

## Reciprocal Associations between Parenting Challenges and Parents' Personality Development in Young and Middle Adulthood

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*Abstract:* Having children affects many aspects of people's lives. However, it remains unclear to what degree the challenges that come along with having children are associated with parents' personality development. We addressed this question in two studies by investigating the relationship between parenting challenges and personality development in mothers of newborns (Study 1,  $N = 556$ ) and the reciprocal associations between (mastering) parenting challenges and personality development in parents of adolescents (Study 2,  $N = 548$  mothers and 460 fathers). In Study 1, we found the stress of having a newborn baby to be associated with declines in maternal Agreeableness, Conscientiousness, and Emotional Stability. Parenting challenges were also related to personality development in parents of adolescent children in Study 2, with parent–child conflict being reciprocally associated with decreases in Conscientiousness and Emotional Stability. Mastering parenting challenges in the form of high parenting self-efficacy, on the other hand, was found to be associated with increases in Agreeableness, Conscientiousness, and Emotional Stability, and vice versa. In sum, our results suggest that mastering the challenges associated with the social role of parenthood is one of the mechanisms underlying personality development in young and middle adulthood. Copyright © 2013 John Wiley & Sons, Ltd.

Key words: personality development; stress; parent–child conflict; parenting self-efficacy; young adulthood; middle adulthood

Personality and social relationship are intrinsically interwoven (Back et al., 2011), with personality shaping social relationships (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Selfhout et al., 2010) and social relationships influencing personality development (Lehnart, Neyer, & Eccles, 2010; Scollon & Diener, 2006; Sturaro, Denissen, van Aken, & Asendorpf, 2008). For many people, the parent–child relationship is one of the most important and long-lasting social relationships in life. Although numerous studies have stressed the impact of having children on many aspects of parents' lives, such as marital quality (Twenge, Campbell, & Foster, 2003) and life satisfaction (Dyrdal & Lucas, 2013), its influence on parents' personality development has been surprisingly understudied. In addition, most studies on adult personality development have focused on young adulthood, and research on predictors of midlife personality development is largely lacking. In the present article, we conducted two studies to investigate the association between challenges associated with parenthood and parents' personality development in mothers of newborns (Study 1) and in mothers and fathers of adolescents (Study 2).

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### PERSONALITY DEVELOPMENT IN ADULTHOOD

Over the past few years, most personality psychologists have moved from the assumption that personality traits reach their mature form in the first third of life ('plaster hypothesis'; Costa & McCrae, 1994; McCrae & Costa, 1999) towards the idea that personality development continues across the life span (e.g. Field & Millsap, 1991; McCrae & Costa, 2008; Scollon & Diener, 2006; Srivastava, John, Gosling, & Potter, 2003). This shift has been influenced, among others, by a meta-analysis by Roberts and colleagues of 92 studies on this topic, in which they showed that normative (i.e. mean-level) changes are most prominent in young adulthood but can well continue into old age (Roberts, Walton, & Viechtbauer, 2006). People were found to show mean-level increases in Agreeableness, Conscientiousness, and Emotional Stability across adulthood, increases that have been described as demonstrating a so-called 'maturity principle' of personality development (Roberts & Wood, 2006). According to this principle, maturity is characterised by qualities that serve to enable adaptive functioning in society, which is thought to be reflected in high levels of Agreeableness, Conscientiousness, and Emotional Stability. However, not all individuals develop alike, and another meta-analysis by Roberts and colleagues showed that although rank-order stability increases over the life span, it never reaches perfect

stability, and non-normative changes are even possible in old age (Roberts & DelVecchio, 2000).

Moving beyond initial assumptions that personality solely develops through intrinsic maturation and other genetically shaped biological processes (e.g. McCrae & Costa, 2008), longitudinal behavioural genetic research consistently shows that personality change is the result of both genetic and environmental influences (Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2009; Kandler et al., 2010; McGue, Bacon, & Lykken, 1993). Studies on environmental influences have found personality development to be influenced by a broad range of environmental aspects, such as work experiences (Denissen, Asendorpf, & Van Aken, 2008; Scollon & Diener, 2006), romantic relationships (Lehnart et al., 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007), and the transition to parenthood (Jokela, Kivimäki, Elovainio, & Keltikangas-Järvinen, 2009).

According to the Social Investment Theory (Roberts & Wood, 2006; Roberts, Wood, & Smith, 2005), the environment influences personality development by providing social expectations with regard to age-graded social roles. These roles, such as finding a job and having children, come along with expectations that require a mature personality, that is, being agreeable, conscientious, and emotionally stable. Personality maturation is facilitated by the rewards that come with conforming to social expectations. Applying this to one of the most central social roles in adulthood, namely the role of being a parent, this would suggest that parents will show more personality maturation as a result of conforming to the social expectations regarding the role of parenthood. Because the aim of the present article was to investigate whether challenges associated with the parenting role are predictive of individual differences (i.e. rank-order changes) in the development of the traits that indicate a mature personality, we focused on the traits of Agreeableness, Conscientiousness, and Emotional Stability.

According to Roberts and colleagues, the opposite of the investment principle can also lead to personality changes. That is, de-investment in social roles may also lead to non-desirable personality changes. In a study on de-investment in the work role, they found counterproductive work behaviour, such as stealing from the work place, to be associated with less mature personality change (e.g. increases in negative emotionality; Roberts, Walton, Bogg, & Caspi, 2006). Other studies have found stressful life events to be associated with less personality maturation in adolescence (Laceulle, Nederhof, Karreman, Ormel, & Van Aken, 2011) and in emerging adulthood (Lüdtke, Roberts, Trautwein, & Nagy, 2011). In addition, a study among university students reported similar effects of daily hassles on personality development. Specifically, daily hassles predicted increases in Neuroticism over time (Vollrath, 2000).

