of participants who experienced a break-up in two subgroups, comparing participants whose relationship had lasted already a year or longer at Time 1 with participants whose relationship had lasted less than a year at Time 1. Further, we tested whether the effect of breaking up held when participants stayed single for at least one year after the break-up. For these analyses, we split the group of participants who experienced a break-up in two groups, comparing participants who were still single at Time 3 with participants who had started a new relationship at Time 3.

Marrying. To test the unique effect of marrying (controlling for the general effect of being in a relationship), participants who became married between Times 1 and 2 were compared with participants who were in the same relationship at Times 1 and 2 but did not become married. In addition, we tested for the longer-term effect of marrying by comparing participants who became married between Times 1 and 2 and were still married at Time 3, with participants who were in the same relationship from Time 1 to Time 3 but did not become married between Times 1 and 3. Since the number of participants who became married between Times 1 and 2 and separated between Times 2 and 3 was very small, we could not test for the effects of a short marriage.

Statistical model for selection effects. To estimate selection effects of self-esteem on life transitions, we used logistic regression predicting the occurrence of transitions between Times 1 and 2 by self-esteem at Time 1, controlling for age, gender, and migration background.

Propensity score matching. To isolate socialization effects of transitions on self-esteem, we employed propensity score matching prior to performing the analyses. Propensity score matching is a method that allows controlling a large set of potentially confounding variables, thereby increasing the validity of causal conclusions from observational data (Austin, 2011; Foster, 2010; Rosenbaum & Rubin, 1983; Stuart, 2010). For the propensity score matching analyses, we used the MatchIt package for R (Ho, Imai, King, & Stuart, 2011). In propensity score matching, participants who experienced a transition are matched on their estimated propensity score to participants who did not experience a transition. The propensity score is a balance score and reflects the likelihood of an individual to experience a future event based on all scores that a person has on potentially confounding variables. By matching on the propensity score, the treatment and control groups are balanced on all confounding variables. Thus, the two

groups are similar in their propensity to experience the transition and differ only in terms of actually experiencing the transition; consequently, any differences in the outcome measure must be attributed to the occurrence of the transition.

The procedure for propensity score matching was as follows. First, we used logistic regression predicting the occurrence of a transition by self-esteem and the full set of Time 1 control variables (see Appendix). As control variables, we selected variables of the *pairfam* dataset that might influence self-esteem or the occurrence of the relationship transition. Second, to ensure that the region of overlap of the propensity score distribution between the groups—i.e., the so-called common support region—was satisfactory, all individuals whose estimated propensity score was outside of the common support region were excluded from the subsequent matching procedure (see Imai, King, & Stuart, 2008; King & Zeng, 2006). Third, based on their estimated propensity score, we matched individuals of the control group (i.e., participants who had not experienced the transition) to individuals of the treatment group (i.e., participants who had experienced the transition). Since exact matching (i.e., matching participants with the same propensity score) is often not feasible, we employed nearest-neighbor matching, in which control group participants with the most similar propensity score are matched to treatment group participants (see Austin, 2011; Ho, Imai, King, & Stuart, 2007; Ho et al., 2011; Thoemmes & Kim, 2011). We limited the possible nearest neighbor by setting the maximum caliper width to .2 (in a subset of the matching procedures, we used a smaller caliper to reduce the imbalance between the groups). To account for differences in the sample size of the treatment and control group, we used one-to-many matching (Ming & Rosenbaum, 2000; Smith, 1997; also see Ho, Imai, King, & Stuart, 2007).³ Fourth, we examined the matched samples with regard to their balance on all control variables. In case of imbalance, we repeated the matching procedure while

reducing the allowed caliper. Sample sizes of all comparisons before and after matching are shown in Table 2. Finally, in the subsequent analyses participants were weighted based on their propensity score matching weights (Ho et al., 2011).

Statistical model for socialization effects. To estimate socialization effects of transitions on self-esteem, we used weighted linear regression models. Specifically, we predicted self-esteem at Times 2 to 4 by the occurrence of the transition between Times 1 and 2, while controlling for self-esteem at Time 1.⁴

Statistical model for moderation effects. To test whether selection effects were moderated (by gender, age, and migration background), we used moderated logistic regressions, testing whether the interaction between self-esteem at Time 1 and the moderating variable explained a significant amount of variance over and above the main effects of the variables. To test whether socialization effects were moderated, we used moderated multiple regression, testing whether the interaction between the occurrence of a transition and the moderating variable explained a significant amount of variance over and above the main effects.

Mediation analyses. To test for mediation, we used a bootstrapping procedure as recommended by Preacher and Hayes (2008). Bootstrapping overcomes several weaknesses of traditional approaches (e.g., Sobel, 1982) since it respects the non-normality of the distribution of the indirect effect (Hayes, 2013). For the analyses, we used the PROCESS macro for SPSS (Hayes, 2013), with 10,000 bootstrap samples and bias-correction of the confidence interval. An effect is significant at the $p = .05$ level if 0 is not included in the 95% confidence interval.

Missing data. In the analyses of selection effects, there were no missing data for age and gender, and few missing data for migration background (2.3%) and self-esteem (0.5%). Likewise, in the propensity score matching and analyses of socialization effects, the proportion of cases

with missing data was low (ranging from 2.2% to 6.2%, depending on the specific relationship transition examined). Given that MatchIt does not allow for missing data (Ho et al., 2011) and given that the proportion of missing data was low in all analyses, we used listwise deletion to deal with missing data.

Statistical programs. The analyses of selection and socialization effects were conducted using SPSS 23. For propensity score matching, we used the R package MatchIt (Ho et al., 2011). The mediation analyses were conducted using the SPSS macro PROCESS (Hayes, 2013).

Results

Table 3 shows means and standard deviations of self-esteem for the whole sample and separately for the three cohorts. In the analyses, we used an alpha level of .05 for all tests of statistical significance unless noted otherwise.

Selection Effects

To examine selection effects of self-esteem on transitions in relationships, we tested whether self-esteem at Time 1 predicted the occurrence of the transition in the subsequent year, while controlling for the effects of gender, age, and migration background (Table 4).

Beginning of a relationship. Self-esteem showed only a marginal effect on the beginning of a relationship ($OR = 1.11, p = .06$). Next, we split the group of participants who began a relationship into two groups, comparing individuals who began a longer relationship (i.e., one that lasted at least until Time 3) and individuals who began a short relationship (i.e., one that was broken up by Time 3). Self-esteem showed a significant selection effect on the beginning of a longer relationship (specifically, high self-esteem had a positive effect; $OR = 1.34, p < .05$), whereas no significant selection effect emerged for the beginning of a short relationship ($OR = 0.94, ns$).

Break-up of a relationship. The results suggested that low self-esteem predicted breaking up in the subsequent year ($OR = 0.86, p < .05$). The selection effect of low self-esteem was stronger for individuals who experienced a break-up of a longer relationship (i.e., a relationship existed at Time 1 already for at least one year; $OR = 0.81, p < .05$) compared with individuals who experienced a short relationship (for whom the selection effect was nonsignificant; $OR = 0.94, ns$).

Marrying. Self-esteem did not have a significant selection effect on getting married ($OR = 0.99, ns$). More precisely, individuals who were in a relationship at Time 1 and became married between Times 1 and 2 did not differ in their level of self-esteem at Time 1 compared to individuals who were in a relationship at Time 1 and stayed in this relationship but did not become married.

Socialization Effects

Table 4 shows the sample sizes of the treatment and control groups before and after propensity score matching, for each of the transitions examined in the present research. In most cases, the control group (i.e., participants who did not experience the transition) was sufficiently large to find a match for almost every participant of the treatment group (i.e., participants who experienced the transition). After propensity score matching, the samples were similar on all confounding variables and self-esteem at Time 1. Thus, any existing selection effects were now eliminated, or at least strongly reduced.

Beginning of a relationship. Figure 1 shows the effects of beginning a relationship on the development of self-esteem after propensity score matching. Figure 1A illustrates that individuals who began a relationship between Times 1 and 2 experienced a significant increase in self-esteem at Time 2 compared to individuals who stayed single during this period ($d = 0.11, p <$

.05). However, at Times 3 and 4, the two groups were no longer significantly different (at Time 3, $d = -0.02$, *ns*; at Time 4, $d = 0.01$, *ns*).

