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Divorce and personality development across middle adulthood

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Abstract
This study tested whether divorce helps explain individual differences in personality development in the years that follow a divorce. The sample consisted of 526 middle-aged adults aged 42–46 years at the beginning. Personality traits were measured using the NEO-Five-Factor Inventory at three measurement occasions over 12 years. First, personality development was characterized by individual differences in change. Second, those individuals who experienced a divorce showed a decrease in extraversion and positive affect over time although nondivorced individuals did not change on these traits. Third, divorce was associated with a decrease in dependability. Fourth, divorce was associated with a decrease in orderliness for individuals who were remarried. The results of this study indicated that divorce had little influence on personality development.

Divorce is a life experience that might have several consequences for the divorcees. Indeed, studies reported a variety of long-term economic, social, physical, and mental health consequences, although the full extent of such effects remains debated (Demo & Fine, 2010). Such consequences are of increasing interest for research and have practical implications. To date, most previous studies on individual consequences of divorce focused on changes in the domains of well-being and health. However, little is known about long-term associations between the experience of a divorce and changes in personality. The current longitudinal study thus sought to test whether divorce can help explain individual differences in personality development of middle-aged adults in the years that follow a divorce. Moreover, several moderators of the potential relation between divorce and personality development were tested.

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Individual and social consequences of divorce

Divorce is considered a major life change that can be a stressful experience, even when the marriage was unhappy and divorce was desired (Waite, Luo, & Lewin, 2009). During this life change, individuals have to deal with many stressors such as interpersonal conflicts, prolonged uncertainty, divorce negotiations, and residential and financial changes. In addition to the idea that a divorce represents a "temporary crisis," researchers have claimed that divorce can be seen as a source of multiple chronic strains that might have long-term consequences for the divorcees (Amato, 2010; Demo & Fine, 2010). Indeed, divorce seems to have both negative short- and long-term consequences for some individuals.

First, declines in well-being following divorce have been evidenced across multiple dimensions (Johnson & Wu, 2002; Luhmann & Eid, 2009; Waite et al., 2009). Although some studies suggest that the typical period of decline lasts around 2 years (Hetherington & Kelly, 2002), other studies suggest that a number of individuals show declines in well-being after a divorce that last for several years without returning to baseline levels (Johnson & Wu, 2002; Waite et al., 2009). Second, individuals who undergo divorce tend to evidence decreases in general mental health (Wade & Pevalin, 2004) and increases in depressive symptoms (Bulloch, Williams, Lavorato, & Patten, 2009). Third, physical health seems to be affected by divorce. For example, Sbarra and Nietert (2009) established an increased mortality risk for divorced individuals over a 40-year period, suggesting long-term and cumulative negative effects of divorce on physical health. Fourth, a divorce has major economic consequences such as less money for both partners, but especially for women and children, and potentially greater work hours per week, which is especially stressful when children are at home most or all of the time, which is most likely with mothers (Gadalla, 2009; Sayer, 2006). Another consequence refers to an increased risk of unemployment for men (Kalmijn, 2005). Fifth, divorce might be a source of chronic stress in parenting, which in turn can have downstream effects on children. For example, research indicates that parental divorce is associated with offspring psychopathology (D'Onofrio et al., 2005). Moreover, research suggests that the risk of externalizing behaviors and internalizing problems, lower academic achievement, and more problems in social relationships is greater for children whose parents divorce than for those whose parents stay together (cf. Lansford, 2009).

Although the strains associated with divorce might be stressful across all ages, there are specific needs and challenges in middle adulthood that might make adults in this life period sensitive to the effects of divorce (Willis & Martin, 2005). Specifically, midlife is a challenging period with diverse environmental and individual changes and multiple social roles with widest responsibilities in socially complex environments (Allemand, in press; Lachman, 2004). This includes not only work careers, but also family roles in terms of relationships with other generations (e.g., children, parents; Willis & Martin, 2005). For example, middle-aged adults as the "sandwich-generation" sometimes have to care for ill parents and at the same time for demanding and challenging children or adolescents (Shifren, 2009). This double strain may be a source of chronic stress in midlife that requires an adaptive balance between parent care and employment and family roles. The potential negative consequences of a divorce might increase the number of complex challenges of middle adulthood. Furthermore, divorce might be especially significant in the midlife period because family is often reported as the most important area in the life of middle-aged adults (American Association of Retired Persons, 2002). In sum, the negative short- and long-term consequences after divorce seem to be manifold and extend to almost every life domain. However, it is a largely open question, whether and to what degree divorce is related to long-term individual differences in personality development and what happens to personality traits in the years that follow a divorce.

Divorce and personality development

Previous research has demonstrated individual differences in personality development across adulthood (Allemand, Zimprich, & Hertzog, 2007; Mroczek & Spiro, 2003; Roberts & Mroczek, 2008; Roberts, Wood, & Caspi, 2008). In other words, individuals vary with respect to both the degree and the direction of change in their personality traits during the adult years. Accordingly, it becomes a question for research regarding what leads to these different developmental trajectories, with one plausible candidate being those major life experiences, such as divorce, that are experienced by some but not by all adults. As with studying the effect of most major life events, one is left attempting to assess causal claims using naturally occurring "experiments," which are a less than ideal approximation.

