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Parent–offspring Similarity in Personality and Adolescents' Problem Behaviour

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Abstract

Similarity in personality between adolescents and their parents may have considerable implications for adolescent well-being. We studied how the similarity in personality between 288 adolescents and their parents is linked to adolescent problem behaviour, and whether this link is mediated by warmth and control in the parent–child relationship and moderated by the personality type of the adolescent. Similarity in personality between adolescents and their parents was negatively related to internalizing and externalizing problem behaviour, both concurrently and over time. This relation was not mediated by the parent–child relationship. The effects were present for overcontrolled but not for resilient or undercontrolled adolescents. Copyright © 2004 John Wiley & Sons, Ltd.

Success or failure in life is influenced by personality characteristics (Kokko, Bergman, & Pulkkinen, 2003). The relation of person characteristics to depressive symptoms and antisocial behaviour has been investigated a number of times. Depression in late childhood and adolescence has been associated with low scores on Emotional Stability (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003; Dunkley, Blankstein, & Flett, 1997; Ehrler, Evans, & McGhee, 1999; Huey & Weisz, 1997; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994) and with low scores on Extraversion (Huey & Weisz, 1997; John et al., 1994). Externalizing or antisocial behaviour has been found to be related to low scores on Agreeableness (Ehrler et al., 1999; Heaven, 1996; Huey & Weisz, 1997; John et al., 1994), to low scores on Conscientiousness (Barbaranelli et al., 2003; Ehrler et al., 1999; Heaven, 1996; John et al., 1994), to high scores on Extraversion (Huey & Weisz, 1997; John et al., 1994) and to low scores on Emotional Stability (Barbaranelli et al., 2003; Heaven, 1996). Persons low on Agreeableness, Extraversion, and Emotional Stability (Robins, Caspi, & Moffitt, 2002) or Conscientiousness (Kurtz & Sherker, 2003) have difficulties with the

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attainment and maintenance of relationships, whereas persons low on Conscientiousness have problems with achievement (Barbaranelli et al., 2003; Shiner & Caspi, 2003) and school adjustment (Graziano & Ward, 1992). However, individual characteristics are not the sole determinants of adjustment to the environment. Children develop within a family context and are influenced by characteristics of important others in that context, especially the characteristics of their parents. Individual characteristics elicit reactions from other persons in the environment, and these reactions, in turn, form feedback for the individual (Caspi, 1998; Scarr & McCartney, 1983), and influence the individual's development. Resemblance in personality characteristics to other persons in the environment, especially parents, may increase the chance that the demands and expectations that parents place on their children are appropriate. Several investigators have stressed the importance of the 'goodness of fit' between individual and contextual characteristics (Lerner, 1984; Seifer, 2000; Thomas & Chess, 1977). If parents' demands and expectations are congruent with the characteristics of the adolescent, this results in a good fit between parents and the adolescent, resulting in an increased likelihood that the adolescent will develop more optimally. If characteristics of the adolescent and parents' demands are incongruent, however, the adolescent will have difficulty in adjustment and development. The central question in this study is what the consequences of parent–offspring similarity in personality for adolescent adjustment are, especially with respect to internalizing and externalizing problem behaviours.

The match between individual characteristics among dyads has been studied from several perspectives. For example, there is sufficient evidence that in non-clinical samples there is significant albeit low to moderate similarity in personality between spouses (Caspi, Herbener, & Ozer, 1992; Dubuis-Stadelmann, Fenton, Ferrero, & Preisig, 2001; Feng & Baker, 1994; Nagoshy, Johnson, & Honbo, 1992). This similarity is not the result of the relationship but seems to have its origin in initial similarity of the spouses (Caspi et al., 1992; Feng & Baker, 1994). This means that individuals who are more similar are more likely to select each other as partners. This finding is confirmed in behavioural genetic research in which 'assortative mating' refers to this tendency for spouses to be similar (Nagoshy et al., 1992; Plomin, 1990). Spouse similarity does more than influence partner selection. Personality similarity between partners has positive consequences for marital stability and marital satisfaction (Arrindell & Luteijn, 2000; Nemechek & Olson, 1999; Russell & Wells, 1991; Weisfeld, Russell, Weisfeld, & Wells, 1992) and subjective well-being (Arrindell & Luteijn, 2000).

Parallel with research on spouse similarity, research on peers shows greater similarities between friends than between nonfriends on a range of behaviours, including prosocial and antisocial behaviour, shyness, victimization, depressive symptoms, and sociometric status (Haselager, Hartup, Van Lieshout, & Riksen-Walraven, 1998). Children who resemble each other in aggression and withdrawn behaviour are more likely to become friends than children who are not similar (Kupersmidt, DeRosier, & Patterson, 1995). In sum, the similarity of two relationship partners seems to be an important aspect of the quality of the relationship and of the functioning of the partners.