Several reasons could explain why the groups did not differ at Times 3 and 4. First, the socialization effect of beginning a relationship might be transient and disappear after short intervals. Second, many participants who began a relationship between Times 1 and 2 might have experienced a relationship break-up between Times 2 and 4. Third, many participants who did not begin a relationship between Times 1 and 2 might have begun a relationship between Times 2 and 4. We therefore repeated the analysis, but now tested socialization effects only for those individuals of the treatment group who were still in the relationship at Time 3 (i.e., those who started a longer relationship), comparing them with those individuals of the control group who were still single at Time 3 (Figure 1B). Now, the socialization effect at Time 2 was larger (i.e., almost three times larger) when compared with the previous analysis ($d = 0.31$, $p < .05$). Moreover, even though the effect was only marginally significant at Time 3 ($d = 0.11$, $p = .06$), the effect was significant at Time 4 ($d = 0.16$, $p < .05$). This finding suggests that the socialization effect of beginning a longer relationship is more persistent than the more general socialization effect of beginning any relationship (regardless of whether the relationship holds at least across two years or not). For reasons of completeness, we also examined the effect of beginning a relationship that held until Time 4 (compared with staying single from Time 1 to Time 4). The results were very similar to the findings on beginning a relationship that held at least until Time 3. Participants who were still in the same relationship at Time 4 showed a similar increase in self-esteem at Time 2 after beginning the relationship ($d = 0.26$, $p < .05$) and, even though the effect was nonsignificant at Time 3 ($d = 0.07$, *ns*) the effect at Time 4 was even stronger in this group ($d = 0.24$, $p < .05$).⁵

Then, we examined the effect of beginning a short relationship (i.e., starting a relationship between Times 1 and 2 and experiencing a break-up of this relationship before Time 3 (Figure 1C). Surprisingly, the socialization effect of beginning a short relationship was almost zero at Time 2 ($d = -0.03$, *ns*). At Time 3 (i.e., after the break-up), these individuals even tended to have lower self-esteem than individuals in the control group who had been single all along ($d = -0.16$, $p = .06$). To investigate this issue more closely, we contrasted the trajectories of participants who began a longer relationship and those who began a short relationship (Figure 1D). Even though the two groups were matched at Time 1 and experienced the same event (i.e., beginning a relationship), the two groups differed significantly at all assessments after the transition (at Time 2, $d = 0.30$, $p < .05$; at Time 3, $d = 0.27$, $p < .05$; and at Time 4, $d = 0.28$, $p < .05$).

Break-up of a relationship. Figure 2 shows the effects of breaking up on the development of self-esteem after propensity score matching. Figure 2A illustrates that experiencing a relationship break-up between Times 1 and 2 had a significant impact on self-esteem at Time 2 ($d = -0.10$, $p < .05$). Individuals who experienced a break-up had a lower level of self-esteem after the transition compared to individuals who stayed in the relationship. However, this effect was only temporary. At Times 3 and 4, both groups had again a similar level of self-esteem (at Time 3, $d = 0.04$, *ns*; at Time 4, $d = -0.02$, *ns*).

The analyses reported earlier suggested that the effect of beginning a relationship differed depending on the duration of the relationship. We therefore tested whether the effect of relationship break-up differed also depending on the duration of the relationship. We distinguished between participants who experienced a break-up of a longer relationship (i.e., a relationship that had lasted for one year or longer at Time 1) versus short relationship (i.e., a relationship that had lasted for less than one year at Time 1) and then compared these groups with

participants who did not experience a break-up (Figures 2B and 2C). In both comparisons, the trajectories showed a decrease of self-esteem directly after the break-up at Time 2, followed by recovery at Times 3 and 4, similar to the initial analysis shown in Figure 2A. However, while the socialization effect of breaking up a longer relationship was larger than the initial effect ($d = -0.15, p < .05$), there was no significant socialization effect of breaking up a short relationship ($d = -0.08, ns$). To summarize, self-esteem was lower in the first year after breaking up (at least if the relationship had lasted for one year or longer), but self-esteem was recovered in the following years.

There are three reasons that could explain why self-esteem recovered one year after the break-up. First, the socialization effect of breaking up a relationship might be transient and disappear after short intervals. Second, many participants who experienced a break-up between Times 1 and 2 might have begun a new relationship between Times 2 and 3. Third, many participants who stayed in their relationship between Times 1 and 2 might have experienced a break-up between Times 2 and 3. We therefore repeated the analysis, but now tested socialization effects only for those participants of the treatment group who were still single at Time 3, comparing them to those participants of the control group who were still in the same relationship at Time 3 (Figure 2D). This comparison revealed a similar pattern of self-esteem development as the analyses reported earlier (i.e., a decrease in self-esteem directly after the break-up, followed by recovery in later years). This result indicates that the recovery of self-esteem after the initial decrease can be attributed neither to the beginning of a new relationship in participants of the treatment group nor to the experience of relationship break-up in participants of the control group. Interestingly, the initial socialization effect (i.e., the socialization effect at Time 2) of breaking up was stronger in this comparison ($d = -0.21, p < .05$).

Since the earlier analyses had shown that a break-up had the strongest impact when individuals had been in a longer relationship, we next tested whether the recovery of self-esteem at Time 3 occurred for those individuals also when they stayed single after the break-up (i.e., at least until Time 3), by comparing them to participants of the control group who were still in the same relationship at Time 3. Again, the same pattern of results emerged (Figure 2E). Although the effect of the break-up was relatively strong at Time 2 ($d = -0.33, p < .05$), the effect had disappeared at later waves (at Time 3, $d = -0.09, ns$; at Time 4, $d = -0.12, ns$). Nevertheless, both Figure 2D and Figure 2E show that those participants who stayed single for at least another year after a relationship break-up experienced the strongest drop in self-esteem.

Marrying. Figure 3 shows the effect of getting married on the development of self-esteem after propensity score matching. Figure 3A illustrates that marrying between Times 1 and 2 had no impact on self-esteem at Times 2 to 4 (at Time 2, $d = 0.02, ns$, at Time 3, $d = -0.06, ns$, at Time 4, $d = -0.09, ns$). In addition, we compared those participants of the treatment group who remained married at least until Time 3 with those participants of the control group who stayed in the same relationship from Times 1 to 3 but did not get married during this period (Figure 3B). Again, the effect of marrying was nonsignificant (for Time 2, $d = 0.02, ns$, for Time 3, $d = -0.12, ns$, for Time 4, $d = -0.13, ns$).

Moderation Analyses

Next, we tested for all of the selection and socialization effects reported above whether they were moderated by gender, age, and migration background. Moreover, since previous research had investigated the effect of beginning the first romantic relationship (e.g., Neyer & Lehnart, 2007) we also tested whether the socialization effect of beginning a relationship differed depending on whether it was the first relationship of the participant or not. Because of the large

number of moderation tests (specifically, we conducted 33 tests for selection effects and 37 tests for socialization effects) and because most of these tests were exploratory, we used a more conservative significance level for the moderation analyses ($p < .01$). No significant moderation effects emerged.

Mediation Analyses

Our last goal was to test whether relationship quality mediates the effects between transitions in romantic relationships and self-esteem (e.g., Karney & Bradbury, 1997; Neyer & Asendorpf, 2001; Orth et al., 2012). We used four indicators of relationship quality: relationship satisfaction, commitment, conflict, and intimacy. For each mediation analysis, we first examined the four indicators of relationship quality in separate models (simple mediation models, see Figures 4A and 4B) and then tested the mediation effects of all four indicators simultaneously, thereby mutually controlling the effects (multiple mediation models, see Figures 4C and 4D).

With regard to selection effects, relationship quality is a possible mediator among those participants who are in a relationship at Time 1 and experience the transitions of marriage or relationship break-up between Times 1 and 2.⁶ The results of the analyses are shown in Table 5. For break-up, the simple mediation analyses suggested that all four indicators of relationship quality mediate the selection effect of self-esteem. When all indicators were included in the same model, the mediation effects of relationship satisfaction and commitment held, whereas the effects of intimacy and conflict became nonsignificant. In all mediation models, the direct effect of self-esteem on break-up was no longer significant. When we repeated these analyses for participants who experienced the break-up of a longer or a short relationship, the pattern of results was essentially the same, except that commitment was not a mediator among participants who experienced the break-up of a short relationship (Table 5). Even though the selection effect

of self-esteem on marrying was nonsignificant, we tested for mediation of this effect because mediation can occur even if the total effect is nonsignificant, e.g., when the total effect is small and in suppressor situations (e.g., MacKinnon & Fairchild, 2009; MacKinnon, Fairchild, & Fritz, 2007; Shrout & Bolger, 2002). Thus, for reasons of completeness, we tested for mediation of the effect of self-esteem also on marrying. Interestingly, a significant indirect effect emerged for relationship satisfaction and commitment, suggesting that self-esteem has a positive indirect effect on marrying through its effect on relationship quality, whereas the direct effect of self-esteem is negative (i.e., predicting a lower likelihood of marriage) when the self-esteem effect on relationship quality is controlled for.⁷

Although it is not meaningful to test whether relationship quality mediates the selection effect of self-esteem on beginning a relationship because participants are not yet in the relationship at Time 1, the results on beginning a longer versus shorter relationship suggest that self-esteem might show divergent selection effects on beginning a high-quality versus low-quality relationship. Therefore, we tested whether the selection effect differed between participants who began a high-quality relationship, participants who began a low-quality relationship, and participants who stayed single between Times 1 and 2. For constructing groups of participants with high-quality versus low-quality relationships, we converted the four relationship quality indicators to *z*-scores and aggregated them into one variable by averaging across indicators (coefficient alpha = .66). We used the median of the aggregate variable as cut-off value for constructing groups of participants who began a high-quality versus low-quality relationship. To test for selection effects, we used the same method as in the analyses of selection effects reported above. The results indicated that self-esteem showed a significant selection effect on the beginning of a high-quality relationship, both compared to beginning a low-quality

relationship ($OR = 1.47, p < .05$) and compared to participants who stayed single ($OR = 1.32, p < .05$). However, no significant selection effect emerged when comparing participants who began a low-quality relationship and participants who stayed single ($OR = 0.91, ns$).