To date, few studies have specifically investigated personality development in relation to divorce. In one example (Costa, Herbst, McCrae, & Siegler, 2000), researchers assessed middle-aged adults over 6–9 years, and found that life events and experiences had little influence on the levels of personality traits, although some effects were found with respect to changes in marital status. Specifically, divorced women showed increases in extraversion and openness to experience, but divorced men showed decreases in conscientiousness. As another example, in the Mills longitudinal study of women, divorce was negatively associated with change in dominance from 27 to 43 years, suggesting that women who experienced divorce increased less in dominance than most women did (Roberts, Helson, & Klohnen, 2002). Additional findings from the Mills study suggested that experiencing a divorce at the age of 43 years was prospectively associated with decreases in social responsibility (a facet of conscientiousness) from 43 to 52 years (Roberts & Bogg, 2004). Finally, a recent study examined the influence of several life events including divorce on personality development across a 4-year time period (Specht, Egloff, & Schmukle, 2011). The results surprisingly indicated that individuals became more agreeable and conscientious after divorce across 4 years. Therefore, although correlational research suggests that divorce may be related to personality development, the results are inconsistent across the few available studies.

Several theoretical perspectives suggest mechanisms through which divorce might be related to personality development in the long term. For instance, the *critical life events perspective* suggests that life experiences such as a divorce might be associated with major changes in an individual's life circumstances, self-beliefs, and attitudes in a way that normal routines cannot be upheld (Filipp, 1992, 2007). This perspective assumes that critical life experiences might trigger self-development and serve as an impulse for change. Changes accompanying stressful life experiences not only are situational challenges, but also take place within a person (Filipp & Aymanns, 2009). This is exemplified in discrepant self-beliefs or self-knowledge (e.g., "I am competent and powerful" vs. "my marriage failed"). These challenges and constraints provoked by a critical life experience necessitate adaptation processes and might thus result in changes in behavior, self-beliefs, and attitudes. In line with the conception of personality traits as "consistent patterns of thoughts, feelings, and behaviors" (Johnson, 1997, p. 74), changes in behavior, self-beliefs, or attitudes should be related to gradual development of personality traits. For example, it is possible that divorced individuals are less likely to attend social events, given that divorce would be associated with a diminished social network and less willing to do so after losing a primary social support base. Both of these effects would predict a decrease in extraversion in the long term.

In addition, the *role continuity perspective* suggests that stable social roles promote stability of personality traits (Roberts & Wood, 2006; Roberts et al., 2008). Roles can serve as consistent subjective environments that individuals act within across time and situations, which thus facilitates personality stability over time. Divorce, by definition, is associated with major changes and transitions with respect to role status. Consequently, changes in social roles might promote changes in personality traits. Specifically, new social roles (e.g., being a single parent) come with a new set of expectations and demands (e.g., parental responsibilities). It should be noted that this perspective promotes the idea that personality change should occur because of social role changes, but is less clear regarding the direction of personality change. That said, one possible prediction is that divorce may correspond to a decline in those traits predictive of investing in marital roles, such as conscientiousness (Lodi-Smith & Roberts, 2007).

The Current Study

The objectives of this study were (a) to test whether divorce can help explain individual differences in personality development of middle-aged adults in the years that follow a

divorce, and (b) to explore multiple potential moderators of this effect. In other words, it is investigated whether and to what degree individuals who experienced divorce differed in their developmental pathways in the years that follow the divorce from those individuals without such an experience. In this study, the hypothesis is tested whether personality might change in reaction to a divorce (socialization effect). However, it is also possible that personality might predict the occurrence of life experiences such a divorce (selection effect). For example, studies have shown that personality traits such as neuroticism are prospectively related to divorce (Karney & Bradbury, 1997; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Based on this study design, our focus is on exploring what happens to individuals' personalities in the years after the divorce and whether some conditions or moderators change the effects of divorce.

One important advantage of this work was that we employed measures of both broad and specific traits, in line with the suggestion that personality traits are hierarchically organized with many narrow, specific traits clustering to define broad dimensions at a higher level of abstraction such as the Big Five traits (Costa & McCrae, 1992, 1995; Saucier, 1998). Prior to testing the predictive role of divorce, first mean-level changes were examined whether they evidenced for our personality variables of interest, and individual differences in these changes occurred. The latter is a requirement for examining whether divorce explains individual differences in personality development, as participants must differ in their patterns of change for these patterns to be explained by divorce. We used a multilevel modeling framework (Nezlek, 2011; Singer & Willett, 2003) and analyzed the data both at the broad and at the narrow levels.

Hypotheses and moderators

With respect to our first objective and in line with previous research findings (Costa et al., 2000; Roberts & Bogg, 2004), a negative association was expected between divorce and conscientiousness. For example, divorce might be related to a lower propensity to follow socially prescribed norms and rules as a result of the changes in attitudes toward traditional life paths such as marriage. The scarce available research on the relation between divorce and personality development shows mixed results with respect to the other broad Big Five traits. Given the lack of clear trends, specific relation between divorce and the remaining personality traits at the domain level are not predicted. With regard to the lower order specific traits, research on the relation between divorce and mental health problems (Amato, 2010) would suggest increases in negative affect and self-reproach, two lower order specific traits of neuroticism, in response to divorce. Moreover, the arguments presented above would suggest decreases in the specific traits of conscientiousness (orderliness, goal striving, and dependability) in response to divorce. In general, modest effects of divorce on changes in personality at the broad trait level and at the lower order narrow level were expected, given that there are many individual differences with respect to the quality of the previous marriage and the divorce experience.

With respect to moderators of personality development after divorce, first, as noted above, there is initial evidence for differential effects of divorce on trait changes for women and men (Costa et al., 2000). However, very few other moderators have been explicitly tested in past work with respect to the effect of divorce on trait change. Second, socioeconomic factors such as high levels of social support, education, and income might act as a buffer following a divorce (Williams, 2003). Third, having children also might moderate the influence of divorce on individual functioning. Being a parent when experiencing a divorce can create additional strains that persist over the long haul (Amato, 2010). Finally, the moderating role of remarriage was also tested. Johnson and Wu (2002) found that decreases in psychological well-being following divorce did not improve until individuals got remarried. In sum, the following potential moderators of personality development were tested in an exploratory way: gender, having children, remarriage, distance to the last divorce, educational attainment, household net income,

satisfaction with friends, and satisfaction with the financial situation.

