



Universiteit Utrecht

Parenting and Child Personality; Relations with Reactive and Proactive Aggression in Children

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Abstract

The current study extends previous research by focusing on main and interactive effects of parenting and child personality on more specific externalizing problems, namely childhood reactive and proactive aggression. The sample consisted of 137 4th grade children at risk for developing externalizing behavior problems. Parents (mothers $n = 127$, fathers $n = 79$) reported on quality of parent-child relationship, exhibited positive and negative control and childhood aggression. Teachers ($n = 50$) reported on child Big Five personality traits. Multiple regression analyses revealed that a warm, affective relationship with both parents is related to less reactive aggression. In addition, a warm affective relationship with mother and high levels of paternal positive control were associated with less proactive aggression. Furthermore, low levels of child extraversion and high levels of child emotional stability were associated with proactive aggression. No interactive effects of child personality and parenting on child aggression were found. The results suggest that it is necessary to differentiate between subtypes of aggression and paternal and maternal parenting when targeting childhood aggression.

Keywords: parenting, child personality, big five, reactive and proactive aggression

Externalizing problem behavior is the most common and persistent form of maladjustment in childhood (Dishion & Patterson, 2006). With respect to predisposing and maintaining risk factors, some critics claim that peers and heredity are most influential on children's development (Harris, 1998), whereas other studies demonstrate that parents do have an important influence on child adjustment (e.g., Collins, Maccoby, Steinberger, Hetherington, & Bornstein, 2000; Galambos, Barker, & Almeida, 2003). In a transactional model, both child characteristics and contextual factors influence child (mal)adjustment (Sameroff, 1995). Two frequently proposed risk factors for the development of externalizing problems are specific child personality factors and parenting practices (e.g., Galambos et al., 2003; Rothbart & Bates, 1998). Beside direct effects, these risk factors have interacting effects on the development of externalizing problem behavior (e.g., De Clercq, Van Leeuwen, De Fruyt, Van Hiel, & Mervielde, 2008; O'Connor & Dvorak, 2001; Prinzie et al., 2003).

The present study extends prior research by investigating whether the main and interactive effects of child personality and parenting practices can be found for more specific externalizing problems, namely reactive and proactive aggression (Dodge & Coie, 1987). In addition, by including both negative and positive parenting practices (cf. De Haan, Prinzie, & Deković, 2010; Prinzie et al., 2003), this study provides a more comprehensive view of the influence of parenting on childhood aggression.

Parenting practices

Considerable consistency exists in the characterization of parenting (O'Connor, 2002). On the behavioral level, two dimensions of the parent-child relationship are most consistently assessed and associated with children's and adolescents developmental outcomes. These dimensions are *support* (i.e., warmth, acceptance, attachment) and *control* (i.e., monitoring, discipline, supervision) (Baumrind, 1991a; Gray & Steinberg, 1999; Maccoby & Martin, 1983; O'Connor, 2002). O'Connor (2002) stated that it is unclear whether support and control are best considered when combined into parenting styles (e.g., authoritative parenting, authoritarian parenting; Baumrind, 1991a; Maccoby & Martin, 1983), or as independent continuous dimensions (Barber, 1996). Although some studies found evidence for interactive relations between the parenting dimensions support and control (e.g., Forehand & Noussianen, 1993), many studies failed to find interactive relations (e.g., Barber, Olsen, & Shagle, 1994; Caron, Weiss, Harris, & Catron, 2006; Galambos et al., 2003; Jones et al., 2008). As a result, it is important to assess dimensions of parenting separately to prevent for losing information by creating subtypes of parenting (Davidow & Grusec, 2006).

Relation between parenting practices and externalizing problem behavior

A large body of studies focus on the relation between parenting and child problem behaviors. Relations between parenting and problem behavior appeared to be stronger for externalizing behavior than for internalizing behavior (e.g., Galambos et al., 2003; Jones et al., 2008). A number of studies found a relation between low levels of parental support and externalizing problem behaviors in children (e.g., Jones et al., 2008; Lee & Gotlieb, 1991; McKee, Forehand et al., 2008; Reitz, Deković, & Meijer, 2006). A proposed explanation for this negative relation with externalizing behavior is that parenting characterized by a lack of support, involvement and warmth, interferes with children's capacity to regulate arousal (Tronick, 1989). As a consequence of this lack of self-regulation, children may have difficulty with considering the consequences of performed actions and with refraining from aggressive behavior (Brody, Dorsey, Forehand, & Armistead, 2002).