With regard to socialization effects, relationship quality is a possible mediator among those participants who experienced a transition between Times 1 and 2 and who are in a relationship at Time 2; more precisely, those participants who began a relationship or who married between Times 1 and 2.⁸ The results of the analyses are shown in Table 6. When contrasting participants who began a longer versus short relationship, the simple mediation analyses suggested that relationship satisfaction and conflict mediated the socialization effect of self-esteem. When all indicators were included in the same model, the mediation effect of conflict held, whereas the effect of relationship satisfaction became nonsignificant. Moreover, in these models, the direct effects were significant and larger than the indirect effects. Thus, the results suggest that the mediation effect of relationship quality accounted only partially for the difference between the socialization effects of beginning a longer versus short relationship. Again, even though the socialization effect of marrying on self-esteem was nonsignificant, we tested for mediation of this effect for reasons of completeness. In the simple mediation models, significant effects emerged for relationship satisfaction and conflict. In the multiple mediation model, the effect of conflict held, whereas the effect of relationship satisfaction became nonsignificant. Overall, however, the results suggested that both the indirect and direct socialization effect of marrying on self-esteem was small.

With the typical approach to test for mediation it is not possible to test whether relationship quality mediates the socialization effect of beginning a new relationship (i.e., comparing participants who began a relationship with those who stayed single) because measures

of relationship quality are not applicable to the situation of singles. Therefore, we employed a different approach to test whether the socialization effect of beginning a new relationship on self-esteem is driven by beginning a high-quality relationship. Specifically, we tested whether relationship quality added significantly to the prediction of self-esteem at Time 2 over and above the effect of beginning a new relationship. Using a moderated regression model, we predicted self-esteem at Time 2 by the occurrence of beginning a relationship between Times 1 and 2 (controlling for self-esteem at Time 1) and added the interaction term of beginning a relationship and relationship quality. To avoid multicollinearity between indicators of relationship quality, we used the aggregate variable of relationship quality described in the previous section. The results indicated that relationship quality had an independent effect on self-esteem ($\beta = .07, p < .05$) over and above the effect of beginning a romantic relationship ($\beta = .05, p < .05$). The results suggest that both the beginning of a romantic relationship and the quality of this relationship have an effect on self-esteem (see Figure 5).

Analyses on Serial Monogamists

The finding that both the beginning and the break-up of a relationship have an effect on self-esteem raises the question of how self-esteem develops among individuals who experience both types of transitions within short periods (i.e., serial monogamists). For the analyses, we operationalized serial monogamists as the group of participants who experienced both the break-up of a relationship and the beginning of a new relationship between Times 1 and 2. The sample size of this group was 186 before matching and ranged from 180 to 183 after matching (depending on the specific comparison group used in the analysis). Serial monogamists were compared with four other groups: individuals who stayed single from Time 1 to Time 2; individuals who stayed in the same relationship from Time 1 to Time 2; individuals who

experienced the beginning of a relationship within this period and were still in this relationship at Time 2; and individuals who experienced the break-up of a relationship within this period and were still single at Time 2. No significant selection or socialization effects emerged (Table 7), suggesting that the effects among serial monogamists did not differ significantly from the comparison groups.

Discussion

In this research, we tested whether self-esteem predicts the occurrence of important transitions in romantic relationships (i.e., selection effects) and whether transitions in romantic relationships predict changes in self-esteem (i.e., socialization effects). For the analyses, we used longitudinal data from a large sample of three cohorts of late adolescents and young adults, who were assessed four times across a three-year period. The results suggested that self-esteem has selection effects on some but not all relationship transitions. Participants who had high self-esteem at the beginning of the study and were single had a higher probability of beginning a high-quality relationship that held at least for one year. Participants who had high self-esteem at the beginning of the study and were in a relationship had a lower probability of experiencing relationship break-up. This effect was mediated by relationship quality. However, self-esteem did not have a direct selection effect on marrying, but there was an indirect effect through relationship quality. For the analyses of socialization effects, we used propensity score matching, which strengthens the validity of causal conclusions. Using matched samples, the results showed that beginning a relationship increased self-esteem and that the increase persisted when the relationship held at least for one year. The different effects of beginning a longer versus a short relationship on self-esteem were partially mediated by relationship quality. Experiencing a relationship break-up decreased self-esteem, but the effect disappeared after one year, even if the

participant stayed single. Marrying did not directly influence self-esteem, but had an indirect effect through relationship quality. All findings held across gender, age, and migration background. In the following sections, we discuss these results in more detail.

Selection Effects of Self-Esteem on Relationship Transitions

Does a person's level of self-esteem influence whether he or she finds a partner and begins a romantic relationship? Whereas the selection effect on beginning any romantic relationship was nonsignificant, the effect was significant when romantic relationships were limited to relationships that lasted at least for one year. The effect held when we contrasted participants who began a longer versus short relationship. Thus, the results suggest that high self-esteem selects for finding a partner with whom the person maintains a more stable, and potentially more satisfying, romantic relationship. This was supported by further analyses suggesting that self-esteem selects for the beginning of a high-quality relationship but not for the beginning of a low-quality relationship. Several processes could explain this effect. First, individuals with high self-esteem might be more competent in choosing the right kind of person with whom they can have a satisfying relationship and, accordingly, in refusing to begin a relationship with individuals with whom a relationship might be conflict-laden and short-lived. Second, individuals with high self-esteem might be more attractive mates than individuals with low self-esteem, so that they might be able to choose from a larger pool of potential partners. Third, once individuals with high self-esteem begin a relationship, they might show more competent relationship behavior, increasing the satisfaction of both partners and contributing to a longer relationship duration (Murray et al., 2003; Murray et al., 1996a, 1996b; Murray et al., 2002). Although previous research on the selection effect of self-esteem on beginning a relationship did not report significant findings (Neyer & Asendorpf, 2001; Neyer & Lehnart,

2007; Wagner, Becker, et al., 2015), these studies did neither distinguish between shorter versus longer relationships nor between high-quality versus low-quality relationships. Thus, the present research suggests that self-esteem makes a difference with regard to finding a romantic relationship partner. However, it indicates that the effect needs to be examined in a more fine-grained way.

With regard to breaking up a romantic relationship, self-esteem showed significant selection effects as well. Participants who were in a relationship at the beginning of the study and had a lower level of self-esteem were more likely to experience relationship break-up. Moreover, the selection effect of self-esteem was stronger with regard to experiencing the break-up of a relationship that had lasted already for at least one year. These results are in line with the findings on beginning a relationship discussed in the previous paragraph: the selection effect of self-esteem on relationship transitions is stronger when focusing on relationships that hold across longer periods and, presumably, are more satisfying and fulfilling. We discuss this in more detail below in the section on mediation analyses.

The results further suggested that self-esteem does not select for becoming married. However, it is important to keep in mind that—since we were interested in the unique effect on marrying, which should be controlled for the effect of self-esteem on beginning a relationship—we compared participants who were in a relationship at the first assessment and then married their partner (i.e., the treatment group) with participants who also were in a relationship at the first assessment and stayed in this relationship but did not marry their partner (i.e., the control group). Thus, whereas self-esteem selects for beginning a longer relationship (as discussed earlier), the results indicate that, for individuals who are in a romantic relationship, self-esteem does not predict whether a person gets married or not.