Social roles often encompass both positive experiences and opportunities to act in a mature way as well as stressors that may lead to negative experiences and less mature conduct. This is especially true for the social role of parenthood, which goes along with many positive and joyful aspects (Belsky, 1986) but has been also found to be a source of psychological stress (Alexander, Feeney, Hohaus,

& Noller, 2001; McLanahan & Adams, 1987). Psychologists (Lodi-Smith & Roberts, 2007), sociologists (Hogan & Astone, 1986), and anthropologists (Schlegel, 2009) generally agree that parenthood is one of the most far-reaching transitional experiences during adulthood. Although early studies conceptualised this turning point as a crisis (LeMasters, 1957), more recent studies describe it as a normative developmental phase that is characterised by biological, psychological, and social changes (Levy-Shiff, 1994). But what are the consequences of these unique experiences and challenges for personality development? In the following, we will discuss previous studies with regard to the association between parenting challenges and parental personality in more detail.

## PARENTHOOD AND PERSONALITY DEVELOPMENT

The majority of studies on the association between parenthood and parental personality have focused either on the transition to parenthood or on the challenges associated with having young children. With regard to the former, Jokela and colleagues (2009) found that having a child is related to increased Neuroticism levels in parents, especially for those parents already having high baseline levels of Neuroticism. Moreover, the transition to parenthood was associated with an increase in Extraversion for men with high baseline Extraversion and with a decrease for men with low baseline Extraversion. However, this longitudinal study only examined the transition to parenthood as such and not the challenges and experiences that are associated with this transition.

Paris and Helson (2002) looked into the personality changes from age 21 to 27 years as a result of mothering experiences and found that mothers with positive parenting experiences showed an increase in ego-resiliency (flexibility and resourcefulness) and a decrease in feminine vulnerability (nurturance in a context of dependence and fearfulness), whereas the opposite pattern was found for women with negative parenting experiences. That is, mothers who experienced their new role to be gratifying and rewarding showed personality development towards more maturity, whereas the confrontation with challenges of motherhood in the form of frustration and disappointment led to less personality maturation. The changes associated with the transition to parenthood were also found to be associated with paternal personality. Hawkins and Belsky (1989) focused on the association between father involvement and paternal personality change across the transition to parenthood and surprisingly found that fathers of boys declined in self-esteem, especially when they were more involved as a parent. However, these authors only focused on the transition to parenthood and suggested that the decrease in self-esteem as a result of paternal involvement might be a transitory state in a longer process of personality development (i.e. much like a visit to the gym induces exhaustion yet over time leads to increases in stamina). That is, they assumed that mastering the difficulties associated with parenthood might eventually lead to personality maturation and called for studies capturing not only the transition to parenthood but also development beyond this transition. In line with this, a meta-analysis on social role

investment and personality development provided support for the importance of looking not only at social roles in demographic terms (i.e. the transition) but also in the psychological investment in these roles (Lodi-Smith & Roberts, 2007). That is, they emphasised that not the transition as such, but the degree of psychological investment into these social roles is crucial for personality development.

Van Aken and colleagues moved beyond the transitional period in young adulthood and investigated to what degree midlife concerns are associated with personality change in middle adulthood by focusing on the domains of work, family, and parenthood (Van Aken, Denissen, Branje, Dubas, & Goossens, 2006). With regard to the latter, they found parents' perception of the internalising problems of their adolescent child to be associated with decreases in Extraversion, Emotional Stability, and Agreeableness in fathers, but not in mothers. However, this study only examined concerns about parenting adolescent children, leaving it unclear whether being able to successfully master parenthood challenges might lead to more personality maturation.

## THE PRESENT STUDIES

In two studies, we tested whether parenting challenges are associated with parents' personality trait changes during two different phases of parenthood. In Study 1, we investigated to what degree the stress of having a newborn baby is associated with maternal personality development (reports on father personality were not available for this study). We expected that being overwhelmed by early parenting challenges is associated with less mature personality. That is, we hypothesised that mothers would show a decrease in Agreeableness, Conscientiousness, and Emotional Stability when they experience high levels of stress after having a baby.

To investigate whether the associations between parenting challenges and personality development can be generalised across different phases of parenthood, we focused on parents of adolescent children in Study 2. We expected parent-child conflicts to be associated with decreases in parental Agreeableness, Conscientiousness, and Emotional Stability. Parent-child conflict was assessed with parent-ratings as well as with child-ratings, allowing us to investigate whether results with self-ratings can be replicated with other-ratings to rule out shared method variance. In this study, we also examined the degree to which parents mastered the challenges of having adolescent children by looking at parenting self-efficacy, that is, parents' perceived ability to manage parenting tasks. We hypothesised that mastering parenting challenges in the form of high parenting self-efficacy would be associated with personality maturation: increases in Agreeableness, Conscientiousness, and Emotional Stability.

Finally, we expected stronger associations between early parenting challenges and personality change (Study 1) than between later parenting challenges and personality change (Study 2). Given the increase in rank-order stability between young and middle adulthood described earlier (Roberts & DelVecchio, 2000), there are more possibilities for parental personality changes in young adulthood (Study 1) than in

middle adulthood (Study 2). In addition, early parenting challenges during a transitional period (i.e. shortly after childbirth) require adaptation to a new social role and to a new family situation. In contrast, parents of adolescent children have already had more time to adapt to their parenting role. As a result, we expected associations between parenting challenges and personality changes to be stronger for mothers of newborns (Study 1) than for parents of adolescents (Study 2).

## STUDY 1

Although the stressfulness of daily life with young children has often been emphasised (e.g. Crnic & Greenberg, 1990), little is known about the associations between the stressors of parenthood and the development of broad personality traits. In Study 1, we analysed two-wave longitudinal data from a representative German household panel to investigate this association in young mothers. We expected the stress of having a newborn to predict decreases in Agreeableness, Conscientiousness, and Emotional Stability.