Method

Participants

Data from the Interdisciplinary Study on Adult Development (ILSE; Allemand et al., 2007; Allemand, Zimprich, & Martin, 2008) were used. In the ILSE sample from Germany, participants were included from two cohorts: one comprises individuals born before World War II and the other includes individuals born shortly after the war (i.e., 1930–1932 vs. 1950–1952, respectively). The study started in 1994 (T1), followed by reassessments in 1998 (T2) and in 2006 (T3). Data from all three measurement occasions were used in terms of personality change. For this study, the younger age cohort was alone included as our focus was on development across middle adulthood.

The sample consisted of 705 middle-aged adults from 42 to 46 years at T1. For this study, participants without data on marital status and information regarding divorce and children were excluded, resulting in 526 participants. To examine potential bias caused by nonresponse, the participants of our final sample were compared with the excluded participants. Participants who were included in this study did not differ with respect to gender and personality traits at T1 from participants who dropped out. Participants who dropped out were significantly less educated ($M = 13.63$, $SD = 2.59$) than those in the final sample ($M = 14.11$, $SD = 2.51$), $F(1, 681) = 4.70$, $p < .05$, Cohen's $d = 0.19$. However, the magnitude of this difference was small.

From the 526 participants, 315 (59.9%) had data from all three occasions, 159 participants (30.2%) from two occasions, and 52 participants (9.9%) from only one measurement occasion. One advantage of multilevel modeling analysis is its ability to handle missing data (Nezlek, 2011; Singer & Willett, 2003). Therefore, we were able to include many more participants in our analysis.

One hundred and forty-three (27.2%) participants experienced at least one divorce in the past ($M = 1.18$, $SD = 0.5$, $Mdn = 1.0$, range = 1–4). Of the divorced participants, 76 (53.1%) were female, whereas 177 (46.2%) of the nondivorced participants were female, $\chi^2(1) = 2.01$, *ns*. The divorced participants had a slightly lower mean level of education ($M = 13.7$ years, $SD = 2.3$) than the nondivorced participants ($M = 14.3$, $SD = 2.6$), $F(1, 518) = 7.27$, $p < .05$, $d = 0.24$. On an 11-point scale ranging from 1 (*below 500 Deutsche Mark [DM]*) to 11 (*above 6,000 DM*) divorced participants ($M = 7.4$ [~3,500 DM], $SD = 2.6$) also differed from the nondivorced with respect to monthly household net income at T1 ($M = 8.5$ [~4,100 DM], $SD = 2.1$), $F(1, 524) = 24.87$, $p < .001$, $d = 0.47$. The magnitude of this difference reflects a medium-sized effect. Regarding remarriage at T1, 61 (42.7%) of the divorced participants were remarried and 130 (90.9%) had children, although 325 (84.9%) of the nondivorced had children, $\chi^2(1) = 3.27$, *ns*. The mean distance from T1 to the last divorce was 12.75 years ($SD = 6.12$). Divorced participants ($M = 3.98$, $SD = 0.84$) did not significantly differ from nondivorced at T1 ($M = 3.92$, $SD = 0.67$) regarding satisfaction with friends as indicated on a scale ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*), $F(1, 524) = 0.78$, *ns*. However, a group difference evidenced with respect to satisfaction with the financial situation at T1 was measured with a single item ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*). Divorced participants were less satisfied with their financial situation ($M = 3.42$, $SD = 1.11$) than nondivorced participants ($M = 3.66$, $SD = 1.00$), $F(1, 524) = 5.35$, $p < .05$, $d = 0.23$.

Measures

The data had a multilevel structure with measurement occasions (Level 1) nested within individuals (Level 2).

Level 1 variables

The Big Five personality traits (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) were measured using the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992). The

NEO-FFI is a 60-item instrument designed to measure the Big Five personality factors, with each personality factor being assessed by 12 items. Participants were asked to respond on a 5-point Likert-type scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*).

Saucier (1998) demonstrated that most of the items of the NEO-FFI fall into distinct, albeit related lower order narrow traits ("cluster subcomponents"; see also Chapman, 2007). The item clusters of neuroticism are *negative effect* (feels inferior, worthless, helpless, and ashamed) and *self-reproach* (worried, stressed, anxious, and depressed). Extraversion has the item clusters *positive affect* (light-hearted, cheerful, and optimistic), *sociability* (gregarious, enjoys others, and prefers company), and *activity* (energetic, active, fast paced, and action seeking). The items for openness to experience fall into the clusters *aesthetic interests* (artistic, poetic, and aesthetically sensitive), *intellectual interests* (abstract, philosophical, and intellectual), and *unconventionality* (nonconforming, free thinking, and whimsical). Regarding agreeableness, the item clusters *nonantagonistic orientation* (cooperative, trusting, amiable, and conflict avoidant) and *prosocial orientation* (actively courteous and considerate, well liked) can be identified. Finally, conscientiousness has the item clusters *orderliness* (methodical, neat, organized, and efficient), *goal striving* (goal driven, hard working, and motivated to excel), and *dependability* (reliable, consistent, and dependable). The number of items per cluster ranges from three to eight items. Estimates of internal consistency for all scales and measurement occasions are shown in Table 1. The alpha reliabilities for the Big Five traits ranged from 0.59 (openness at T1) to 0.86 (neuroticism at T3). Given the small number of items per cluster, one would expect lower than average reliabilities for the lower order narrow trait scales or item clusters. Indeed, the reliabilities for some item clusters were lower than average reliabilities (see Table 1).