On a more general note, the present findings suggest that the occurrence of important transitions in romantic relationships is not independent of an individual's level of self-esteem, which is consistent with findings on other personality characteristics such as the Big Five personality traits (Headey & Wearing, 1989; Kandler et al., 2012; Lüdtke et al., 2011; Magnus et al., 1993; Vaidya et al., 2002). Thus, self-esteem is not merely an outcome of a person's life circumstances, but influences which environments a person selects (cf. Caspi et al., 2005; Roberts et al., 2008). The present results clearly suggest that the selection effects of self-esteem on transitions in romantic relationships are adaptive, given that individuals with high self-esteem were more likely to begin a longer romantic relationship and less likely to experience relationship break-up. These findings correspond to evidence from other longitudinal studies, which suggested that self-esteem contributes to success and well-being in important life domains such as relationships, work, and health (Kuster et al., 2013; Marshall et al., 2014; Orth et al., 2012; Trzesniewski et al., 2006; for a review see Orth & Robins, 2014). The positive effects of self-esteem on the relationship domain are relevant given that romantic relationships are not only a potential source of well-being and life satisfaction, but frequently entail a number of other important consequences such as the possibility to start a family and the availability of social and material support (Dush & Amato, 2005; Sedikides, Oliver, & Campbell, 1994).

Socialization Effects of Relationship Transitions on Self-Esteem

Does the beginning of a romantic relationship enhance a person's self-esteem? Whereas the socialization effect of the beginning of any romantic relationship on self-esteem was nonsignificant, the effect was significant for romantic relationships that held at least for one year. Thus, the findings suggest that beginning a longer, more stable, and potentially more satisfying relationship leads to an increase in self-esteem. In contrast, beginning a short relationship even

led to a decrease in self-esteem. One factor that could explain these divergent trajectories is relationship quality that we discuss in more detail below.

Relationship break-up showed significant socialization effects on self-esteem as well. Participants who experienced relationship break-up showed a decrease in self-esteem. Moreover, the socialization effect on self-esteem was stronger for participants who experienced the break-up of a relationship that had lasted for at least one year compared to the break-up of a shorter relationship. These results are in line with the findings of beginning a relationship discussed in the previous paragraph: the socialization effect of relationship transitions on self-esteem was stronger when focusing on relationships that hold across longer periods. Participants might interpret a relationship break-up as a setback with respect to making progress towards their ideal self and, thus, suffer loss in self-esteem. This could explain why participants who experienced the break-up of a longer relationship showed stronger decreases in self-esteem. It is possible that they invested more of their hopes and dreams in the relationship and felt already closer to their goal of having a committed and lasting romantic relationship. Consequently, these participants might have felt a greater sense of setback than participants who experienced the break-up of a shorter relationship. Although a previous study on the socialization effect of relationship break-up on self-esteem did not report significant findings (Neyer & Asendorpf, 2001), that study did not distinguish between shorter and longer relationships. Moreover, the present findings suggest that the decrease in self-esteem after a relationship break-up is only temporary and that the person's self-esteem is recovered already one year later. Thus, although research on many psychological phenomena suggests that "bad is stronger than good" (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001, p.323)—that is, the effects of negative events, negative interactions, and negative emotions are often stronger than the effects of positive events, positive interactions, and positive

emotions—in the present research the effect of beginning a relationship (i.e., a positive transition) was more sustained than the effect of relationship break-up (i.e., a negative transition).

The temporary effect of relationship break-up, however, is not surprising. Even though relationship break-ups are painful, people tend to recover from them and move on. Especially in adolescence and young adulthood, when individuals are dating, have their first romantic relationship, try different types of relationships, and search the right partner to spend their life with, relationship break-ups are not unusual and, thus, normative. Studies suggest that relationship break-ups do not only have negative effects on an individual's subjective well-being but may also initiate personal growth (e.g., Hebert & Popadiuk, 2008; Tashiro & Frazier, 2003). The results of these studies suggest that individuals tend to report positive changes after experiencing relationship break-up, such as gaining inner strength and maturity, and report having learned important lessons that will be useful in future relationships. Thus, people's initial reactions to relationship break-up and rejection might be negative and result in decreases in self-esteem. However, when moving on after the break-up individuals might become aware of positive changes and personal growth resulting from the break-up, which might increase their self-esteem. Moreover, the stress and coping literature emphasizes the importance of resilience and hedonic adaptation after negative life events (e.g., Bonanno, 2004; Wilson & Gilbert, 2008). The present findings are in line with research suggesting that most individuals' well-being tends to recover after negative life events, including divorce (e.g., Luhmann et al., 2012; Mancini, Bonanno, & Clark, 2011). A recent meta-analytic study by Luhmann et al. (2012) even suggested that after getting divorced individuals' subjective well-being shows only mild decreases before actually increasing.

However, the findings suggested that marrying has no socialization effect on self-esteem. Although at first sight this finding might be surprising, several processes could explain this finding. First, people's self-esteem might already increase in anticipation of getting married well before the wedding actually takes place. Frequently, the transition into marriage is planned several months or even more than a year in advance (cf. Luhmann et al., 2014). Thus, it is possible that changes in self-esteem that are related to getting married occur long before the actual transition into marriage. Second, remember that this effect is the unique effect of marrying, which is controlled for the effect of beginning a relationship. Thus, the results indicate that whereas beginning a longer relationship leads to an increase in self-esteem (as discussed earlier), for individuals who are already in a romantic relationship getting married has no additional benefit on self-esteem. Thus, the results suggest that the beginning of a relationship rather than getting married promotes self-esteem in late adolescence and young adulthood.

More generally, although the effect sizes tended to be small (Cohen, 1988), the present results suggest that transitions in romantic relationships influence an individual's level of self-esteem. Although this is consistent with theoretical perspectives on self-esteem (e.g., Harter, 2012; Leary, 2012), the present findings are important because as yet longitudinal evidence on the potential causes of self-esteem development is still limited (see Orth & Robins, 2014). Whereas there is strong evidence that self-esteem influences important outcomes in the relationship, work, and health domain, in previous research the effects in the reverse direction—i.e., the prospective effects of relationship, work, and health outcomes on self-esteem—were often very small or nonexistent (Orth & Robins, 2014). The present findings suggest that self-esteem is influenced by romantic relationships and, importantly, these effects were controlled for a wide range of confounding variables by using propensity score matching.

The present research suggests that the relation between self-esteem and transitions in romantic relationships involves both selection and socialization effects. Many of our results follow the corresponsive principle of personality development that states that life experiences deepen the characteristics of a person that lead to the experience in the first place (Roberts et al., 2008; for empirical studies, see Lüdtke et al., 2011; Robins, Caspi, & Moffitt, 2002; Sutin, Costa, Wethington, & Eaton, 2010). Specifically, high self-esteem predicted the beginning of a longer relationship, which in turn further increased the person's self-esteem. In addition, low self-esteem predicted relationship break-up, which in turn decreased the person's self-esteem. However, while the socialization effect of beginning a relationship held at least across two or three years (i.e., the study period), the effect of breaking up was not persistent and disappeared one year after the break-up even when the participant stayed single after the break-up. Thus, the effect of relationship break-up supports the dynamic equilibrium model (or set point model) of personality development, which posits that personality traits change only temporarily in response to major life experiences, but then return to a genetically influenced person-specific set point (cf. Specht et al. 2014; Ormel, Riese, & Rosmalen, 2012; see also Fraley & Roberts, 2005; Luhmann et al., 2014).

Mediation Effects of Relationship Quality

In the present research, we also tackled the question of which mechanisms account for selection and socialization effects between self-esteem and transitions in romantic relationships, by testing whether relationship quality mediates the effects. For the analyses, we used four indicators of relationship quality (i.e., relationship satisfaction, commitment to the relationship, intimacy, and conflict). Although the results for specific effects differed with regard to which indicator of relationship quality showed the strongest mediation effect (for example, the selection

effects were predominantly mediated by relationship satisfaction and commitment), the important point in this context is that in all tests conducted indicators of relationship quality at least partially mediated the effects.

The finding that relationship quality mediates the selection effects of self-esteem on relationship transitions is in line with previous research indicating that self-esteem prospectively predicts relationship quality (e.g., Neyer & Asendorpf, 2001; Orth et al., 2012) and that relationship quality is a key factor for relationship continuation (Hendrick, 1988; Hendrick et al., 1988; Karney & Bradbury, 1997). Research suggests that individuals with high self-esteem show more constructive relationship behavior, which reduces the likelihood of conflicts and break-up (Murray et al., 1996a, 1996b). In contrast, individuals with low self-esteem tend to show problematic behaviors such as excessive reassurance seeking, interpret ambiguous behavior of their partners negatively, and reduce closeness to the partner in times of relationship conflict (Joiner et al., 1999; Murray et al., 2000; Murray et al., 2002). Thus, the present findings suggest that these processes might explain why individuals with low self-esteem have a larger risk of experiencing relationship break-up.