In contrast to children and adults, who choose their friends and partners, parents and children are involuntary partners in a long-lasting relationship. Although heritability estimates based on twin studies report moderate effect sizes (Spinath & O'Connor, 2003), several reviews estimate the overall correlation for parent–offspring similarity in personality as low (around $r = 0.10$: Bratko & Marusic, 1997; Rowe, 1994). Moreover, the degree of similarity in personality between parents and their children varies depending

on the particular personality characteristic. Bratko and Marusic (1997), for instance, found significant father–offspring correlations for openness ($r = 0.19$) and conscientiousness ($r = 0.21$) but no significant father–offspring correlations for the other three personality dimensions agreeableness ($r = 0.10$), extraversion ($r = 0.07$), and neuroticism ($r = 0.05$). For mother–offspring similarity only the correlation for neuroticism ($r = 0.18$) was significant, whereas the correlations for the other four personality dimensions were not significant and ranged from $r = -0.02$ for extraversion to $r = 0.04$ for openness. Moreover, the mean correlation in parent–offspring similarity does not take into account the variability in parent–offspring similarity between families.

With regard to the consequences of parent–offspring similarity there is some, although limited, evidence for positive consequences. From an evolutionary perspective, parent–child similarity signals to the parent that the child carries the parent's genes and hence detecting this similarity should result in greater parental investment (Dubas & van Aken, in press). Hypothetical parental investment is greater for children who show more physical similarity to the investor than for children who show less similarity (Burch & Gallup, 2000; Platek, Burch, Panyavin, Wasserman, & Gallup, 2002). From a family systems perspective, similarity between family members in their perception of the family creates stability and social support for their developmental needs (Carlson, Cooper, & Sprandling, 1991) and is an indicator of a well functioning family (Lanz, Scabini, Vermulst, & Gerris, 2001). If important others, like parents, have the same characteristics as their child, it could be easier to maintain a supportive relationship, even during a potentially stressful transition period such as adolescence.

Although the issue of similarity between individuals has been studied from several perspectives, until now there has not been much research attention for the consequences of parent–offspring similarity in personality on adolescent adjustment. Hence, the first goal of this study is to examine whether similarity in personality between parents and adolescents is related to concurrent psychosocial adjustment, and whether similarity in personality contributes over time to changes in psychosocial adjustment. Based on findings from the family system research (Carlson et al., 1991; Lanz et al., 2001) mentioned above, we expect that parent–offspring similarity in personality will have positive consequences for adaptation while parent–adolescent dissimilarity will have negative consequences. Specifically, we expect that less similarity in personality between a parent and an adolescent is related to more adolescent internalizing and externalizing problems and that these problems may increase over time.

Assuming that there is a relation between parent–adolescent similarity in personality and problem behaviour, the next question is how this relation can be explained. It is not likely that dissimilarity in personality elicits problem behaviour directly. In his process model concerning the determinants of parenting, Belsky (1984) hypothesized that child-rearing behaviour or parent–child interactions were important mediators between parental characteristics and child outcomes. In a replication study of some components of Belsky's model, Gerris, Dubas, Janssens, and Vermulst (2000) found strong evidence for main effects of parental personality on parenting. Comparing parents who were either at the top or bottom third of the distribution on the Big Five dimensions, group differences in both restrictive and democratic/nurturant parenting were found on all five personality dimensions. For example, fathers who were low in emotional stability were more restrictive and punitive in their parenting, compared with fathers who were high in emotional stability. Fathers who were high in each personality dimension were more democratic in their parenting than their counterparts who were low in each dimension. For

mothers, low levels of extraversion, emotional stability, openness, and agreeableness were associated with higher restrictive parenting compared with mothers who were high in these dimensions. Additional studies have also found links between neuroticism (low emotional stability) and lower levels of nurturance (Belsky, Crnic, & Woodworth, 1995; Kochanska, Clark, & Goldman, 1997; Metasapelto & Pulkkinen, 2003), between higher levels of extraversion and greater nurturance (Belsky et al., 1995; Metasapelto & Pulkkinen, 2003), and between openness and restrictiveness (Metasapelto & Pulkkinen, 2003). In a recent study by Prinzie et al. (2004) most of the relationships between parental personality and child externalizing problem behaviours were mediated by dysfunctional parenting practices, except for Emotional Stability and Openness. There is also evidence that child resemblance in personality is linked to the quality of the parent–child relationship. Greater similarity in personality between parents and their late adolescents predicts higher emotional attachment of offspring to their parents (Fox, 2000). Therefore, the second purpose of this study is to explore whether the quality of the relationship between parent and adolescent mediates the relation between parent–offspring similarity in personality and behavioural problems. In this study the quality of the parent–child relationship is represented by two general dimensions of parenting practices: warmth and restrictive control (Maccoby & Martin, 1983). We expect that similarity in personality has an impact on the quality of the relationship by improving parental warmth and decreasing restrictive control; this in turn decreases the chances for the development of problem behaviour during adolescence. In contrast, we expect that less similarity in personality between parents and adolescents will result in less smooth interactions, leading to relationships that are less supportive for the adolescent, and that can result in the adolescent withdrawing or feeling depressed (internalizing behaviours), or opposing and behaving aggressively (externalizing behaviours). We assume that the quality of the relationship with the parents is the link between similarity in personality and behavioural problems.