In addition, the dimension parental control can be separated into two sub dimensions, namely behavioral control and psychological control (e.g., Barber, 1996; Galambos et al., 2003). Behavioral control is concerned with the regulation, monitoring and management of behavior of the child and lack of behavioral control is related to externalizing behavior in many studies (e.g., Barber et al., 1994; Caron et al., 2006; Galambos et al., 2003; Gray & Steinberg, 1999; Pettit, Laird, Dodge, Bates, & Criss, 2001). A credible explanation for this relation is that parents who exert lax control and inconsistent monitoring deprive children of valuable learning experiences, necessary for the development of behavioral- and emotional control. On the contrary, parents who exert firm and consistent discipline foster self regulation and conformity in their children resulting in less behavior problems (Hart, Newell, & Olsen, 2003). In comparison, psychological control, which is parental behavior that intrudes on the development of autonomy of a child through psychological means (Barber et al, 1994), is associated with more internalizing behavior (e.g., Barber et al., 1994; Baumrind 1991a) and more important for adolescents (e.g., Barber et al., 1994).

Despite the evidence that both support and behavioral control are related to externalizing problems in children, findings regarding the relative importance of each dimension are mixed. For example, Jones et al. (2008) and McKee, Forehand et al. (2008) found that only the dimension warmth (i.e. support) uniquely and differentially predicted externalizing problem behavior, with low levels of warmth leading to externalizing behavior. In contrast, Caron et al. (2006) found that only behavioral control uniquely and differentially predicted externalizing problem behavior, with low levels of behavioral control leading to externalizing behavior.

Relation between child personality and externalizing problem behavior

Beside the above elaborated direct effect of parenting practices on childhood externalizing problem behavior, the relation between childhood temperament and externalizing problem behavior has also been extensively documented (e.g., Nigg, 2006; Rothbart & Bates, 1998). An alternative concept to use for temperament is “personality”. Despite the fact that most researchers and practitioners are reluctant to see young children as having personalities, Shiner and Caspi (2003) stated that it becomes more difficult to distinguish between temperament and personality when children move out of infancy. In addition, Caspi, Roberts, and Shiner (2005) concluded that personality and temperament increasingly appear to be more alike than different. The Five Factor Model (FFM), also known as the Big Five, is the best established and most frequently used model measuring personality in adults and is also obtained in factor analyses of parent and teacher reports on children (summarized in Shiner & Caspi, 2003). Generally, these five factors are labeled as (1) extraversion (2) agreeableness, (3) conscientiousness, (4) emotional stability, and (5) openness to experience (Caspi et al., 2005; Shiner & Caspi, 2003). One frequently used personality inventory with children today assessing those five traits, is the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999). Two studies using this inventory found considerable evidence for the stability of child personality over time (De Fruyt et al. 2006; Prinzie & Deković, 2008).

Many studies found evidence for relations between Big Five personality traits and childhood externalizing problem behavior, providing evidence for the discriminative power of the FFM with children. Low benevolence, low conscientiousness (De Haan et al., 2010; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Prinzie et al., 2003; Van den Akker, Deković, & Prinzie, 2010; Van Leeuwen, Mervielde, Braet, & Bosmans, 2004), high extraversion (De Haan et al., 2010; John et al., 1994; Prinzie et al., 2003; Prinzie et al., 2004) and low emotional stability (De Haan et al., 2010; Van den Akker et al., 2010) have all been related to more externalizing problem behavior.

Interactive effects of child personality and parenting practices on externalizing behavior

In addition to above summarized direct effects of child personality and parenting on externalizing problem behavior, it is important to acknowledge that children’s susceptibility to parenting may differ, as a function of their personality (Belsky, 1997). Oxford, Cavell, and Hughes (2003) and Wootton, Frick, Shelton, and Silverthorn (1997) found for example that children scoring high on callous-unemotional personality traits (i.e. children who are

manipulative, emotionally constricted, and low on empathy and guilt) displayed elevated levels of behavior problems, regardless of the parenting they received. Following their lead, O'Connor and Dvorak (2001) also found that 4% of children in their community sample had personality characteristics, which could not be influenced by adequate forms of parenting. However, it occurred more often (19% of the sample) that child personality characteristics, which were measured as a blend of the domains of the FFM, served as a buffer against inadequate parenting.