With regard to socialization effects, the findings suggest that relationship quality mediated the divergent effects of beginning a longer versus a short relationship (on average, individuals who began a longer relationship experienced an increase in self-esteem, whereas individuals who began a short relationship experienced a decrease in self-esteem). Furthermore, the results showed that relationship quality moderated the effect of beginning a relationship on self-esteem. Even though the main effect of beginning a relationship on self-esteem remained significant, the results indicated that beginning a low-quality relationship has no effect on self-esteem whereas beginning a high-quality relationship has a larger effect. Thus, the present results support the

notion that beginning a relationship improves self-esteem if and only if the relationship is well-functioning, stable, and holds at least for a certain period (in the present research, this period was operationalized as one year or longer). Moreover, even though the total effect of marrying on self-esteem was nonsignificant, marrying had a positive indirect effect on self-esteem through a low level of conflict. These findings are consistent with previous research showing that low-quality relationships in young adulthood lead to increases in negative emotionality (Robins et al., 2002). Moreover, the findings are consistent with sociometer theory, which posits that self-esteem reflects a person's relational value as subjectively perceived by the person him- or herself (Leary, 2012; Leary & Baumeister, 2000). It is well conceivable that an unstable conflict-laden romantic relationship worsens the perceived relational value, whereas a stable, harmonious relationship increases the perceived relational value. However, it should be noted that relationship quality only partially mediated the socialization effects of relationship transitions. Future research should therefore test for additional mechanisms that could explain why self-esteem increases after beginning a longer relationship.

Limitations and Future Directions

One limitation of the present study is that we could not examine the relationship transition of getting divorced because of the small number of participants who experienced this transition—a limitation related to the fact that the sample covered the developmental periods of late adolescence and young adulthood. Since divorce clearly is a central, and potentially impactful, transition, future research should seek to test for selection and socialization effects in the relation between self-esteem and getting divorced. In addition, even though the sample allowed testing for the effects of getting married, the number of participants who became married during the study period was relatively small compared to the two other transitions tested. Nevertheless, we note

that, overall, the large size of the sample examined in the analyses is an important strength of the present research.

As mentioned earlier, the present sample covered late adolescence and young adulthood. Therefore, future research should replicate the present findings with samples that include additional age groups such as middle adulthood and old age. Given that the central developmental tasks in the relationship domain systematically change across the life course (Hutteman et al., 2014), it is possible that the pattern of selection and socialization effects between self-esteem and relationship transitions changes across the life span. For example, whereas finding a partner and beginning a committed relationship is an important developmental task in young adulthood, during middle adulthood the focus shifts to maintaining a satisfying relationship with the partner. Moreover, in old age, frequently an important task is to deal with the death of a spouse and to adjust to widowhood (Hutteman et al., 2014). In addition, it is possible that effects of relationship transitions on self-esteem are smaller in middle adulthood than in young adulthood, because middle-aged adults have developed a clearer self-concept (Lodi-Smith & Roberts, 2010) and more stable and less contingent self-esteem (Crocker & Wolfe, 2001; Meier, Orth, Denissen, & Kühnel, 2011), which might help to cope with relationship break-up and avoid loss in self-esteem.

Given that the present research used data from a German sample, future research should examine the link between relationship transitions and self-esteem development in samples from other, particularly non-Western, cultural contexts (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010). For example, research suggests that people from Asian cultures, compared to Western countries, are characterized by a lower need for self-esteem and a stronger centrality of relationships for their self-concept (Heine, Lehman, Markus, & Kitayama, 1999; Markus &

Kitayama, 1991), which may influence selection and socialization effects between self-esteem and relationship transitions. Moreover, given that cultures differ in the importance assigned to the formal recognition of a romantic relationship through marriage and, correspondingly, in the negative evaluation of not being married (which might be even seen as stigma), selection and socialization effects for becoming married—which were nonsignificant in the present research—might differ across cultural contexts (Diener et al., 2000; Gibbs, 1969; Levine, Sato, Hashimoto, & Verma, 1995). For example, in contemporary Western cultures, people might derive self-esteem from being in a stable committed relationship with a loving partner, but might feel a lesser need for formal confirmation of their partner’s love through marriage, at least as regards their self-esteem. Nevertheless, we note that the moderator effect of migration background on the effects of relationship transitions was nonsignificant. Under the assumption that a significant proportion of participants with migration background had been influenced by cultures that value marriage more strongly than the German cultural context, the present research provides a first step toward establishing the cross-cultural generalizability of the results.

An important strength of the present research is the use of a large and nationally representative sample, which increases the robustness and generalizability of the findings. Also, the use of four repeated assessments allowed for a detailed investigation of the self-esteem trajectories after relationship transitions (i.e., to uncover the time course of socialization effects) and, moreover, allowed to test for differing effects of short-lived versus longer relationships. Moreover, an important strength is the use of propensity score matching to control for a large set of variables in the socialization effects analyses, which increases the validity of the findings and strengthens confidence in causal conclusions.

In conclusion, the present study improves the understanding of factors that influence self-esteem development, by providing evidence on selection and socialization effects with regard to transitions in romantic relationships and evidence on the mediating effects of relationship quality. The findings suggest that beginning a relationship (i.e., the transition into the social role of being a partner) rather than getting married (i.e., the transition into the formal role of being a spouse) promotes self-esteem in late adolescents and young adults. Thus, the present research contributes to the explanation of normative age trends in these developmental periods. Moreover, given that individuals who did versus did not experience a relationship transition showed different trajectories, the present research contributes also to the explanation of individual differences in self-esteem development. The findings have significant implications because they suggest that self-esteem influences whether important transitions occur in the relationship domain and that, in turn, experiencing these transitions influences the further development of self-esteem.

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Footnotes

¹ The correlations of the self-esteem scale with the Big Five personality traits at Time 1 were -.48 for neuroticism, .24 for extraversion, .15 for agreeableness, .21 for conscientiousness, and .04 for openness, similar to findings in previous research (e.g., Erdle et al., 2009; Robins et al., 2001). The correlation of self-esteem with depression was -.56, similar to a meta-analytic estimate (e.g., Sowislo & Orth, 2013).

² To ensure that only those participants were compared who had been in a relationship for about the same length, we included duration of the current relationship as a control variable in the propensity score matching procedure. For the same reason, we included duration of the current relationship as a control variable in the matching procedure for marrying.

³ In one analysis, the control group was larger than the treatment group (i.e., beginning of a longer vs. short relationship). In this situation, we used matching with replacement instead of one-to-many matching (Dehejia & Wahba, 1999; also see Ho et al., 2007).

⁴ In the regression analyses on socialization effects, we did not control for the same variables that were controlled when examining selection effects (i.e., gender, age, migration background), since they have been already controlled for through propensity score matching. However, as is typically done when using propensity score matching, we controlled for the prior level of the outcome (i.e., Time 1 level of self-esteem) because small differences between the groups can occur even after propensity score matching.

⁵ The nonsignificant effect at Time 3 could be attributed to two factors, namely, the smaller sample size of participants who stayed in their relationship until Time 4 ($N = 205$ before matching and $N = 199$ after matching) and strong fluctuations in self-esteem in the matched group of singles.

⁶ In contrast to the transitions of marriage and break-up, it is not meaningful to test whether relationship quality mediates the selection effect of self-esteem on beginning a relationship because participants are not yet in the relationship at Time 1.

⁷ For reasons of completeness, we also tested the other causal pathway, that is, whether self-esteem mediates the effect of relationship quality on relationship transitions (i.e., break-up and marrying). Although we hypothesized that relationship quality mediates the effects of self-esteem on relationship transitions, it might be possible that, for example, a high-quality relationship results in marrying, because, in part, it boosts the partners' self-esteem. However, the results showed that none of the effects of relationship quality on break-up (i.e., break-up overall, break-up of a long relationship and break-up of a short relationship) and marrying was mediated by self-esteem.

⁸ In contrast to the transitions of beginning a relationship and marriage, it is not meaningful to test whether relationship quality mediates the socialization effect of relationship break-up on self-esteem because participants are not anymore in the relationship at Time 2. Moreover, it is not possible to test whether relationship quality mediates the effect when comparing participants who began a relationship with those who stayed singles, because singles cannot report on relationship quality.