If similarity in personality has consequences for problem behaviour, then it should be fruitful to search for circumstances that influence this relation either positively or negatively. An example of such a moderator is the personality type of the adolescent. Recent research suggests that integrating children's personality characteristics within parenting models improves the prediction of parenting (Clark, Kochanska, & Ready, 2000) and individual differences in children's externalizing problem behaviours (Prinzie et al., 2003). Instead of using children's personality characteristics, several researchers (Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001; Caspi, 1998; Hart, Hofmann, Edelstein, & Keller, 1997; Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996) have proposed to use personality types, based on consistently strong evidence for three personality types in their studies. A third purpose of this study is to examine whether the link between parent–offspring similarity in personality and problem behaviour is moderated by differences in the type of child personality. Patterson and Bank (1989) posited that if children with a difficult temperament are reared in problematic families, both child and family functioning worsen as a consequence. However, if children with a difficult temperament are reared in competent families, children will develop less problematically and the family remains competent. Thus, coercive cycles emerge from the combination of insensitive, inflexible, and coercive parenting with difficult, confrontative children. Consequently, similarity in personality between 'difficult' parents and children may not be beneficial for the development of the child.

Among older children and adolescents, three broad personality types have been distinguished based on combinations of personality dimensions: resilients, overcontrollers,

and undercontrollers (Asendorpf, 2002, 2003; Asendorpf et al., 2001; Caspi, 2000; De Fruyt, Mervielde, & Van Leeuwen, 2002; Dubas, Gerris, Janssens, & Vermulst, 2002; Scholte, Van Lieshout, de Wit, & van Aken, in press; van Aken & Dubas, in press). Resilient individuals are above average on extraversion, agreeableness, conscientiousness and openness and high on emotional stability. Overcontrollers are low on emotional stability and extraversion and high on conscientiousness, and have a tendency toward inhibitional and internalizing problems. Undercontrollers, in contrast, are low on conscientiousness and agreeableness and have a disposition for externalizing problems. Thus, resilient children are less prone to behaviour problems than both under- and overcontrollers. Because one of the characteristics of resilient children is that they adapt easily to their environments, we do not expect a link between personality similarity and children's adjustment for this personality type. For overcontrolled, inhibited children, we expect a link between similarity in personality type with the parents to be found for internalizing problem behaviours. Specifically, the more overcontrolled children resemble their parents, the fewer internalizing problems these children will exhibit as we expect a greater fit between the parenting these children receive and their behaviour. Based on the description of amplifying effects of characteristics of both parents and children by Patterson and Bank (1989), for undercontrolled, impulsive children similarity in personality with the parents should be positively linked with externalizing problem behaviour. Thus, we expect that the association between parent–offspring similarity and internalizing and externalizing problem behaviour might vary for different personality types.

In summary, the present study has three research purposes. First, we examine whether similarity in personality between adolescents and their parents relates to problem behaviours of the adolescents, both concurrently and prospectively over two years. Second, we examine whether the link between personality similarity and problem behaviour is mediated by the quality of the relationship between the parent and adolescent. Finally, we examine whether adolescent personality type moderates the relationship between parent–adolescent personality similarity and concurrent adolescent problem behaviours.

METHOD

Design

The data in this study are part of a longitudinal study, the Nijmegen Family and Personality Project (Haselager & Van Aken, 1999). Data from two waves were used to answer the research questions. The time span between the two waves was 2 years. In Wave 1, adolescents reported on their personality characteristics, problem behaviour, and quality of their relationship with their parents. Parents reported on their own personality characteristics and the problem behaviours of their adolescents. In Wave 2, both adolescents and parents reported on the problem behaviours of the adolescents.

Participants

Participants were drawn from a nationally representative sample of 285 families consisting of two parents and at least two adolescents in the Netherlands. For the present study

we focus on data from these families that were gathered in 1997 (Wave 1) and in 1999 (Wave 2). To prevent dependency of the data, only one child per family was randomly selected for the analyses. The present sample consisted of 139 boys (48.3%) and 149 girls (51.7%) with full data at both waves of measurement. Attrition in this study was rather low with only three families not participating across the two measurement waves (1% attrition). At Wave 1, the mean age of the adolescents was 13.5, ranging from 11.1 to 16.0 years. The mean age of the fathers at Wave 1 was 43.9 years, ranging from 34.0 to 56.1 years. Mothers were on average 41.7 years old, varying between 34.0 and 51.2 years. Of the parents, 96% were of Dutch origin. Forty per cent of the fathers and 28% of the mothers had completed higher education or university.

Procedure

Two-parent families with at least two adolescent children (11–16 years) were identified through municipal registers in the Netherlands. Qualifying families were recruited via a letter describing the study and requesting participation. Of these families, 50% were willing to participate, resulting in 288 families participating in the first wave of the study.