### Method

#### *Participants and procedure*

Analyses were based on data from the German Socio-Economic Panel Study (SOEP) of the German Institute for Economic Research (see Wagner, Frick, & Schupp, 2007 for details). SOEP is a representative longitudinal household study that started in 1984 and is currently in its 27th year. Households were initially selected using multistage random sampling with regional clustering. All household members 16 years and older were asked to take part in yearly assessments. The present analyses focused on mothers who were interviewed with regard to the experiences with their newborn child. The subsample used in the present study consisted of 625 mothers who gave birth between 2006 and 2009 and filled out both the 'Mother and Child Questionnaire' (see the Measures section) and the personality questionnaire. Mothers had an age range of 19–45 years ( $M = 31.5$ ,  $SD = 5.4$ ). A total of 556 mothers provided personality data both in 2005 and in 2009.

#### *Measures*

Maternal personality was assessed in 2005 and 2009 using a short version of the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). Given the large scope and multidisciplinary of SOEP, measures are required to be short in order to prevent participants from dropping out of the study. As a consequence, a 15-item version of the BFI was developed (BFI-S; Gerlitz & Schupp, 2005). Items were answered on a 7-point scale ranging from 1 (*does not apply at all*) to 7 (*applies perfectly*). In the subsample used in the present study, the average internal consistency of the three Big Five factors of interest across waves was  $\alpha = .52$  for Agreeableness,  $\alpha = .64$  for Conscientiousness, and  $\alpha = .59$  for Emotional Stability. To correct for the relatively low reliability of some of the BFI-S scales, personality traits were included as latent factors in our models, as was also carried out in previous studies using these data (Lucas & Donnellan, 2011; Specht, Egloff, & Schmukle, 2011).

Parenting challenges were measured using the Mother and Child Questionnaire, which has been assessed yearly in SOEP after 2003 (Schupp, Frischholz, & Schmitt, 2010). Principal component analysis of the items about changes after child birth revealed one factor measuring stress after having a child consisting of three items (Often close to running out of strength, Often unable to cope with tasks/responsibilities, and Suffering from being limited to the role of mother) that were answered on a 4-point scale from 1 (*do not agree*) to 4 (*completely agree*). The internal consistency was  $\alpha = .59$ . To disattenuate path coefficients, this scale was included as a latent factor in our models.

*Missing data*

We conducted Little’s missing completely at random test (R. J. A. Little, 1988) to examine randomness of missing data. The results were non-significant ( $\chi^2(339) = 319.92, p = .84$ ), suggesting that missing data were completely at random. In addition, attrition effects were tested by comparing dropouts with remaining participants. A total of 69 mothers who participated in 2005 did not participate in 2009 (11%). No attrition effects were found, as indicated by a lack of differences between dropouts and remaining participants with regard to Agreeableness, Conscientiousness, Emotional Stability, and parenting challenges.

*Analytic strategy*

The associations between parenting challenges and personality maturation were investigated using latent longitudinal regression modelling in Mplus version 6.11 (Muthén & Muthén, 1998–2010). Missing data were handled using full information maximum likelihood, in which all available data are used to estimate the model. Model fit was assessed by means of the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root-Mean-Square Error of Approximation (RMSEA), and the Standardised Root Mean Residual (SRMR; Hu & Bentler, 1998, 1999). CFI and TLI values of .90 or above and RMSEA and SRMR values of .08 or below indicate acceptable fit.

Personality in 2009 was regressed on personality in 2005 and parenting challenges. That is, significant effects of parenting challenges on personality in 2009 over and above the stability of personality traits indicate associations between parenting challenges and personality change. A graphical representation of the latent longitudinal regression model can be found in Figure 1. To ensure that change in the latent cross-lagged models was explained by trait development and not by variance in trait measurement over time, we analysed our models under strict factorial invariance. In case of strict factorial invariance, factor loading, intercepts, and residual variances are constrained to be equal across waves (Meredith, 1993). In addition, indicator residuals were allowed to correlate across waves. Fifty-four mothers (8.6%) had multiple newborns between 2006 and 2009 and filled out the Mother and Child Questionnaire more than once. To control for this non-independence of observations, mother ID was included as a cluster variable in those cases (Muthén & Satorra, 1995).

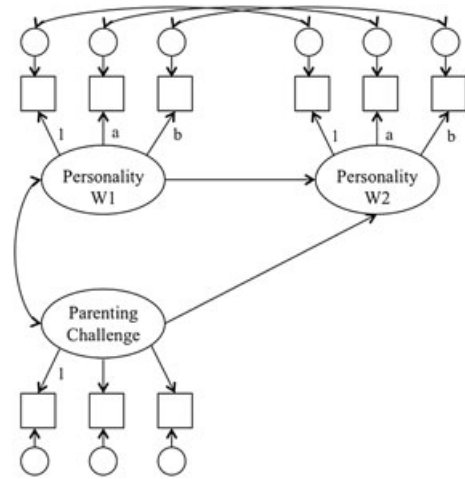


Figure 1. Conceptual latent longitudinal regression model of the associations between parenting challenges and personality traits. Factor loadings (a and b), measurement intercepts, and residual variances were constrained to be equal across waves, and indicator residuals were allowed to correlate over time.

**Results**

Estimation of the measurement models under strict factorial invariance resulted in good model fit (Table 1), suggesting measurement invariance over time. As a result, all subsequent models were estimated under strict factorial invariance. All further models also fit the data well (CFIs > .91, TLIs > .93, RMSEAs < .05, and SRMRs < .07).

Agreeableness, Conscientiousness, and Emotional Stability were rather stable across the 4-year period, with stability coefficients ranging from .50 to .74 ( $ps < .001$ ). In line with our hypothesis, parenting challenges predicted decreases in Agreeableness ( $\beta = -.18, p < .05$ ), Conscientiousness ( $\beta = -.19, p < .01$ ), and Emotional Stability ( $\beta = -.22, p < .01$ ). That is, the more stress mothers perceived of having a newborn child, the less agreeable, conscientious, and emotionally stable they became over time. We took the stability of these traits and the initial association with parenting challenges into account in our models, demonstrating that parenting challenges predict rank-order changes in maternal personality.