Table 1

Demographic Characteristics of the Sample

Sample	N	<i>Female</i>	<i>Mean age (and SD)</i>	<i>Migration background</i>
		<i>(proportion)</i>	<i>at Time 1</i>	<i>(proportion)</i>
Cohort 1	2,893	.56	37.2 (0.9)	.23
Cohort 2	2,621	.51	27.1 (0.9)	.23
Cohort 3	3,555	.49	17.0 (0.9)	.21
Full sample	9,069	.52	26.4 (8.5)	.22

Table 2

Sample Sizes of Treatment and Control Groups Before and After Propensity Score Matching

Relationship transition	Before propensity score matching		After propensity score matching	
	Treatment group	Control group	Treatment group	Control group
Beginning of a relationship				
Beginning of a relationship	689	2,175	685	1,323
Beginning of a longer relationship	322	1,286	318	613
Beginning of a short relationship	180	1,286	177	346
Beginning of a longer vs. short relationship	322	180	279	115
Break-up of a relationship				
Break-up of a relationship	488	3,345	462	786
Break-up of a longer relationship	213	2,942	204	388
Break-up of a short relationship	275	403	245	341
Break-up of a relationship and staying single	240	2,684	230	413
Break-up of a longer relationship and staying single	99	2,432	93	178
Marrying				
Marrying	133	1,405	127	251
Marrying and staying married	112	904	110	218

Table 3

Means and Standard Deviations of Self-Esteem Across Assessments

Sample	Time 1		Time 2		Time 3		Time 4	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Cohort 1	3.87	0.87	3.90	0.86	3.87	0.85	3.87	0.81
Cohort 2	3.91	0.87	3.89	0.86	3.87	0.85	3.89	0.81
Cohort 3	3.99	0.83	3.96	0.84	3.96	0.82	3.92	0.84
Full sample	3.93	0.86	3.92	0.86	3.90	0.84	3.90	0.82

Note. The response scale ranged from 1 to 5.

Table 4

Selection and Socialization Effects Between Self-Esteem and Relationship Transitions

Relationship transition	Selection effect of self-esteem on relationship transition		Socialization effect of relationship transition on self-esteem*					
	<i>Odds Ratio</i>	<i>p</i>	Time 2		Time 3		Time 4	
			<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>
Beginning of a relationship								
Beginning of a relationship	1.11	.064	0.11*	.004	-0.02	.593	-0.01	.963
Beginning of a longer relationship	1.34*	.003	0.31*	.000	0.11	.061	0.16*	.022
Beginning of a short relationship	0.94	.529	-0.03	.672	-0.16	.057	-0.03	.753
Beginning of a longer vs. short relationship	1.37*	.010	0.30*	.003	0.27*	.008	0.28*	.013
Break-up of a relationship								
Break-up of a relationship	0.86*	.020	-0.10*	.027	0.04	.535	-0.02	.592
Break-up of a longer relationship	0.81*	.014	-0.15*	.032	0.04	.490	0.00	.869
Break-up of a short relationship	0.94	.543	-0.09	.243	0.03	.867	-0.03	.488
Break-up of a relationship and staying single	0.86	.104	-0.21*	.004	-0.05	.654	-0.08	.494
Break-up of a longer relationship and staying single	0.79	.067	-0.33*	.003	-0.09	.502	-0.13	.446
Marrying								
Marrying	0.99	.899	0.02	.858	-0.06	.575	-0.09	.223
Marrying and staying married	0.98	.840	0.02	.669	-0.12	.309	-0.13	.320

* $p < .05$.

Table 5

Direct and Indirect Effects of Self-Esteem at Time 1 on Transitions in Romantic Relationships

Outcome	Mediator	Simple mediation models				Multiple mediation models			
		Indirect effect		Direct effect		Indirect effect		Direct effect	
		<i>ab</i>	95% CI	<i>c'</i>	95% CI	<i>ab</i>	95% CI	<i>c'</i>	95% CI
Break-up of a relationship	Satisfaction	-.12*	[-.154, -.088]	-.04	[-.173, .087]	-.07*	[-.108, -.044]		
	Commitment	-.09*	[-.121, -.063]	-.05	[-.181, .080]	-.07*	[-.101, -.048]		
	Intimacy	-.06*	[-.091, -.040]	-.08	[-.212, .043]	-.01	[-.037, .100]		
	Conflict	-.03*	[-.061, -.004]	-.12	[-.248, .008]	.03	[-.002, .062]		
	Sum of mediators					-.13*	[-.177, -.085]	-.03	[-.162, .111]
Break-up of a longer relationship	Satisfaction	-.12*	[-.168, -.085]	-.09	[-.264, .092]	-.07*	[-.113, -.027]		
	Commitment	-.10*	[-.141, -.067]	-.07	[-.245, .113]	-.08*	[-.117, -.049]		
	Intimacy	-.06*	[-.101, -.029]	-.14	[-.316, .034]	-.00	[-.039, .031]		
	Conflict	-.09*	[-.137, -.044]	-.10	[-.282, .078]	-.01	[-.061, .040]		
	Sum of mediators					-.16*	[-.223, -.103]	-.03	[-.221, .154]
Break-up of a short relationship	Satisfaction	-.08*	[-.144, -.034]	.01	[-.198, .208]	-.05*	[-.106, -.017]		
	Commitment	-.04	[-.106, .014]	-.04	[-.237, .166]	-.02	[-.074, .023]		
	Intimacy	-.03*	[-.085, -.001]	-.02	[-.221, .176]	-.01	[-.049, .005]		
	Conflict	-.02*	[-.060, -.001]	-.06	[-.253, .138]	-.00	[-.026, .023]		
	Sum of mediators					-.08*	[-.162, -.006]	.02	[-.191, -.230]
Marrying	Satisfaction	.06*	[.002, .149]	-.08	[-.305, .136]	.02	[-.041, .095]		
	Commitment	.12*	[.075, .193]	-.12	[-.337, .097]	.12*	[.071, .198]		
	Intimacy	.01	[-.016, .053]	-.04	[-.253, .180]	-.02	[-.064, .012]		
	Conflict	.04	[-.006, .090]	-.06	[-.278, .160]	.01	[-.038, .064]		
	Sum of mediators					.13*	[.052, .205]	-.12	[-.346, .098]

Note. In the simple mediation models, for each outcome variable the results of four separate models are presented. In the multiple mediation models, for each outcome variable the results of one CI model including all four CI mediators are presented. The confidence intervals (CI) were computed using bootstrapping with 10,000 replications. *ab* denotes the indirect effect, that is, the product of the path *a* from self-esteem to the mediator and the path *b* from the mediator to the outcome (see Figure 4). *c'* denotes the direct path from self-esteem to the outcome variable controlling for the indirect paths included in the model.

* $p < .05$.

Table 6

Indirect and Direct Effects of Transitions in Romantic Relationships on Self-Esteem at Time 2

Predictor	Mediator	Simple mediation models				Multiple mediation models			
		Indirect effect		Direct effect		Indirect effect		Direct effect	
		<i>ab</i>	95% CI	<i>c'</i>	95% CI	<i>ab</i>	95% CI	<i>c'</i>	95% CI
Beginning of a longer vs. short relationship	Satisfaction	.02*	[.003, .101]	.21*	[.059, .355]	.01	[-.005, .055]		
	Commitment	.01	[-.010, .039]	.23*	[.076, .374]	-.01	[-.036, .013]		
	Intimacy	.02	[-.003, .056]	.21*	[.061, .361]	.01	[-.010, .048]		
	Conflict	.03*	[.007, .081]	.19*	[.047, .341]	.03*	[.004, .077]		
	Sum of mediators					.05*	[.006, .110]	.17*	[.022, .322]
Marrying	Satisfaction	.04*	[.011, .082]	-.02	[-.166, .126]	.03	[-.005, .078]		
	Commitment	.03	[-.016, .078]	-.01	[-.166, .139]	-.00	[-.050, .045]		
	Intimacy	.00	[-.018, .019]	.02	[-.132, .163]	-.01	[-.037, .005]		
	Conflict	.03*	[.004, .068]	-.01	[-.157, .133]	.02*	[.002, .063]		
	Sum of mediators					.05	[-.009, .103]	-.03	[-.177, .124]

Note. In the simple mediation models, for each outcome variable the results of four separate models are presented. In the multiple mediation models, for each outcome variable the results of one model including all four mediators are presented. The confidence intervals (CI) were computed using bootstrapping with 10,000 replications. *ab* denotes the indirect effect, that is, it is the product of the path *a* from the predictor to the mediator and the path *b* from the mediator to self-esteem (see Figure 4). *c'* denotes the direct path from the predictor to self-esteem controlling for the indirect paths included in the model.

* $p < .05$.