At each time of assessment, family members were visited at home. The interviewer asked both parents and adolescents to concurrently complete the questionnaires. The interviewer stayed with the family until everyone had filled in the questionnaire and ensured whether the questionnaires were completed separately by the family members. Adolescents received a cd voucher for their participation.

Measures

Personality

Personality was measured with a Dutch adaptation of the Big Five questionnaire (Goldberg, 1992). In preceding studies the original unipolar 100 markers were reduced to 30, six markers for each of the five personality factors (Gerris et al., 1998). Fathers, mothers, and adolescents filled out the shortened version about themselves on a seven-point scale.

Extraversion measures the extent to which someone is socially active versus inhibited (sample items: talkative, reserved (reverse coded)). Agreeableness measures the degree to which the individual has interest and concern for others (e.g. sympathetic, kind). Conscientiousness measures the organization, persistence, and motivation in goal-directed task behaviour (e.g. careful, organized). Emotional Stability–Neuroticism measures the regulation of emotions and whether an individual is emotionally stable versus unstable (e.g. anxious (reverse coded), nervous (reverse coded)). In this study high scores indicate high emotional stability. Openness to Experience measures the flexibility of information processing and creativity (e.g. imaginative, creative). Internal consistencies (Cronbach's alphas) of these personality factors ranged from 0.66 to 0.83 for adolescents, from 0.80 to 0.89 for mothers, and from 0.81 to 0.88 for fathers.

Quality of the parent–adolescent relationship

The Relational Support Inventory (Scholte, van Lieshout, & van Aken, 2001) was used to assess the quality of the relationships between the adolescents and their fathers and mothers. The questionnaire was based on nine aspects of relationship quality and consisted of 27 items. Adolescents reported on a five-point scale the extent to which each item applied to their fathers and their mothers. Principal factor analyses on these nine aspects

followed by oblique rotation were used to extract the two central dimensions of warmth and control. Two aspects (hostility and withholding information) were excluded due to low factor loadings. This resulted in a clear factor pattern with loadings between 0.5 and 0.9 on the principal factors and low cross loadings between −0.12 and 0.08. The percentages of explained variances by the two factors were 47.1 (adolescents about their father) and 47.0 (adolescents about their mother). The first factor, warmth, contains four aspects: giving information (e.g. 'This person makes clear why he/she thinks something is wrong, or why something is not allowed.'), emotional support/ warmth ('This person shows that he/she loves me.'), acceptance ('This person takes me as I am.'), and respect for autonomy ('This person allows me as much as possible to make my own decisions.'). The second factor, restrictive control, consists of three aspects: setting limits ('This person wants me to act precisely as he/she wishes: he/she gives me commands and orders.'), convergence of central goals ('This person criticizes my ideas of religion, conviction or societal involvement.'), and convergence of peripheral goals ('This person comments on my taste, e.g., my clothing.'). Higher scores on these factors indicate more warmth and less control, respectively. Two subscales (hostility and withholding information) were excluded due to low factor loadings. The internal consistencies (Cronbach's alpha) of the two new scales were 0.82 and 0.85 for warmth (12 items) from mother and father respectively, and 0.73 for control (nine items) from both parents.

Problem behaviour

To assess internalizing and externalizing problem behaviour, the Nijmegen Problem Behaviour List (NPBL) was used. Items are formulated to represent problem behaviour (withdrawn, anxious/depressed behaviour for the internalizing scale, aggressive and delinquent behaviour for the externalizing scale) in a non-clinical setting (De Bruyn, Vermulst, & Scholte, submitted). The NPBL contains 16 items on a five-point scale and is validated as a self-report measure and as an other-report measure. Internalizing behaviour is measured with nine items (sample items include 'I withdraw from others' (worded for self-report); 'My child feels sad, unhappy' (worded for parent report)). Cronbach's alpha varies from 0.81 to 0.88 for the different versions in Wave 1 and Wave 2. Externalizing behaviour is measured with seven items (e.g. I readily threaten others with violence; I cheat others). Cronbach's alpha varies between 0.77 and 0.89. Internalizing and externalizing problem behaviour of the adolescent was reported by adolescents, fathers, and mothers. The correlations between the different informants were moderate, with father–mother reports correlating between $r = 0.37$ and $r = 0.40$, father–adolescent reports between $r = 0.26$ and $r = 0.35$, and mother–adolescent reports between $r = 0.26$ and $r = 0.34$.

Parent–offspring similarity in personality: the Q-correlation

In our study we focus on the objective match in self-reported personality characteristics. That is, we used a statistical method to calculate similarity in personality dimensions, a Q-correlation, and define this as an objective fit index. The Q-correlation does not report on a group (like a Pearson correlation coefficient) but on a dyad, and indicates profile similarity. The Q-correlation was computed over 30 items of each adolescent with father and mother, separately, resulting in a dyadic correlation for the father–adolescent dyad and for the mother–adolescent dyad. This correlation has a range between −1 and +1. A higher score means more similarity in personality profiles of the adolescent and his/her father or mother.