**Discussion**

Study 1 confirmed our expectations: Early parenting stress after childbirth predicted decreases in maternal Agreeableness, Conscientiousness, and Emotional Stability. This

Table 1. Fit indices for strict factorial invariance models for Study 1

	$\chi^2 (df)$	CFI	TLI	RMSEA	SRMR
Agreeableness	33 (13)	.940	.931	.050	.079
Conscientiousness	23 (13)	.973	.969	.036	.097
Emotional Stability	48 (13)	.910	.896	.067	.076

Note: CFI, Comparative Fit Index; TLI, Tucker–Lewis Index; RMSEA, Root-Mean-Square Error of Approximation; SRMR, Standardised Root Mean Residual.

indicates that the challenges associated with parenthood are one of the mechanisms underlying personality change in mothers in young adulthood. Personality changes have been suggested to result from dynamic interactions between individual characteristics and the environment (e.g. Fraley & Roberts, 2005). By its very nature (children being born between the two measures of personality), the design of Study 1 did not enable us to investigate possible reciprocal relationships between parenting challenges and personality development that follow from this assumption. To complement this picture, Study 2 was carried out.

## STUDY 2

Study 1 provided important insights into the association between parenting challenges and parental personality change. Yet, these results were limited to mothers in early adulthood. In Study 2, we therefore assessed a sample of fathers and mothers of adolescent children across three waves. The focus on this phase of parenthood allowed us to investigate whether parenting challenges are also associated with parents' personality development when children grow older. In addition, by using a three-wave design, we were now able to investigate the reciprocity in the association between parenting challenges and personality development. One of the major challenges for parents with adolescent children is parent-adolescent conflicts (Holmbeck, Paikoff, & Brooks-Gunn, 1995). We expected parent-child conflict to be reciprocally associated with decreases in Agreeableness, Conscientiousness, and Emotional Stability. In addition, Study 2 enabled us to investigate the relationship between the perceived ability to master parenting challenges and parents' personality development. We expected parenting self-efficacy to predict increases in Agreeableness, Conscientiousness, and Emotional Stability and vice versa.

## Method

### *Participants and procedure*

Participants were part of the Zagreb Personality and Parenting Longitudinal Study. The sample was recruited by contacting the parents of children attending Grades 4–8 in five randomly selected elementary schools in Zagreb, the capital of Croatia. Both the children and their parents were asked to take part in the study, and parental written consent was obtained for 720 children. There were three waves of data collection with approximately 1-year intervals. Children were assessed in their classroom in school, whereas the parents completed the questionnaires at home. In Wave 1, 548 mothers and 460 fathers took part in the study with ages ranging from 27 to 57 years for mothers ( $M=41.3$ ,  $SD=4.90$ ) and from 29 to 65 years for fathers ( $M=44.2$ ,  $SD=5.71$ ). Children were aged 9.9 to 15.5 years in Wave 1 ( $M=12.7$   $SD=17$  months). Participants with high socioeconomic status were overrepresented, with 42.8% of the fathers and 47.3% of the mothers having a college degree (compared with 9.0% and 8.0% on a national level; Croatian Bureau of Statistics, 2010).

### *Measures*

Parental personality was assessed at Waves 1–3 using the Croatian version of the 50-item International Personality Item Pool (Goldberg, 1999), which was developed using a back-translation procedure. Items were answered on a 5-point scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*). To obtain a measurement model similar to the model using the SOEP data in Study 1, items were parcelled into three aggregate-level indicators per scale. We applied the Item-to-Construct Balancing approach (T.D. Little, Cunningham, Shahar, & Widaman, 2002), in which the items with the highest loadings were used to anchor the three parcels for each of the three Big Five factors we were interested in (Agreeableness, Conscientiousness, and Emotional Stability). Subsequently, the items with the next highest factor loadings were added to the anchor items in inverted order until all items were assigned to a parcel. The average internal consistency across the three waves was  $\alpha=.79$  for Agreeableness,  $\alpha=.77$  for Conscientiousness, and  $\alpha=.86$  for Emotional Stability.

Parenting self-efficacy was measured using a 5-item scale adapted from the Parenting Sense of Competence Scale (Johnston & Mash, 1989). Items (e.g. I really believe I have all the skills necessary to be a good mother/father) were answered on a 4-point scale ranging from 1 (*completely disagree*) to 4 (*completely agree*). The average internal consistency across the three waves was  $\alpha=.78$ .

Parent-child conflict was measured using an extended version of the Parent-Adolescent Conflict Scale (Deković, 1999). The scale used in the present study consisted of 25 items (e.g. 'We quarrelled about my school grades') that were answered on a 4-point frequency scale ranging from 1 (*never*) to 4 (*very frequently*). Items were aggregated into five parcels using the same technique as for the Big Five. The questionnaire was filled out by both parents and the child. Models were first analysed using parent-ratings of conflict and subsequently with child-ratings, to investigate whether results are consistent across raters. The average internal consistency across the three waves was  $\alpha=.92$  for parent-reports and  $\alpha=.90$  for child-reports.

### *Missing data*

Results of Little's missing completely at random test (R.J.A. Little, 1988) turned out to be significant ( $\chi^2(6345)=6992.27$ ,  $p<.001$ ), suggesting that missing data on the study variables were not completely at random. This was not surprising, given that we had to deal with planned missingness. That is, parents of children who were eighth graders in Wave 1 were not contacted anymore in subsequent waves because they switched to secondary school. To compensate, additional fourth graders and their parents were included in the study. In Wave 1, 548 mothers and 460 fathers provided data. In Wave 2, 481 mothers and 418 fathers took part in the study, and in Wave 3, 336 mothers and 283 fathers participated. Attrition rates were 12.2% and 9.1% at Wave 2 and 30.1% and 32.3% at Wave 3 for mothers and fathers, respectively. Attrition effects were tested by comparing dropouts with remaining participants. Analysis of variance showed only one attrition effect: Mothers who dropped out of the study between Waves 1 and