Table 1. *Descriptive statistics for personality traits at the broad and narrow levels*

	T1 (1994)			T2 (1998)			T3 (2006)			
Trait: Item cluster (*N* items)	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*	α	ICC
Neuroticism	1.47	0.58	0.80	1.34	0.58	0.84	1.42	0.62	0.86	0.63
Negative affect (5)	1.53	0.68	0.58	1.36	0.68	0.67	1.50	0.73	0.74	0.52
Self-reproach (7)	1.44	0.65	0.78	1.33	0.62	0.78	1.36	0.64	0.80	0.63
Extraversion	2.38	0.48	0.72	2.37	0.47	0.73	2.31	0.49	0.77	0.69
Positive affect (4)	2.69	0.72	0.77	2.73	0.69	0.75	2.68	0.72	0.82	0.65
Sociability (4)	2.38	0.61	0.46	2.35	0.60	0.52	2.31	0.61	0.51	0.59
Activity (4)	2.07	0.62	0.54	2.02	0.62	0.57	1.95	0.60	0.59	0.62
Openness to experience	2.26	0.43	0.59	2.24	0.44	0.64	2.28	0.44	0.66	0.73
Aesthetic interests (3)	2.48	0.71	0.54	2.50	0.70	0.57	2.51	0.73	0.69	0.60
Intellectual interests (3)	2.50	0.73	0.58	2.43	0.74	0.59	2.53	0.75	0.66	0.65
Unconventionality (4)	1.80	0.62	0.28	1.80	0.59	0.31	1.79	0.57	0.37	0.55
Agreeableness	2.63	0.41	0.63	2.65	0.41	0.68	2.69	0.40	0.69	0.67
Nonantagonistic orientation (8)	2.47	0.46	0.50	2.49	0.47	0.58	2.54	0.45	0.57	0.63
Prosocial orientation (4)	2.96	0.50	0.51	2.96	0.46	0.51	2.99	0.47	0.62	0.55
Conscientiousness	2.94	0.44	0.76	2.93	0.44	0.78	2.92	0.43	0.76	0.67
Orderliness (5)	2.96	0.56	0.62	2.97	0.55	0.65	2.94	0.55	0.67	0.60
Goal striving (3)	2.62	0.67	0.61	2.59	0.68	0.63	2.59	0.69	0.67	0.60
Dependability(4)	3.15	0.49	0.59	3.13	0.47	0.60	3.14	0.46	0.60	0.56

Note. *N*s = 526 (T1), 468 (T2), 321 (T3). The scales range from 0 to 4. ICC = intraclass correlation coefficient (see the Results section). ICC represents the proportion of variance that is between persons.

However, our reliabilities are within the range of previous studies using the item clusters (Chapman, 2007).

Level 2 variables

To test whether divorce can help explain individual differences in personality development, divorce prior to T1 was included as a potential moderator. Moreover, we tested the following variables as additional moderators of change: gender, having children, remarriage, distance from the divorce to T1, educational attainment, household net income, satisfaction with friends, and satisfaction with the financial situation.

Statistical analysis

Data were analyzed with multilevel regression models using the software hierarchical linear and nonlinear modeling (HLM; version 6.08; Raudenbush, Bryk, & Congdon, 2005). In multilevel models, intraindividual change is modeled at Level 1 using time-varying variables (Nezlek, 2011; Singer & Willett, 2003). Individual differences in personality development are modeled by time-invariant variables such as divorce at Level 2. Level 1 and Level 2 models were built stepwise and separately for each personality trait at the broad and narrow levels. In Step 1, we modeled personality development in a simple model containing only Level 1 and not Level 2 variables to examine whether individual differences in personality development exist. In Step 2, this model was extended by including the Level 2 variable divorce to help explain individual differences in personality development. The other Level 2 variables were included stepwise into the model. These variables were retained if they improved the fit of the model according to the chi-square test of deviance at $p < .05$. For data analysis, all mean scores of the personality measures were z-transformed (Singer & Willett, 2003). The variable time represents how many years have passed since the first measurement occasion: T1 was coded as 0, T2 as 4, and T3 as 12. All moderators were grand-mean centered (Singer & Willett, 2003). Although no consensus occurs with respect to the appropriate effect sizes in multilevel modeling, and effect sizes are not as straightforward as in analysis of variance or multiple regression analyses, we employed the strategy suggested by Peugh (2010) and reported global pseudo-R^2 statistics. This measure of effect size quantifies the variance in the outcome variable explained by all predictor variables in the multilevel model and can be computed in a similar way as the R^2 in multiple regressions (for details, see Peugh, 2010).

Results

Means and standard deviations for the personality traits at the broad and narrow levels are displayed in Table 1 for all measurement occasions. The results for mean-level changes and rank-order stabilities of personality traits in this sample are reported elsewhere (Lehmann, Allemand, Zimprich, & Martin, 2010).

First, the amount of between- and within-person variations was examined for each personality variable by means of the intraclass correlation coefficient (ICC; Nezlek, 2011; Raudenbush & Bryk, 2002). Table 1 shows the results of these analyses. For example, for neuroticism, the ICC was 0.63, implying that 63% of the total variation in neuroticism was between-person variance (interindividual differences) and 37% was within-person variation (intraindividual variability). If all individuals were stable over time on these traits and the lower order narrow traits (i.e., cluster subcomponents), the only variation that would occur would be between-person variation and the ICC would approach 1.00. Although between-person variation did account for around 60% of the variability for most traits in this study, substantial portions were within person, indicating the need for multilevel modeling.