RESULTS

Parent–offspring similarity in personality

The mean similarity between the adolescent and the parent was moderate, with an average correlation of 0.30 for similarity with father and 0.33 for similarity with mother. The range in similarity was considerable: ranging from −0.60 to 0.97 for adolescent–father dyads, and −0.46 to 0.93 for adolescent–mother dyads. This range indicates that there are substantial interfamily differences in similarity between the personality of the adolescent and that of his/her father or mother. Similarity with father or mother did not differ between boys and girls.

The correlation between the adolescent–father and adolescent–mother similarity is moderate ($r = 0.38$; $p < 0.01$) and indicates that the similarity of the adolescent to his/her parents is specific for each relationship. For example, the similarity with the mother can be high while at the same time the similarity with the father is low, or vice versa.

Similarity of the adolescent with the father or mother was positively correlated with each of the Big Five personality characteristics of the adolescent (mean correlation = 0.28). The higher the similarity in personality of the adolescent and his/her father (f) or mother (m), the more extraverted (f, $r = 0.33$; m, $r = 0.35$), agreeable (f, $r = 0.27$; m, $r = 0.37$), conscientious (f, $r = 0.25$; m, $r = 0.30$), emotionally stable (f, $r = 0.36$; m, $r = 0.29$), and, to a lesser extent, open to experience the adolescent was (f, $r = 0.20$; m, $r = 0.10$).

Parent–offspring similarity and problem behaviour

Table 1 shows the mean problem behaviour scores and standard deviation for each informant. Our first question was whether similarity in personality was concurrently related to a lower level of internalizing and externalizing problem behaviour of the adolescent. The Q-correlation for similarity was correlated with the parent-reported and adolescent-reported problem behaviour measure for externalizing and internalizing behaviour problems. More similarity in personality corresponded with a moderately lower level of concurrent internalizing and externalizing problem behaviour (Table 2). When the other parent's report on adolescent problem behaviour was used, no correlations between

Table 1. Means and standard deviations of externalizing and internalizing problem behaviour of adolescents

	N	Mean	Standard deviation
W1 Ext self	287	1.55	0.52
W1 Int self	288	2.14	0.64
W1 Ext father	288	1.42	0.48
W1 Int father	288	2.07	0.60
W1 Ext mother	288	1.33	0.42
W1 Int mother	288	2.07	0.62
W3 Ext self	284	1.53	0.58
W3 Int self	283	2.06	0.68
W3 Ext father	285	1.43	0.49
W3 Int father	285	2.01	0.58
W3 Ext mother	283	1.32	0.41
W3 Int mother	283	1.94	0.59

W1/W3: Wave 1/Wave 3.
Ext: externalizing problem behaviour/Int: internalizing problem behaviour.
Self: self-report/father: father report/mother: mother report.

Table 2. Pearson's correlations between similarity in personality between parent and adolescent at Wave 1 and concurrent internalizing and externalizing problem behaviour of the adolescent

	Internalizing problem behaviour reported by		
	Adolescent	Father	Mother
Similarity to father	−0.31**	−0.21**	−0.15**
Similarity to mother	−0.29**	−0.08	−0.22**
	Externalizing problem behaviour reported by		
	Adolescent	Father	Mother
Similarity to father	−0.12*	−0.12*	−0.06
Similarity to mother	−0.24**	−0.07	−0.17**

*$p < 0.05$ (one tailed); **$p < 0.01$ (one tailed).

similarity and adolescent problem behaviour were found except for mother's reports on internalizing problem behaviours and father–child personality similarity. Because similarity was positively related to the Big Five personality characteristics of the adolescent, we regressed similarity on problem behaviour while controlling for personality in a first step. The results showed that similarity was significantly related to internalizing and externalizing behaviour as reported by fathers and mothers even after effects of personality were taken into account. Similarity did not contribute significantly to self-reported problem behaviour after controlling for personality, however.

To investigate whether parent–offspring similarity at Wave 1 contributed to change in problem behaviour between Wave 1 and Wave 2, hierarchical regression analyses were used in which problem behaviour at Wave 1 was entered on the first step and parent–child personality similarity was entered on the second step. Again these analyses were executed separately for both internalizing and externalizing problems and separately for parent and adolescent reports on adolescent problem behaviour. The results of the hierarchical regression analyses (Table 3) consistently differed according to who was reporting problem behaviour (adolescent or parent) and whether the similarity with father

Table 3. Regression analyses predicting externalizing and internalizing problem behaviour over time (Wave 2) with Wave 1 problem behaviour and similarity in personality between the adolescent and father or mother: R^2 change per step and standardized beta coefficients

Reported by:	Self		Father		Mother	
	R^2 change	β	R^2 change	β	R^2 change	β
Step 1: externalizing problem behaviour wave 1	0.25**	0.50**	0.41**	0.64**	0.25**	0.50**
Step 2: similarity father–adolescent	0.01*	−0.09*	0.00	−0.02		
Step 2: similarity mother–adolescent	0.00	0.03			0.01*	−0.09*
Step 1: internalizing problem behaviour wave 1	0.29**	0.54**	0.49**	0.70**	0.42**	0.65**
Step 2: similarity father–adolescent	0.01*	−0.09*	0.00	−0.01		
Step 2: similarity mother–adolescent	0.01	−0.07			0.01*	−0.12**

*$p < 0.05$ (one tailed); **$p < 0.01$ (one tailed).

or mother was considered. More similarity in personality between father and adolescent was related to a consequent decrease in adolescent-reported internalizing and externalizing problem behaviour. More similarity between mother and adolescent was related to a decrease in internalizing and externalizing problem behaviour as reported by the mother.