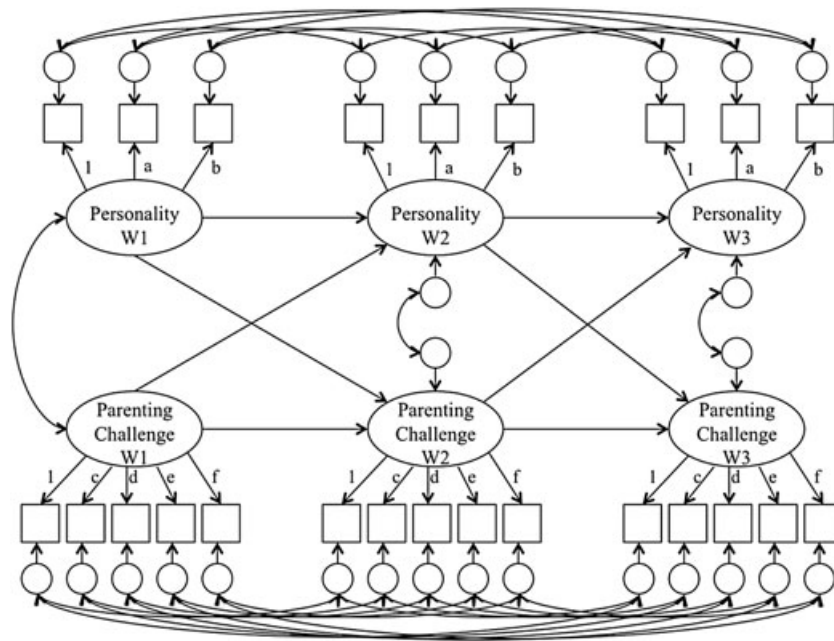


Figure 2. Conceptual latent cross-lagged model of the associations between the development of (mastering) parenting challenges and personality traits. Model results can be found in Table 3. Factor loadings (a–f), measurement intercepts, and residual variances were constrained to be equal across waves, and indicator residuals were allowed to correlate over time.

2 had slightly higher levels of conflict with their children than mothers who remained in the study ( $F(1, 654) = 4.30, p < .05, \eta_p^2 = .01$ ). Because the effect size was small (R.J.A. Little, 1988), it is unlikely to influence further analyses, apart from a potential underestimation of effects of mothers’ conflict due to restricted variance.

*Analytic strategy*

The reciprocal associations between parent–child conflict, parenting self-efficacy, and parents’ personality development were investigated using latent cross-lagged models in Mplus version 6.12 (Muthén & Muthén, 1998–2010). Missing data were again handled using full information maximum likelihood, and model fit was evaluated on the basis of the same fit indices as in Study 1 (i.e. RMSEA, TLI, CFI, and SRMR).

To test the reciprocal associations between the development of parent–child conflict and parental personality, we examined the cross-lagged effects from parent–child conflict to adjacent measurement points of personality, and vice versa. By estimating the stability of both constructs over time as well as their concurrent associations and the degree to which both constructs mutually influenced each other over time, we were able to investigate to what degree parent–child conflict predicted changes in personality traits over time, and vice versa. Similar models were analysed to investigate whether mastering parenting challenges in the form of parenting self-efficacy was reciprocally associated with parental personality over time. Separate models were estimated for each personality trait and for parent–child conflict and parenting self-efficacy (i.e. we estimated a total of  $3 \times 2 = 6$  models). In addition, the three models for parent-rated parent–child conflict were reanalysed with child-reports of parent–child conflict to rule out the possibility that potential findings were the result of shared method variance.

The links between personality traits and parenting variables were not expected to differ across time intervals. That is, we expected similar processes for the two 1-year intervals between Waves 1, 2, and 3. We therefore tested whether both the stability and cross-lagged paths could be constrained to be equal across measurement waves without worsening the model fit by means of chi-square difference tests (Kline, 2010). A decline in fit when fixing paths would indicate differences in associations across time, whereas a lack of change in model fit would indicate no differences across waves. In the latter case, the more parsimonious model with fixed effects across time was preferred.

In addition, gender differences were investigated by conducting multiple-group analyses. That is, the model was simultaneously specified for both male and female subsamples, and the between-subsample equality of model parameters was tested by chi-square difference test. Again, the more parsimonious model without gender differences was chosen in case of a nonsignificant  $\chi^2$  test. To control for the non-independence of observations of including fathers and mothers from the same families in our models, family ID was included as a cluster variable (Muthén & Satorra, 1995).

A graphical representation of the latent cross-lagged model can be found in Figure 2. Equal to the analyses conducted in Study 1, models were estimated under strict factorial invariance, and indicator residuals were allowed to correlate across waves.

**Results**

Strict factorial invariance held for all personality traits as well as for parent–child conflict and parenting self-efficacy, which was reflected in a good model fit for each of the five measurement models (Table 2). Consequently, all subsequent models

Table 2. Fit indices for strict factorial invariance models for Study 2

	$\chi^2$ (df)	CFI	TLI	RMSEA	SRMR
Agreeableness	68 (31)	.980	.977	.030	.054
Conscientiousness	36 (31)	.998	.998	.011	.035
Emotional Stability	69 (31)	.970	.965	.031	.064
Parenting Self-efficacy	152 (100)	.983	.982	.020	.045
Conflict—Parent Rating	409 (100)	.957	.955	.049	.042

Note: CFI, Comparative Fit Index; TLI, Tucker–Lewis Index; RMSEA, Root-Mean-Square Error of Approximation; SRMR, Standardised Root Mean Residual.

were estimated under strict factorial invariance. All further models also fit the data well (CFIs > .96, TLIs > .96, RMSEAs < .04, and SRMRs < .05).

Both personality and parental challenges were rather stable across the three waves, with stability coefficients<sup>1</sup> ranging from .73 to .80 for personality traits, from .74 to .77 for parent–child conflict, and from .73 to .76 for parenting self-efficacy (for all,  $p < .001$ ). Yet, there were significant cross-lagged effects while taking into account stability and concurrent correlations, suggesting that parent–child conflict and parenting self-efficacy predict changes in personality and vice versa. An overview of all cross-lagged coefficients can be found in Table 3.