Second, fixed and random effects from models that allowed individuals to vary in both level and rate of personality development were estimated. Table 2 shows the results of these analyses. Variance estimates of the intercept significantly differed from zero, reflecting individual differences in initial levels in all personality variables at the broad and narrow levels. More importantly, variance estimates

Table 2. *Growth curve estimates for personality traits at the broad and narrow levels*

Traits: Item clusters	Fixed effects estimates (*SE*)		Random effects estimates (*SE*)				Model test
	Intercept (I)	Slope (S)	Variance of I	Variance of S	Covariance of I, S	Residual variance	−2LL
Neuroticism	−0.00 (0.04)	0.00 (0.00)	0.66*** (0.81)	0.00 (0.02)	−0.00 (0.00)	0.35 (0.60)	3270.84
Negative effect	−0.02 (0.04)	0.00 (0.00)	0.50*** (0.71)	0.00 (0.02)	−0.00 (0.00)	0.45 (0.67)	3396.55
Self-reproach	−0.04 (0.04)	0.01 (0.00)	0.65*** (0.80)	0.00** (0.03)	−0.01 (0.00)	0.33 (0.58)	3260.40
Extraversion	0.01 (0.04)	−0.00 (0.00)	0.75*** (0.87)	0.00*** (0.04)	−0.01 (0.00)	0.26 (0.51)	3146.88
Positive affect	0.01 (0.04)	−0.00 (0.00)	0.65*** (0.80)	0.00** (0.03)	−0.00 (0.00)	0.30 (0.55)	3175.98
Sociability	0.02 (0.04)	−0.00 (0.00)	0.59*** (0.77)	0.00 (0.02)	0.00 (0.00)	0.40 (0.63)	3349.52
Activity	0.00 (0.04)	−0.00 (0.00)	0.70*** (0.83)	0.00*** (0.05)	−0.01 (0.00)	0.29 (0.54)	3239.34
Openness to experience	0.00 (0.04)	−0.01 (0.00)	0.77*** (0.88)	0.00*** (0.03)	−0.01 (0.00)	0.23 (0.48)	3036.01
Aesthetic interests	0.01 (0.04)	−0.00 (0.00)	0.58*** (0.76)	0.00* (0.02)	−0.00 (0.00)	0.37 (0.61)	3298.10
Intellectual interests	−0.00 (0.04)	−0.00 (0.00)	0.65*** (0.81)	0.00 (0.02)	−0.00 (.00)	0.34 (0.58)	3243.30
Unconventionality	−0.03 (0.04)	0.00 (0.00)	0.60*** (0.77)	0.00** (0.04)	−0.01 (0.00)	0.39 (0.63)	3354.48
Agreeableness	0.01 (0.04)	−0.00 (0.00)	0.73*** (0.85)	0.00*** (0.04)	−0.01 (0.00)	0.28 (0.53)	3194.52
Nonantagonistic orientation	0.01 (0.04)	−0.00 (0.00)	0.67*** (0.82)	0.00** (0.03)	−0.01 (0.00)	0.34 (0.58)	3272.20
Prosocial orientation	0.00 (0.04)	0.00 (0.00)	0.65*** (0.80)	0.00*** (0.04)	−0.01 (.01)	0.37 (0.61)	3360.66
Conscientiousness	0.01 (0.04)	0.00 (0.00)	0.67*** (0.82)	0.00 (0.02)	0.00 (.00)	0.32 (0.57)	3209.69
Orderliness	0.01 (0.04)	0.00 (0.00)	0.62*** (0.79)	0.00** (0.03)	−0.01 (.00)	0.35 (0.60)	3279.12
Goal-striving	0.01 (0.04)	−0.00 (0.00)	0.57*** (0.76)	0.00 (0.01)	0.00 (.00)	0.39 (0.63)	3321.55
Dependability	−0.00 (0.04)	0.00 (0.00)	0.58*** (0.76)	0.00*** (0.04)	−0.01 (0.00)	0.38 (0.62)	3365.01

Note. $N = 526$; the number of observations is 1,315. Random slopes model with robust standard errors. Trait scores were *z*-transformed before analyses. Standard errors are given in parentheses. −2LL = −2 log likelihood, a fit index.
*$p < .05$. **$p < .01$. ***$p < .001$.

for the slopes were significantly different from zero for extraversion, openness to experience, and agreeableness, and for nine specific traits (Table 2). This indicates significant variability among individuals in rate of change on these traits, and thus, the ability to examine whether this variability could be predicted using Level 2 variables. No significant individual differences in change though were found for neuroticism and conscientiousness.

In the next step, we tested whether divorce and the other Level 2 variables help explain individual differences in personality development. These analyses were performed for all personality traits demonstrating significant variance in the slope in the previous step of analysis.

Four significant but small effects of divorce and a small effect of remarriage were obtained. Table 3 shows the results of these analyses. First, although divorce did not help explain individual differences in the initial level of extraversion, it was a significant moderator of change in extraversion. In other words, individuals who experienced a divorce before T1 tended to become less extraverted over 12 years. In contrast, nondivorced individuals seem to be more or less stable on extraversion over time. Figure 1 depicts the extraversion trajectories for the nondivorced and the divorced individuals. None of the tested variables significantly moderated the development of extraversion. The effect size in terms of global pseudo-R^2 (cf. Peugh, 2010) was 0.002, suggesting that 0.2% of the total amount of variation in extraversion could be explained by linear change and the interaction between linear change and divorce.