Mediating mechanism

The second research question was whether the quality of the parent–adolescent relationship perceived by the adolescent was the mediating mechanism for the relation between similarity in personality and behaviour problems. In these analyses, we used the two factors of the quality of the relationship between parent and adolescent: warmth and control. Since the unique contribution of similarity at Wave 1 to problem behaviour at Wave 2, controlling for problem behaviour at Wave 1, was rather small (see Table 3), we restricted our analyses to concurrent problem behaviour.

To test whether the relation between fit in personality and problem behaviour was mediated by the relationship quality, the procedure of Baron and Kenny (1986) was followed. Their procedure contains four requirements for mediation to be met. The first requirement is that the predictor variable has to be correlated with the dependent variable. As we have seen in Table 2, similarity in personality was related to concurrent problem behaviour, with significant correlations ranging from $r = -0.12$ to -0.31. The second requirement is that the predictor variable has to be correlated with the mediator, i.e. the factors warmth and control. Similarity in personality between mother and the adolescent correlated significantly with control by the mother ($r = 0.15$, $p < 0.05$). Because lower control scores indicated more control this correlation indicates that adolescents who are more similar in personality to their mothers report less control from their mothers. Similarity in personality between father and the adolescent was not significantly correlated to warmth or control by father. The remaining steps in the Baron–Kenny procedure were therefore limited to mother's control. The third requirement is that the mediator variable has to be correlated with the dependent variable. Mother's control factor was significantly related to both adolescent- and mother-reported externalizing problem behaviour at Wave 1 ($r = -0.46$ and $r = -0.18$, respectively) and to adolescent-reported internalizing problem behaviour ($r = -0.22$), but not to mother-reported internalizing problem behaviour. These results indicate that adolescents who report more control from their mother report more problem behaviour. These findings implicate that the third requirement of the Baron–Kenny procedure was partially met. The fourth requirement of the Baron–Kenny procedure is that the correlation between the predictor variable and the dependent variable has to be reduced, after controlling for the mediator variable. This requirement was tested comparing two hierarchical regression models. These analyses were restricted to significant findings of the former steps, that is to adolescent- and mother-reported externalizing problem behaviours and adolescent-reported internalizing problem behaviours and mother's control. As Table 4 shows, in the first regression model, similarity in personality between mother and adolescent was entered as the first step, and mother's control as the second step. In the second model the steps were alternated. There were only marginal reductions of the contribution of the predictor variable after controlling for the zero-order mediating variable. Moreover, the contribution of similarity as the second step to predict problem behaviour remained significant. Thus, to a large extent control and similarity predicted problem behaviour independently yet there was no evidence for

Table 4. Predicting Wave 1 self- or mother-reported externalizing problem behaviour and self-reported internalizing problem behaviour: testing mediator effects of mother's control

Model 1	R^2 change	Model 2	R^2 change
Dependent variable: self-reported externalizing problem behaviour at Wave 1			
Mother–adolescent similarity	0.05**	Mother's control	0.21**
Mother's control	0.19**	Mother–adolescent similarity	0.03**
Dependent variable: mother-reported externalizing problem behaviour at Wave 1			
Mother–adolescent similarity	0.03**	Mother's control	0.03**
Mother's control	0.02**	Mother–adolescent similarity	0.02*
Dependent variable: self-reported internalizing problem behaviour at Wave 1			
Mother–adolescent similarity	0.08**	Mother's control	0.05**
Mother's control	0.03**	Mother–adolescent similarity	0.07**

*$p < 0.05$; **$p < 0.01$.

warmth and control as acting as mediating variables between personality similarity and adolescent problem behaviour.[1]

Moderating effects of personality type

The third research question considered differential effects of similarity for different personality types. To answer this question, we used three personality types (resilients, undercontrollers, and overcontrollers) that we identified in previous research on this sample (van Aken & Dubas, in press). These types were derived using *k*-means cluster analysis on the Big Five scores and were reliably replicated across gender and randomly selected subsamples (see van Aken & Dubas, in press, for specific details on how the types were derived and for additional information on validation of the types).

A MANOVA was executed to detect differences in similarity with the parent between the three types. These analyses were also restricted to concurrent problem behaviour. Post hoc pairwise comparisons of the personality types of the adolescents using Bonferroni showed significant ($p < 0.001$) and consistently higher similarity for resilient adolescents and their parents (mean similarity with father and mother 0.44 and 0.48 respectively) than for under- or overcontrolled adolescents and their parents (mean similarity with father and mother for undercontrolled adolescents 0.25 for both fathers and mothers; for overcontrolled adolescents 0.19 and 0.25 for fathers and mothers, respectively).