In line with our expectations, we found negative cross-lagged effects in both directions between Emotional Stability and parent–child conflict ( $\beta = -.08$ ,  $p < .01$  for both effects). That is, high levels of conflict between parents and their adolescents predicted decreases in Emotional Stability. This appeared to be a reciprocal association, with Emotional Stability also predicting decreases in parent–child conflict. Gender differences were found for the cross-lagged effects between parent–child conflict and Conscientiousness, which was reflected in a significantly better fit for the model in which paths were freely estimated for mothers and fathers ( $\Delta\chi^2$  (2,  $N = 1301$ ) = 32.93,  $p < .001$ ). Fathers' conflict with their adolescent children was associated with a significant decrease in Conscientiousness over time ( $\beta = -.06$ ,  $p < .05$ ), whereas paternal Conscientiousness predicted a marginally significant decrease in father–child conflict ( $\beta = -.04$ ,  $p < .01$ ). For mothers, no significant cross-lagged paths were found from parent–child conflict to changes in Conscientiousness ( $\beta = -.02$ ,  $p = .44$ ) or vice versa ( $\beta = -.04$ ,  $p = .11$ ). Contrary to the expectations, parent–child conflict was not significantly associated with changes in Agreeableness ( $\beta = -.03$ ,  $p = .15$ ) or vice versa ( $\beta = .01$ ,  $p = .77$ ).

The cross-lagged associations between parenting self-efficacy and parental personality change also confirmed our hypotheses to a large extent. Parenting self-efficacy was

associated with growth in Agreeableness ( $\beta = .09$ ,  $p < .01$ ), which in turn predicted increases in parenting self-efficacy ( $\beta = .06$ ,  $p < .05$ ). Mastering parenting challenges in the form of parenting self-efficacy predicted an increase in parental Conscientiousness ( $\beta = .06$ ,  $p < .05$ ), but cross-lagged effects of Conscientiousness on changes in parenting self-efficacy did not reach conventional significance levels ( $\beta = .04$ ,  $p = .14$ ). Lastly, parenting self-efficacy was not significantly associated with changes in Emotional Stability ( $\beta = .02$ ,  $p = .46$ ). Emotional Stability did predict increases in parenting self-efficacy, but surprisingly, this was only the case between Wave 2 and Wave 3 ( $\beta = .19$ ,  $p < .001$ ), but not between Wave 1 and 2 ( $\beta = .04$ ,  $p = .34$ ). Fixing the cross-lagged paths from Emotional Stability to be equal between Wave 1 and Wave 2 and between Wave 2 and Wave 3 resulted in significant worse model fit ( $\Delta\chi^2$  (1,  $N = 1301$ ) = 10.42,  $p < .01$ ).

#### Supplementary analyses

In addition to parent-ratings of parent–child conflict, children were also asked to report on the conflict with their parents. To test the robustness of our conflict models and to investigate whether our results were due to shared method (reporter) variance, we reanalysed the cross-lagged models for the association between personality and child ratings of conflict with parents (Table 3). All models with child ratings fit the data well (CFIs > .97, TLIs > .97, RMSEAs < .03, and SRMRs < .05).

Stability coefficients for child ratings of conflict with parents were slightly lower than those with parent ratings, with values ranging between .67 and .68 across three waves (for all,  $p < .001$ ). Cross-lagged effects were similar to the models with parent ratings. Child reports on parent–child conflict predicted marginally significant decreases in parental Conscientiousness ( $\beta = -.04$ ,  $p < .10$ ), which confirms the results of parent ratings of conflict. Whereas parent ratings on parent–child conflict only predicted decreases in paternal Conscientiousness, this association was equal for mothers and fathers using child ratings. The negative cross-lagged association between Emotional Stability and parent-rated parent–child conflict was replicated using child ratings, although this association only reached a conventional significance level for fathers ( $\beta = -.06$ ,  $p < .05$ ). That is, children with emotionally stable fathers reported less conflict with their fathers over time. Finally, the lack of significant cross-lagged associations between child-rated parent–child conflict and Agreeableness were in line with our findings using parent ratings.

#### Discussion

Study 2 provided evidence for the assumption that parenting challenges are associated not only with parents' personality development in young parents but also with those in parents of adolescent children. In addition, results from Study 2 showed that reciprocal associations exist between parenting challenges and parental personality development, suggesting a transactional model. Specifically, parenting challenges in the form of parent–child conflict were found to be reciprocally associated with decreases in Conscientiousness and

<sup>1</sup>Parent–child conflict was slightly more stable for mothers than for fathers. Models in which stability paths for parent–child conflict were freely estimated for mothers and fathers fitted significantly better for the models for Agreeableness ( $\Delta\chi^2$  (1,  $N = 1301$ ) = 18.28,  $p < .001$ ) and Emotional Stability ( $\Delta\chi^2$  (1,  $N = 1301$ ) = 16.81,  $p < .001$ ). Stability coefficients for female and male participants in the model for Agreeableness and Emotional Stability were  $\beta_{\text{female}} = .81$ ,  $\beta_{\text{male}} = .71$  and  $\beta_{\text{female}} = .80$ ,  $\beta_{\text{male}} = .70$  ( $ps < .001$ ) respectively.

Table 3. Cross-lagged associations between parent-rated parent-child conflict, child-rated parent-child conflict, parenting self-efficacy, and parents' personality development in Study 2

	Personality trait					
	Agreeableness		Conscientiousness		Emotional Stability	
	Conflict P	Self-efficacy	Conflict P	Self-efficacy	Conflict P	Self-efficacy
Challenges → Personality	-.03 (.02)	.09** (.03)	♀ -.02 (.03) ♂ -.06* (.03)	.06* (.03)	-.08** (.02)	.02 (.03)
Personality → Challenges	.01 (.02)	.06* (.03)	♀ -.04 (.02) ♂ -.04† (.03)	.04 (.03)	-.08** (.03)	.04 (.04) <sup>1</sup> .18*** (.04)
	Conflict C	—	Conflict C	—	Conflict C	—
Challenges → Personality	-.04 (.03)	—	-.04† (.02)	—	♀ -.02 (.02) ♂ -.02 (.02)	—
Personality → Challenges	-.004 (.02)	—	.002 (.02)	—	♀ -.01 (.03) ♂ -.06* (.03)	—

Note: Values refer to standardised regression coefficients. Standard errors are in parentheses. The first value in the cell represents the coefficient for Wave 1 → Wave 2, and the second value represents the coefficient for Wave 2 → Wave 3.