Second, divorce helped to explain individual differences in the development of positive affect, a lower order trait of extraversion. Positive affect showed patterns similar to that of overall extraversion, whereas the two other traits at the narrow level did not (Table 3). As shown in Figure 1, divorced individuals tended to decrease in positive affect whereas the nondivorced individuals were relatively stable over 12 years. No significant moderators of change were found for positive affect. The effect size in terms of global pseudo-R^2 was 0.3%.

Third, divorce was related to variability in the development of the specific trait orderliness, a lower order trait of conscientiousness. It explained individual differences in the rate of change of orderliness but not in the intercept (Table 3). However, when including remarriage in the model, this variable helped to explain change in orderliness more strongly than divorce alone. As shown in Table 3, individuals who experienced a divorce and a remarriage became significantly less orderly over time. In contrast, nondivorced individuals and individuals who experienced a divorce but not a remarriage tended to be relatively stable in orderliness (Figure 1). The effect size in terms of global pseudo-R^2 was 0.2%.

Fourth, divorce explained individual differences in the intercept of dependability (Table 3). At the baseline, divorced individuals were lower in dependability compared to nondivorced individuals. In addition, divorce was associated with individual differences in the development of dependability over 12 years. Although the divorced individuals generally decreased in dependability, the nondivorced individuals seem to be relatively stable over time (Figure 1). The effect size in terms of global pseudo-R^2 was 1.2%.

Discussion

This study tested whether divorce helps explain individual differences in personality development of middle-aged adults in the years that follow a divorce. Four primary results stand out. First, our findings contribute to the literature by showing individual differences in the development of extraversion, openness to experience, and agreeableness in middle adulthood, thus replicating previous research (Mroczek & Spiro, 2003; Roberts et al., 2008). However, we did not find variability in the degree and direction of change in neuroticism and conscientiousness at the broad level. Similarly, Allemand, Gomez, and Jackson (2010) did not find individual differences in change in conscientiousness in a sample of middle-aged adults aged 40–60 years over 10 years. Second, divorce helped explain individual differences in the development of extraversion at the broad and narrow levels

Table 3. *Growth models of extraversion, positive affect, orderliness, dependability with divorce*

Effects	Estimate (*SE*)	*t* (*df*)	χ^2
Extraversion			
Fixed			
Intercept	0.01 (0.04)	$t(525) = 0.26$	
Slope	0.00 (0.00)	$t(524) = 0.48$	
Divorce × Slope	−0.02 (0.01)	$t(524) = -2.04$*	
Random			
Variance of intercept	0.75 (0.87)		2,200.92***
Variance of slope	0.00 (0.04)		633.73***
Covariance of intercept, slope	−0.01 (0.00)		
Residual variance	0.26 (0.51)		
Model summary			
−2LL	3,141.47**		
Global pseudo-R^2	0.002		
Positive affect			
Fixed			
Intercept	0.01 (0.04)	$t(525) = 0.15$	
Slope	0.00 (0.00)	$t(524) = 1.15$	
Divorce × Slope	−0.02 (0.01)	$t(525) = -2.63$**	
Random			
Variance of intercept	0.64 (0.80)		1,755.40***
Variance of slope	0.00 (0.03)		548.16**
Covariance of intercept, slope	−0.00 (0.00)		
Residual variance	0.30 (0.55)		
Model summary			
−2LL	3,167.46*		
Global pseudo-R^2	0.003		
Orderliness			
Fixed			
Intercept	0.01 (0.04)	$t(525) = 0.32$	
Slope	0.00 (0.00)	$t(523) = 1.35$	
Divorce × Slope	−0.01 (0.01)	$t(523) = -0.97$	
Divorce × Remarried × Slope	−0.04 (0.02)	$t(523) = -2.28$*	
Random			
Variance of intercept	0.62 (0.79)		1,546.46***
Variance of slope	0.00 (0.03)		542.89*
Covariance of intercept, slope	−0.00 (0.00)		
Residual variance	0.35 (0.59)		
Model summary			
−2LL	3,264.78**		
Global pseudo-R^2	0.002		
Dependability			
Fixed			
Intercept	0.05 (0.05)	$t(524) = 1.12$	
Slope	0.01 (0.01)	$t(524) = 1.25$	
Divorce	−0.19 (0.09)	$t(524) = -2.07$*	
Divorce × Slope	−0.02 (0.01)	$t(524) = -2.07$*	
Random			
Variance of intercept	0.57 (0.76)		1,305.79***
Variance of slope	0.00 (0.04)		578.78**
Covariance of intercept, slope	−0.01 (0.00)		
Residual variance	0.38 (0.62)		
Model summary			
−2LL	3,351.22*		
Global pseudo-R^2	0.012		

Note. $N = 526$, the number of observations is 1,315. Random slopes model with robust standard errors. Trait scores were *z*-transformed before analyses. Standard errors are in parentheses. −2LL = −2 log likelihood, a fit index.
*$p < .05$. **$p < .01$. ***$p < .001$.