Table 7

Selection and Socialization Effects in Serial Monogamists

Comparison group	Selection effect		Socialization effect					
	<i>Odds Ratio</i>	<i>p</i>	Time 2		Time 3		Time 4	
			<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>
Individuals staying single	1.14	.177	0.05	.482	-0.15	.068	-0.19	.063
Individuals staying in a relationship	1.04	.701	-0.06	.369	0.04	.965	-0.07	.239
Individuals experiencing break-up	1.13	.237	0.08	.421	-0.06	.431	-0.10	.318
Individuals beginning a relationship	0.99	.933	-0.08	.328	-0.11	.164	-0.17	.090

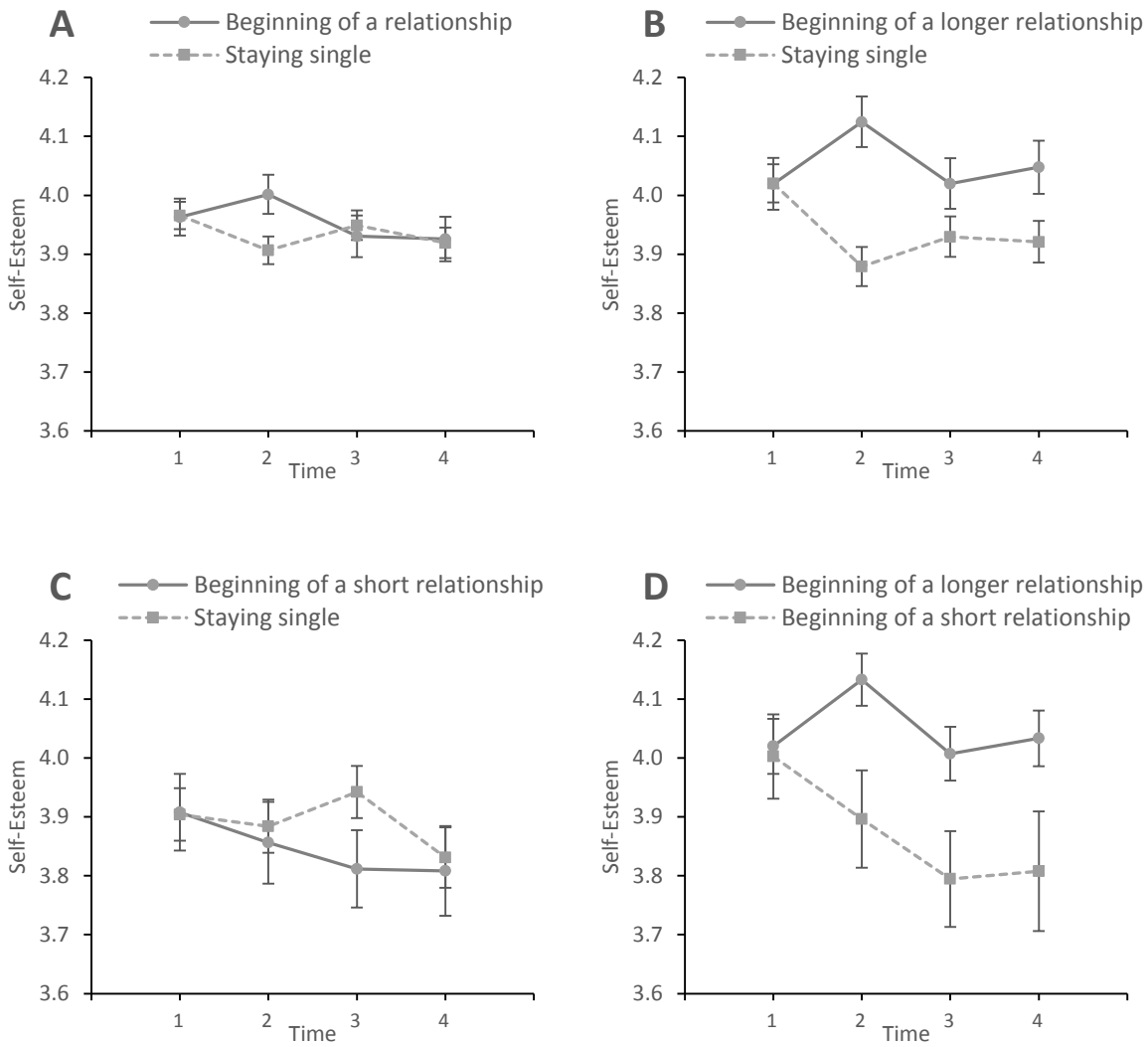


Figure 1. Development of self-esteem as a function of experiencing versus not experiencing the beginning of a relationship between Time 1 and Time 2. In each panel, the two groups compared have been matched using propensity score matching. Error bars represent one standard error above and below the mean.

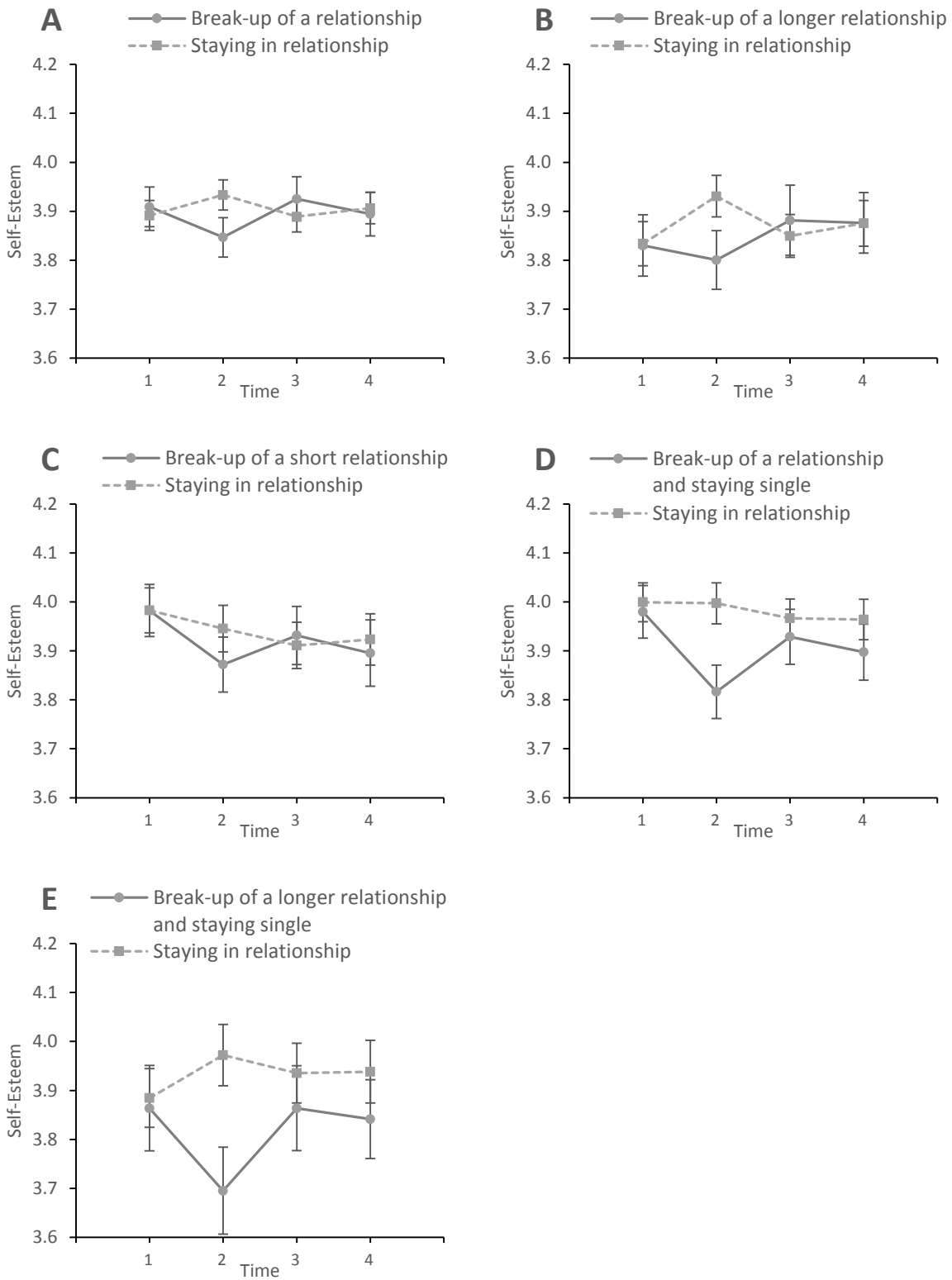


Figure 2. Development of self-esteem as a function of experiencing versus not experiencing relationship break-up between Time 1 and Time 2. In each panel, the two groups compared have

been matched using propensity score matching. Error bars represent one standard error above and below the mean.