Conflict P, conflict parent rating; Conflict C, conflict child rating.

<sup>1</sup>The cross-lagged effect of parenting self-efficacy on Emotional Stability differed significantly between Wave 1 and 2 and between Wave 2 and 3 ( $\Delta\chi^2(1, N=1301)=10.42, p<.01$ ).

† $p<.10$ , \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$ .

Emotional Stability. On the other hand, the perceived ability to master these challenges, as measured by parenting self-efficacy, was found to be reciprocally associated with personality maturation, reflected in increases in Agreeableness, Conscientiousness, and Emotional Stability.

An important strength of this study concerns the assessment of both parent and child ratings of conflict. Re-analyses of the parent-report models with child-reports partially replicated the findings, indicating that it is unlikely that our findings are the result of shared method variance.

## GENERAL DISCUSSION

Results from the present two studies showed that parenting challenges are associated with parents' personality development in young as well as in middle adulthood. In Study 1, we found parenting stress after having a baby to be associated with maternal decreases in Agreeableness, Conscientiousness, and Emotional Stability. In Study 2, we were able to partially replicate this association in a sample of parents of adolescent children: Parent-child conflict predicted decreases in Conscientiousness and Emotional Stability and vice versa. In addition, we found the perceived capability of mastering parenting challenges, as reflected by high parenting self-efficacy, to be reciprocally associated with personality maturation.

### Mastering parenting challenges and personality maturation

As hypothesised, we found the perceived mastering of parenting challenges, measured by parenting self-efficacy, to be associated with personality changes in the direction of greater maturation. More specifically, we found parenting self-efficacy to predict increases in parental Agreeableness over time. In addition, we also found reverse cross-lagged

effects: Agreeableness predicted increases in parenting self-efficacy, that is, in parents' perceived ability to accomplish parenting tasks. These results suggest a reciprocal interplay between the perceived ability to deal with parenting challenges and parental Agreeableness: Parents with high parenting self-efficacy become more agreeable over time, which in turn predicts subsequent increases in parenting self-efficacy.

Parenting self-efficacy also predicted increases in parental Conscientiousness. Yet, this turned out to be a one-directional relationship. That is, although mastering the challenges of parenthood is associated with increases in Conscientiousness, this trait does not predict changes in the perceived ability to master parenting challenges. This finding provides interesting insights to the broad literature and research on the trait of Conscientiousness. In fact, Conscientiousness has been shown to predict a variety of outcomes, varying from marital stability (Roberts & Bogg, 2004) to physical health (Friedman, 2000). The strongest associations have been found for work-related criteria, with Conscientiousness being the most important personality trait in the work context (Judge, Erez, Bono, & Thoresen, 2002). It is therefore interesting to see that higher levels in Conscientiousness can be rather considered a product than a predictor of a positive mastery of challenges in the parenting context.

Higher levels in Emotional Stability, on the other hand, can be rather considered a predictor than a consequence of a successful mastering of parenting challenges. Emotionally stable parents became more self-efficacious with regard to their parenting role over time, indicating an increase in their perceived ability to master the challenges of parenthood.

In sum, there largely seems to be a transactional association between the development of mastering parenting challenges and Agreeableness, Conscientiousness, and Emotional Stability in parents in middle adulthood. Parents who perceive themselves as being able to manage parenting challenges show personality changes in the direction of greater maturation, whereas mature personality predicts a growth in the perceived



mastery of parenting challenges. This is one of the first studies to provide empirical evidence for the assumption that cross-lagged associations exist between social roles and personality development in middle adulthood, which was also raised but not tested in previous studies (Van Aken *et al.*, 2006).

What are the mechanisms underlying these developmental processes? One promising candidate might be the improved ability to regulate one's emotions. In fact, previous research has found increases in emotion regulation across adulthood (Helson & Soto, 2005). Furthermore, the developmental patterns of emotion regulation showed striking similarities to those observed for personality traits. Specifically, investment in the work role was found to be associated with both more emotion regulation and personality maturation (Helson & Soto, 2005). These findings provide indirect evidence to suggest that self-regulation might play a role in the association between social role investment and personality development.

### Parenting challenges and personality development

As expected, we found parenting challenges to be associated with decreases in Agreeableness, Conscientiousness, and Emotional Stability, both in early adulthood (Study 1) and in middle adulthood (Study 2). In Study 1, we found the stress of having a newborn child to explain variance in young mothers' personality development over and above the stability of personality and its initial relation with parenting stress. This is in line with previous studies that have also found early parenting experiences to be associated with parental personality change (Hawkins & Belsky, 1989; Paris & Helson, 2002).

Similar to mothers of newborns, parents of adolescents showed decreases in Emotional Stability in association with parenting challenges in Study 2. Moreover, this association appeared to be reciprocal, because Emotional Stability predicted decreases in conflicts between parents and their adolescent children. This latter finding was partly replicated with child-reports, which showed that children of emotionally stable fathers reported a decrease in conflicts with their fathers over time.

In contrast to our hypotheses, no associations were found between parent-reported or child-reported parent-child conflict and Agreeableness. This finding is especially surprising when considering that of all Big Five personality traits, Agreeableness is most concerned with interpersonal relationships. Previous findings on the association between Agreeableness and conflict in adolescence and adulthood have found this trait to be of particular importance for conflict resolution (Graziano, Jensen-Campbell, & Hair, 1996; Jensen-Campbell & Graziano, 2001). In the present study, we only measured the frequency of parent-child conflict. However, it might be the case that not the frequency of conflicts but the way of dealing with conflicts plays an even more important role in relation to Agreeableness.