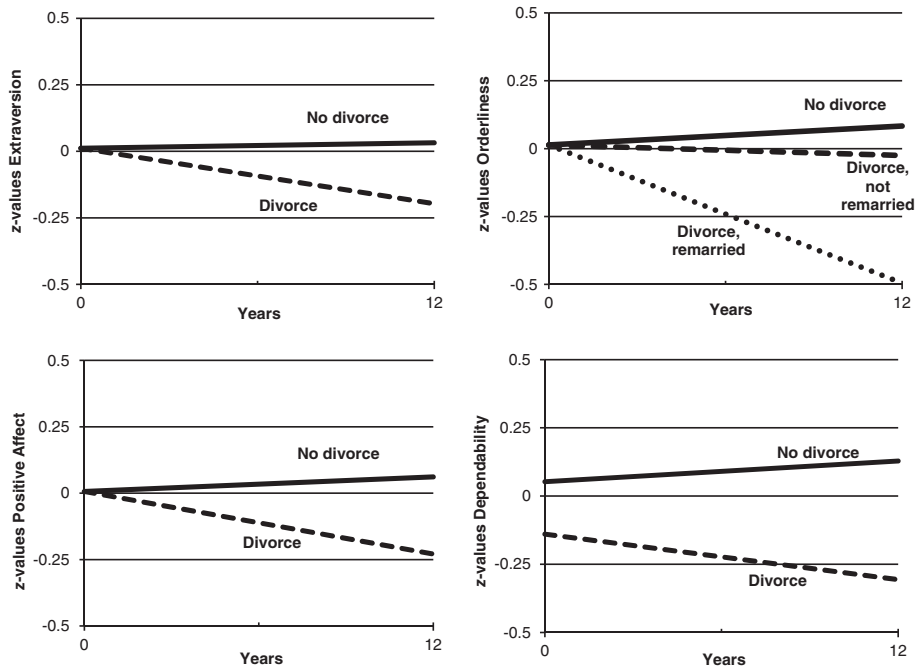

Figure 1. Growth models for the multilevel regression analysis of extraversion, positive affect, orderliness, and dependability as a function of divorce.

(i.e., positive affect). Specifically, divorce was associated with a decrease in these two traits. Third, a slight decrease in two lower order traits of conscientiousness, that is, orderliness and dependability, were found for those participants in the years after the divorce. Fourth, only remarriage was a significant moderator of personality change after divorce, and even this variable moderated only one change effect. Specifically, divorce was associated with a decrease in orderliness only for individuals who were remarried. It should be noted that the effects of divorce on personality development were generally small in terms of the reported effects sizes.

Divorce and development of broad personality traits

Our results indicate that divorce tends to contribute to the explanation of individual differences in the development of extraversion across middle adulthood. It is interesting to note that although divorce is often related to several long-term individual and social consequences (Amato, 2010; Demo & Fine, 2010), the effects of divorce on personality development are modest in terms of effect sizes. A decrease in extraversion over time was found for those participants in the years after the divorce. This decrease was not moderated by gender or distance from the divorce. The differential trajectory for extraversion in reaction to a divorce (socialization effect) may refer to an underlying process by which stressful life events influence personality. The critical life events perspective suggests that challenges and constraints provoked by a life experience such as a divorce necessitate adaptation processes and might result in changes in behavior, self-beliefs, and attitudes (Filipp, 2007). Role changes and transitions to new roles such as the role of single parent (90.9% of the divorced individuals in our study had children) might be an additional explanation for the decrease in extraversion in response to divorce (Roberts & Wood, 2006). The challenges and constraints provoked by a divorce may trigger a stronger focus on the "inside world" rather than on the world

outside the self, causing the individual to avoid social contact. Likewise, divorced adults may have a difficult time maintaining friendships and may face greater loneliness than married individuals, as in addition to losing a spouse they often lose many of their social contacts such as in-law, married friends, and neighbors. Hence, divorce likely will affect the social life and attenuate the social network, in turn diminishing opportunities to act in an extraverted fashion and to be involved in social activities. Although the effects of divorce on extraversion were modest in magnitude, a long-term decline in extraversion may have several consequences, given its connections to social and emotional support (Bowling, Beehr, & Swader, 2005) and physical health outcomes, such as blood pressure (Miller, Cohen, Rabin, Skoner, & Doyle, 1999) and susceptibility to colds (Cohen, Doyle, Turner, Alper, & Skoner, 2003). A practical implication of the results would be to create increasing social opportunities such as network building for individuals who experience divorce. Similarly, individual therapeutic applications would focus on realigning/recreating social goals outside the marriage network.

Given these results for extraversion, the Big Five trait most linked to positive emotions, it is surprising that analyses showed no association between divorce and change in neuroticism, or its lower order traits, which tends to reflect negative emotionality. Thus, it is showed that this finding is consistent with past results regarding neuroticism and divorce (Costa et al., 2000). This finding is also consistent with recent longitudinal findings on change in midlife neuroticism following exposure to traumatic events. Results indicated that neuroticism is relatively stable across middle adulthood from 42 to 50 years among individuals with and without lifetime histories of trauma exposure (Ogle, Rubin, & Siegler, 2014). It is possible that some life experiences such as divorce might differentially influence the Big Five personality traits, insofar that some traits might be more responsive to events in the longer term, whereas some traits might be affected in the shorter term. For example, it can be assumed that neuroticism might not be systematically influenced over longer time period, but instead is more responsive for temporary life circumstances and events and then readapt faster as a function of coping and adaptation processes (Filipp, 2007).

Taken together, the results of this study show an intriguing pattern for the two "affective" Big Five traits. It seems that divorced individuals were able to *down regulate* the negative feelings, thoughts, and behaviors that are typically associated with a divorce in the short and intermediate terms (Hetherington & Kelly, 2002), which maintained their normal levels of neuroticism. However, they were not able to *up regulate* positive affect in the long term, leading to a decline in extraversion. Future studies may test these ideas using more specific measures of affective traits and experiences.