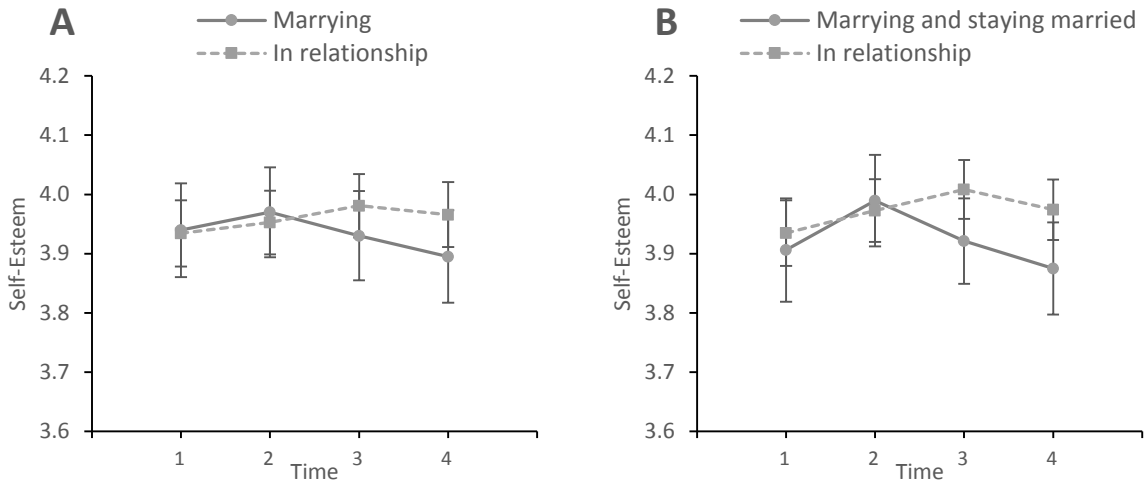


Figure 3. Development of self-esteem as a function of experiencing versus not experiencing marrying between Time 1 and Time 2. In each panel, the two groups compared have been matched using propensity score matching. Error bars represent one standard error above and below the mean.

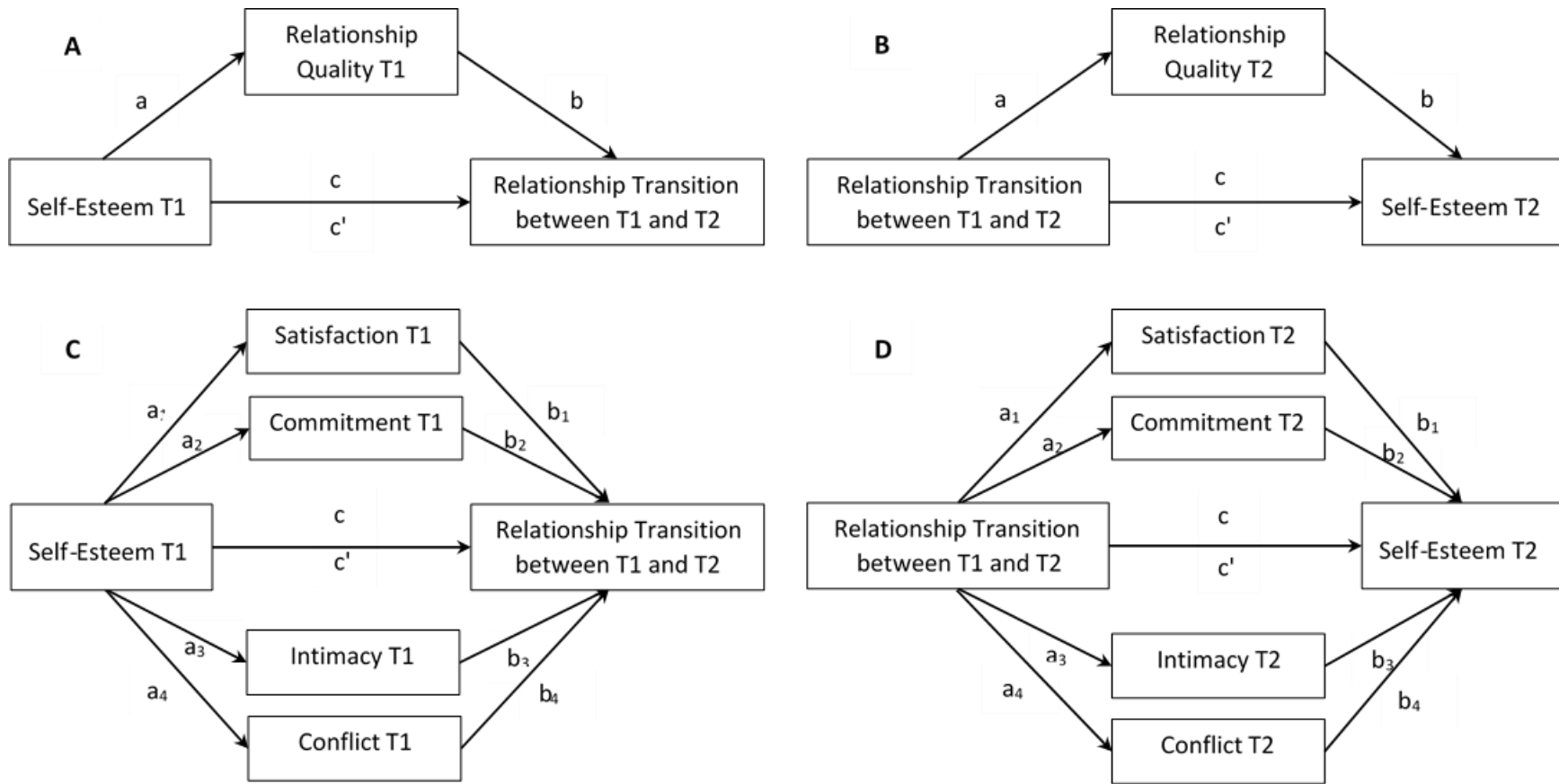


Figure 4. Mediation models of the relation between self-esteem and transitions in romantic relationships. The models in Panels A and B are simple mediation models, including one relationship quality variable (i.e., satisfaction, commitment, intimacy, or conflict) as mediator of the effect. The models in Panels C and D are multiple mediation models, including four relationship quality variables as parallel mediators of the effect; consequently, in these models the effects of the four mediators are mutually controlled for each other.

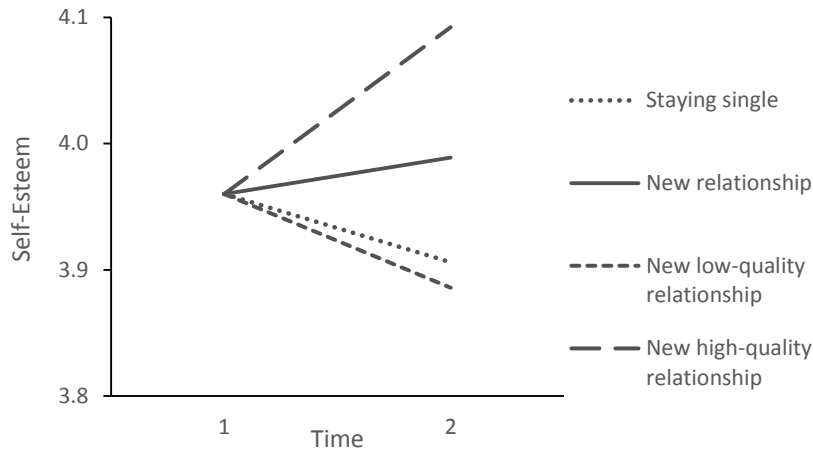


Figure 5. Development of self-esteem as a function of beginning a new relationship between Times 1 and 2 and relationship quality. A high-quality relationship is operationalized as one standard-deviation unit above the mean of relationship quality and a low-quality relationship as one standard-deviation unit below the mean.

Appendix

Variables Controlled for in the Propensity Score Matching Analyses

Self-esteem (3 items; see Method section)

Big Five personality traits (short version of the Big Five Inventory by Rammstedt & John, 2005; includes 5 scales measuring neuroticism, extraversion, agreeableness, conscientiousness, and openness; openness was assessed with 5 items and the other Big Five factors with 4 items)

Gender

Age

Nationality (dichotomous variable: German vs. non-German)

Migration background (dummy coded: no migration background, one parent immigrated to Germany, immigrant with German ancestors, immigrant without German ancestors)

Employment status (dichotomous variable: employed vs. nonemployed)

Attending education or vocational training (dichotomous variable: yes vs. no)

Living with parents (dichotomous variable: yes vs. no)

Residence (dichotomous variable: East vs. West Germany)

Having been married to someone in the past who is not the present partner (dichotomous variable: yes vs. no)

Sexual orientation (dichotomous variable: heterosexual vs. homosexual)

Duration of current relationship (in months)