Reciprocal associations were found between parenting challenges and Conscientiousness. Patterns were similar for mothers and fathers, but cross-lagged associations only reached significance levels for fathers. Fathers who experienced conflicts with their adolescent children showed

decreases in Conscientiousness over time. The reverse was also true, with Conscientiousness predicting decreases in conflicts between fathers and their adolescent children.

Summing up, we revealed that parenting challenges are associated with personality changes in the direction of less maturation and vice versa. How can these associations be explained? According to the Social Investment Theory (Roberts & Wood, 2006), the investment and commitment to social roles stimulate personality maturation, whereas de-investment has opposite effects for personality development. From this perspective, decreases in Agreeableness, Conscientiousness, and Emotional Stability might be explained by de-investment in the social role of parenthood. However, parenting stress and parent-child conflict might not actually reflect de-investment in the parent role but rather challenges associated with this role. That is, they represent challenges or stressors with which parents are regularly confronted. Previous studies have also shown that the confrontation with stressful life events and daily stress are associated with less personality maturation (e.g. Lütke *et al.*, 2011; Specht *et al.*, 2011; Vollrath, 2000). This suggests that life challenges, either on a daily basis or in the form of stressful life events, can prevent people from developing a more mature personality.

Comparing the findings from our two studies reveals stronger and more consistent associations between parenting challenges and personality change in mothers of newborns (Study 1) than in parents of adolescents (Study 2). This is in accordance with our expectation that parenting challenges will predict more pronounced personality changes in young parents than in parents in middle adulthood because young parents are still adapting to their new social role and because of the lower rank-order stability in this phase of life. However, it should be noted that this difference might also be explained by other factors, such as differences in measures, culture, or time intervals between the current studies. There was a time interval of 4 years between the two waves of Study 1, whereas the three waves in Study 2 were assessed in 1-year intervals. As a result, there might have been more possibility for rank-order changes in Study 1 than in Study 2 (cf. Roberts & DeVecchio, 2000).

### Limitations and future research

By investigating parenting challenges in mothers of newborns as well as in parents of adolescents, the present research provides important insights into the associations between these challenges and parental personality changes in young and middle adulthood. However, some questions could not be answered with the current designs, and future studies might want to address these open questions. First of all, Study 1 was limited to mothers, leaving it unknown to what degree similar associations can be found in fathers of newborns. In addition, future studies on young parents might want to use a three-wave design and to include a measure of mastering parenting challenges (self-efficacy) to investigate whether the transactional associations between (mastering) parenting challenges and personality change in middle adulthood found in our second study can be generalised to young parents of

newborns. Related to this, the design of the present studies did not enable a direct comparison of the association between parenting challenges and personality development in young and middle adulthood. Longitudinal studies covering the development of the same individuals across adulthood are needed for that purpose.

In addition, personality and parenting challenges were measured over relatively long time intervals in the present studies. However, parents are confronted with parenting challenges on a daily basis, which was not captured by the design of our studies. These daily challenges might elicit changes in states and behaviours, leading to stable trait changes over time. This is in line with bottom-up approaches such as the sociogenomic model of personality (Roberts & Jackson, 2008), which suggest that environments do not directly influence personality traits but affect behavioural changes, which lead to personality changes. Supporting this perspective, Bleidorn (2012) showed that changes in achievement behaviour are associated with personality changes in emerging adults. Future studies might want to elaborate on this by investigating whether parenting challenges are associated with stable trait changes in personality through behavioural and state changes.

Another methodological point concerns the causality question. Although cross-lagged models can provide information as to whether challenges experienced at one point predict subsequent changes in personality, no causal conclusions can be drawn from these models. Given the bidirectional cross-lagged paths found in the present study, the results are best interpreted as parenting challenges and personality mutually influencing each other over time.

The present studies only investigated the association between parenting challenges and personality development of parents. However, parenting challenges are likely associated not only with the personality traits of the parents but also with those of the children. Several early developmental theories, such as Patterson's (1982) model of coercive parenting and Belsky's (1984) process model of parenting, already acknowledged the transactional process between parents' and children's personality in their mutual relationship, which was supported with strong empirical evidence from recent multi-informant and behavioural genetic studies (Denissen, Van Aken, & Dubas, 2009; Riemann, Kandler, & Bleidorn, 2012). The focus of the present study was on how challenges perceived by parents influence the stability and change of their personality, but future studies might want to incorporate the personality of the child as well to investigate how this influences parenting challenges.

This paper covered the associations between parenting challenges and parental personality in the early phase of parenthood (i.e. in mothers of newborns) as well as during a later phase (i.e. in parents of adolescents). There might be further periods in parenthood that are crucial to personality development, for example, when children leave the parental home. This transition has been associated with the so-called 'empty nest syndrome', which refers to experiences of depression and emotional distress when children move out (Mitchell & Lovegreen, 2009). Future studies could elaborate on this by investigating to what degree the challenges of experiencing an

empty nest as well as the ability to deal with these challenges are associated with parental personality changes.

In addition, although the focus of the present article was on challenges in the social role of parenthood, similar results might be expected in other social roles. People are dealing with multiple roles simultaneously in adult life. Future research might want to investigate how dealing with challenges in multiple roles at the same time (e.g. being a working parent) is associated with personality development.

## Conclusions

Results from the present research show that (mastering) parenting challenges are associated with parental personality changes in young as well as in middle adulthood. Specifically, parenting challenges were found to be reciprocally associated with decreases in Agreeableness, Conscientiousness, and Emotional Stability, whereas mastering these challenges was associated with increases in these traits. Our findings show that the challenges associated with parenthood play a role in personality development in parents in early as well as middle adulthood. Therefore, it seems fair to conclude that successful mastering the challenges that come along with the social role of being a parent is one of the mechanisms underlying personality development during this period of the lifespan.

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