Using regression analyses, we then explored the contribution of the interaction of similarity and personality type to concurrent problem behaviour. For the three personality types, dummy variables were created. The three-category classification of personality types can be represented in the regression equation by introducing two dummy regressors (Cohen & Cohen, 1983). Similarity variables were centered (i.e. the mean was subtracted

[1]Since findings from the mediator and moderator analyses are usually hard to replicate and we did have the possibility to replicate the study with the other sibling in the families, we examined whether our replication confirmed the findings of the present study. The mediator results of the replication analyses confirmed the findings reported in our manuscript but were extended to warmth, in accordance with our expectations. The replication showed a partially mediating effect of mother's and father's warmth in the relations between both similarity in personality and self- and mother-reported externalizing problem behaviour and similarity in personality and self-reported internalizing problem behaviour.

from each variable) before each interaction term was formed in order to reduce multicollinearity (Aiken & West, 1991).

For internalizing problem behaviour two significant interaction effects were found for similarity and personality type. Both interactions indicated that parent–offspring similarity for the whole group was not significantly related to internalizing problem behaviour, whereas for the overcontrolling personality type alone similarity was significantly related to internalizing behaviour. In the case of self-reported internalizing problem behaviour, similarity with mother contributed significantly to the prediction of (fewer) internalizing problems for the overcontrolled personality type ($\beta = -0.25$, $p < 0.01$). In the case of father-reported internalizing problem behaviour, similarity with father also contributed significantly to the prediction of (fewer) internalizing problems for the overcontrolled personality type ($\beta = -0.22$, $p < 0.05$). In both cases these results indicated, in line with our hypothesis, that for overcontrolled adolescents compared with non-overcontrolled adolescents more similarity to a parent is associated with less concurrent internalizing problem behaviour. No significant interaction effects were found for concurrent externalizing problem behaviour. In line with our expectations we found no effects for the resilient type and, contrary to our expectations, we found no effects for the undercontrollers.[2]

DISCUSSION

The goals of our study were to investigate whether similarity in personality between adolescents and their parents contributed to the psychosocial adjustment of adolescents; whether the quality of the relationship with their parents was the mediating variable for this association, if found; and whether personality type of the adolescent was a moderating variable. We discuss our results with respect to each of these goals.

Adolescents who were more similar in personality with their parents showed less internalizing and externalizing problem behaviour both concurrently and over time (two years later). More similarity in personality between adolescents and their parents was only associated with less problem behaviour according to the perception of that parent.

We examined whether relationship quality was the mediating mechanism for the relation between similarity in personality and concurrent problem behaviour. To test this assumption, we used two factors of the parent–adolescent relationship: warmth and control. The relation between similarity in personality and problem behaviour was not mediated by either warmth or control.

Finally, we examined whether the link between parentchild similarity and adolescent problem behaviour was moderated depending on the adolescent's personality type

[2]In our replication, we found moderator effects for personality type for internalizing problem behaviour. More similarity with father was significantly related to less self-reported internalizing problem behaviour for all three personality types but this relation was weaker for the resilient type ($\beta = -0.25$, $p < 0.01$) than for the non-resilient type ($\beta = -0.40$, $p < 0.00$). More similarity with mother was significantly related to less self-reported internalizing problem behaviour for all three personality types but this relation was weaker for the resilient type ($\beta = -0.28$, $p < 0.05$) and for the overcontrolled type ($\beta = -0.30$, $p < 0.05$) than for the undercontrolled type ($\beta = -0.46$, $p < 0.00$). No significant interaction effects were found for concurrent externalizing problem behaviour. Although the results in the replication differ from the reported results (except for the lack of interaction effects for externalizing problem behaviour), the replication results are in accordance with our expectations for the resilient and overcontrolled type. The replication results do not match our expectations of more similarity with more externalizing problem behaviour for undercontrollers. In contrast, we found a stronger relation between more similarity and less internalizing problem behaviour for undercontrollers than for the other personality types. Complete results of the replication study can be requested by email from the first author.

(resilient, overcontrolled, or undercontrolled). Some moderating effects were found. Specifically, the link between parent–adolescent personality similarity and problem behaviour is present for overcontrollers but not for the other personality types. The effects that were found for the overcontrolled personality type as compared with non-overcontrolled personality types were in line with our prediction that more similarity in personality between a parent and an overcontrolled adolescent would be associated with less internalizing problem behaviour. The lack of a relation for the resilient type concurred with our prediction, whereas contrary to our expectations, the undercontrolled type did not show a stronger link and instead displayed no relation between similarity and problems. Since not all comparisons resulted in significant moderating effects (i.e. neither for all raters of problem behaviour nor for both types of problem behaviour), the interpretation of the moderating effects must be made with caution.