Divorce and development of narrower personality traits

Our results show that divorce helped explain individual differences in the development of personality traits at a more fine-grained level. In particular, divorce was associated with the rates of change in positive affect, orderliness, and dependability. First, individuals who experienced a divorce tended to show a decline in positive affect, a lower order trait of extraversion, although the nondivorced individuals stayed more or less stable over this time period. The effects on positive affect follow the same logic as provided above with respect to the higher order trait extraversion. The decrease in positive affect with divorce may have ramifications for life happiness, as research suggests that positive affect fosters specific adaptive resources and activities such as social engagement and interactions that are central to happiness and meaning in life (Lyubomirsky, King, & Diener, 2005). In contrast, decreases in positive affect and extraverted behaviors may have negative consequences for social well-being and happiness beyond midlife to old age. An avenue for future research is to study the long-term effects of decreases in positive affect and extraversion across middle adulthood.

Second, divorced individuals showed lower initial levels and a long-term decrease in dependability in the years after the divorce as

compared to the nondivorced adults. Dependability is one of the most liked partner traits (Lippa, 2007). It is possible that during marriage, dependability was requested and promoted by the partner. In line with this argument, Tucker and Anders (2001) reported a positive association between social control and health behavior in married couples. Applied to marriage, reliable and dependable behaviors may be promoted through a greater feeling of obligation to the spouse as well as through requests, reminders, threats, and rewards from the spouse. The disappearance of this kind of social control after divorce might have brought along a decrease in dependability in the divorced individuals in the long term. A long-term decrease in dependability might also have negative consequences for mating success and well-being, as reliable and dependable behaviors are important in building new romantic relationships (e.g., Lippa, 2007), and such success after divorce is beneficial to well-being (Sassler, 2010).

Third, divorce was associated with a decrease in orderliness for individuals who were remarried. This finding is somewhat surprising. However, it is possible that when individuals get remarried, they no longer "need" to be fully organized, relying instead on their new partner for some of these tasks. Future studies, though, are needed to test that assumption. An important avenue for future research on orderliness refers to potential gender differences in traits related to maintaining order and organization combined with the continuing disparity in housekeeping in marriages. Although we did not find gender differences for orderliness, some work suggests that especially young women score slightly higher than young men in orderliness, although gender differences are nonexistent in middle adulthood (e.g., Weisberg, DeYoung, & Hirsh, 2011).

Altogether, the results with respect to the lower order narrow traits illustrate the importance of analyzing personality development not only at the broad trait level but also at a narrower and more specific level such as specific traits or facets (Terracciano, McCrae, Brant, & Costa, 2005). For instance, we would not have evidenced any influence of divorce or remarriage on conscientiousness; hence, we focused solely on the broader level. As such, our results are in line with the suggestion that lower order traits or facets might be more responsive to life events and experiences than traits at the broader level (McCrae et al., 2008).

Regarding other potential moderators, it is interesting to note that gender did not moderate personality trait development after a divorce, counter to previous personality research (Costa et al., 2000). However, this finding is in line with well-being research showing a similar effect of divorce on men and women's emotional well-being (Simon, 2002; Waite et al., 2009; Williams, 2003). Specifically, similar declines in well-being in women and men were found, although the consequences for living conditions (e.g., women are more likely to have custody for their children than divorced men) and the reactions to the divorce (e.g., depressive symptoms in women vs. increased alcohol consumption in men) might have differed by gender.

As expected, the significant effects of divorce evidenced were generally modest in magnitude, in line with work suggesting that medium to large effects are unusual in personality development research (cf. Roberts et al., 2008). That said, even small changes in personality might still have an impact on significant life outcomes as occupational success, longevity, and health (Mroczek & Spiro, 2007). However, combined with the lack of significant effects for most traits, these modest effects further support the claim that divorce may have little influence on long-term personality development, similar to past work (Costa et al., 2000). Put differently, although our results speak to the fact that divorce can have a predictable small effect on personality change, we find no evidence that this major change experience necessarily portends manifold and long-standing "corruption" of the individual. To some, such results are perhaps surprising given the suggestion that divorce brings about widespread effects on well-being and self-concepts (Demo & Fine, 2010; Mastekaasa, 1992). However, considering divorce as a unitary construct may obscure the ultimate potential that this life experience has for influencing development. For example,

previous research indicates that individuals who initiated divorce tend to be better adjusted in the postdivorce period compared to those who did not want the divorce (Wang & Amato, 2000). Future studies may investigate individual differences variables such as attitudes toward divorce and coping strategies with respect to divorce and long-term personality development.

Limitations

Some limitations of this study are worth noting as directions for future work. First, this study sampled individuals at a relatively long distance from the date of the divorce. However, personality development is assumed to be a rather slow process, and the mechanisms that would drive life experiences, such as a divorce, to change personality traits most likely involve a continual environmental influence (Roberts et al., 2008). Moreover, the potential moderating role of the distance to the divorce was tested explicitly and we found no effects. Second, some of the lower order traits (e.g., unconventionality) evidenced lower than average reliabilities, likely because of less number of items and heterogeneous items in those respective narrow traits. Third, because of our study design, we focused only on potential socialization effects and thus cannot rule out the possibility that trait changes in response to divorce may result from selection effects. However, a recent study on personality development across 4 years found that divorced individuals did not differ from nondivorced individuals in terms of personality before the divorce (Specht et al., 2011).

Conclusion

This study suggests that divorce can help explain long-term individual differences in development of some personality traits. That said, our findings provide perhaps stronger evidence that although divorce is particularly disruptive on several levels, it may have little influence on our personality profiles in the long term. In this respect, individuals experiencing a divorce can take heart in the probability that this event will not serve to define who they are in the future. Such findings are particularly valuable for understanding family functioning following a divorce, suggesting that any children involved should not anticipate having to deal with increasingly erratic or inconsistent behavior from their parents in the future. Instead, even in a difficult period when everything else may be in flux, we tend to retain our dispositional characteristics in the long term, for better or for worse.

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