According to the behavioural genetic perspective, parent–child similarities in personality are partly due to genetic influences. Although twin studies (Henderson, 1982; Plomin, Pedersen, McClearn, Nesselroade, & Bergeman, 1988; Bouchard & Loehlin, 2001; Spinath & O'Connor, 2003) indicate that personality traits show substantial heritability, there is a discrepancy between twin and family design heritability estimates due to non-additive genetic inflences, which results in much lower average parent–offspring correlations for extraversion and neuroticism (Plomin et al., 1988; Rowe, 1994). In an interesting study Spinath and O'Connor (2003) examined the genetic influence on both personality and parenting and concluded that the covariance between personality and parenting dimensions was mediated by environmental influences. The present study explored the relation between parent–offspring similarity in personality and adolescents adjustment. Within this scope we examined parenting as a mediator and the adolescent's personality type as a moderator. However, several alternatives such as the inclusion of parenting as a moderator variable are also possible, although it was beyond the purpose of the present study to examine this possibility.

The concept of goodness of fit refers to a broad range of matches of characteristics, needs, or values of individuals and their environment (Seifer, 2000). Both objective and subjective assessment of individuals or their environments provides unique information. Studies on person–environment fit more often use subjective rather than objective measures of the person–environment fit, such as an individual's perception of the match between an ideal and actual university environment (Roberts & Robins, 2003). In our study we focused on an objective match in self-reported (subjective) personality characteristics of parents and adolescents. We found a meaningful relation between parent–offspring similarity and problem behaviour in general. Replication of our findings in a design in which adolescents (or parents) directly report on the similarity in personality with their parent (or adolescent) would help to clarify whether it is perception of the fit or the actual fit or both that contribute to the link with adolescent problem behaviours. Moreover, objective or third-party observation of the parent–child relation and adolescent problem behaviour may also help to disentangle perceiver effects from other possible dynamic processes.

Our results concerning personality type identified overcontrollers as particularly vulnerable or sensitive to a mismatch on parent–child personality characteristics. Overcontrollers not resembling their parents are at risk for internalizing problems. As our analyses indicated, the quality of the relationship was not the mediating mechanism between similarity and problem behaviour. Therefore, the question still remains of how to explain the relation between parent–offspring similarity and problem behaviour. One

explanation could be the interpretation of overcontrollers' behavioural characteristics as problematic. It may be difficult for non-overcontrolled parents to empathize with and to be tolerant towards inhibited, overcontrolled behaviour of their adolescent. The reactions of these parents may result in adolescents reporting more internalizing problem behaviour, whereas overcontrolled parents may show more understanding of inhibited behaviour of their overcontrolled adolescent and perceive their behaviour as less problematic.

One explanation for not finding effects for the undercontrolled type is that for most of the individuals in this middle-class sample the threshold for the emergence of coercive interaction patterns was not reached. For adolescents who show modest undercontrolled behaviour resemblance to their parent(s) may not lead to more externalizing problem behaviour, whereas for more extreme cases of the undercontrolled personality types parent–offspring similarity could lead to more externalizing problem behaviour. In the future, research using a more diverse sample of adolescents could shed a light on the link between parent–offspring personality similarity and adolescent adjustment for the undercontrolled personality type.

We have already compared the correlation between the parent with whom similarity in personality was assessed and his or her perception of the adolescent's problem behaviour with the same similarity measure and the perception of the adolescent's problem behaviour of the other parent. In contrast to the former, the latter correlations were lower and usually nonsignificant. Apparently, similarity in personality has an impact on the interpretation of adolescent behaviour by the parent: if parent and adolescent resemble each other more, the parent will experience and report the adolescent's behaviour as less problematic. This is consistent with Seifer's (2000) operationalization of the goodness of fit concept as the subjective match between behaviour and expectations in which appraisal of behaviour plays a central role. We only found an effect for the overcontrolled personality type on the relation between parent–offspring similarity and internalizing problem behaviour.

The current investigation focused on parent–offspring similarity separately for mothers and fathers. Future research should focus on the simultaneous resemblance of the adolescent to both parents and, with a large enough sample of families, resemblance to siblings should also be considered. Other research has indicated that the constellation of family relationships influences the effect a specific parent–child relation has on adolescent adjustment (see e.g. O'Connor, Hetherington, & Climgempeel, 1997). In line with the outcomes of this study, the impact of parent–offspring similarity in personality on adolescent adjustment could vary as a function of the degree of similarity in personality among all family members or the degree to which the adolescent resembles both parents.

This study was limited in a number of ways. One limitation was that our analyses were restricted to one assessment of parent–offspring similarity in personality, whereas even during a two-year period changes in the parent-adolescent personality similarity could occur. Nevertheless, this similarity even predicted changes in adolescent functioning two years later. The second limitation was the use of a nonclinical sample, with probably less extremes in personality dimensions, less variation in parenting behaviour, and a more limited extent of problem behaviour. In clinical samples there may be less restriction of range on all of the variables we investigated and, thus, results might even be stronger than those reported here. Despite these limitations the present study highlights the importance of considering parent–offspring personality similarity for understanding individual differences in adolescent adjustment. Additional research is needed to clarify factors that mediate and/or moderate this link.

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