In contrast to O'Connor and Dvorak (2001), several studies focused on independent scores on the five personality domains using the HiPIC (Mervielde & De Fruyt, 1999). In a cross-sectional study with parents, Prinzie et al. (2003) found that children with low levels of benevolence who were exposed to parental overreactive parenting and children with low levels of conscientiousness who were exposed to paternal coercive parenting, showed elevated levels of externalizing problem behavior. These results were extended by van Leeuwen et al. (2004) by finding that low levels of benevolence and conscientiousness and high levels of negative parental control at time one predicted externalizing behavior three years later. Similarly, Van Leeuwen, Mervielde, DeClercq, and De Fruyt (2007) found comparable interactions in their longitudinal study for both a referred and a non-referred sample. Dissimilar from above mentioned studies, De Haan et al. (2009) differentiated in their longitudinal study between aggression and delinquency. Likewise, they found that overreactive parenting was more important for less conscientious and benevolent children when examining both delinquency and aggression. However, when only aggression was taken into account it appeared that children who were more imaginative and less extraverted were also more susceptible to overreactive parenting. The above summarized results can also be explained from a positive perspective, namely that children with high levels of especially conscientiousness and benevolence are not likely to develop externalizing behaviors, regardless of the level of inadequate parenting they receive. This is in line with the earlier mentioned susceptibility hypothesis (Belsky, 1997).

Current study

The main objective of the present study is to examine whether reported direct and interactive effects of child personality and parenting on general externalizing problems can be found for more specific externalizing problems, namely reactive and proactive aggression. Reactive aggression can be defined as a defensive reaction or outburst towards a perceived threat, whereas proactive aggression is goal-oriented, such as coercion and bullying (Dodge &

Coie, 1987). Furthermore, instead of focusing only on negative parenting practices (e.g., De Haan et al., 2010; Prinzie et al., 2003), positive parenting variables are also taken into account, which can buffer the child against externalizing problems (Prinzie et al., 2003).

Based on previous research, several hypotheses are formed regarding main and interactive effects. First, it is expected that parenting has a direct relation with childhood aggression. However, because of mixed findings regarding the relative importance of specific parenting dimensions, no detailed hypotheses are stated. With respect to personality, it is expected that children with low scores on benevolence, conscientiousness and emotional stability and high scores on extraversion, show more childhood aggression. In addition, regarding the interactive effects, it is expected that children with low scores on benevolence, conscientiousness and extraversion, and high scores on imagination, who are exposed to negative parenting practices, show more childhood aggression. Besides, explorative analyses will be performed on possible interactions between child personality factors and positive parenting practices on childhood aggression. Finally, it is expected that results will differ for reactive and proactive aggression. For example, Vitaro, Brendgen, and Tremblay (2002) found divergent profiles for reactive and proactive aggressive children on several dimensions of personal functioning. However, because of no known studies examining the direct and interactive effects of parenting and child personality on reactive and proactive aggression, no detailed hypotheses are formed.

Method

Procedure

The current study used cross-sectional data of a sample from a larger study, examining the effect of a preventive intervention for children at risk for developing externalizing problems, which was approved by the Dutch Central Committee on Research Involving Human Subjects (Van Londen et al., 2007). The sample was drawn from 48 elementary schools in low to middle SES neighborhoods of two regions in the Netherlands. First, parents of all children in fourth grade received a general information letter about the study. This letter included a consent form to give permission to teachers to fill in a questionnaire about their child. This questionnaire included all items from the Teacher Report Form (TRF; Achenbach, 1991). Subsequently, children with an elevated score on the externalizing subscale of the TRF (M T-score = 67.36, SD = 6.21) were selected to participate in the study, creating an at-risk sample for externalizing problem behavior. In this way, children with a range of severity in externalizing problems participated in the study, while sampling bias inherent with a referred

sample was avoided (Angold & Rutter, 1992). In comparison, a community sample has less children experiencing significant levels of externalizing problem behavior, which makes it hard to find relationships (Caron et al., 2006).

Of the selected children, 70% of the families gave permission to participate in the study. When parents agreed to participate, an appointment at child's school was made to give more information on the study and to hand the first questionnaire to parents. The current study used data of parents from this first measurement moment. Furthermore, data of teachers from the second measurement moment, ten weeks later, was used to assess personality characteristics in children.

Participants

After deleting cases for which no parent or teacher data was available ($n = 44$), the sample consisted of 137 4th grade children at risk for developing externalizing behavior problems (72% boys, $M_{\text{age}} = 10.0$ years, $SD = 0.5$), their teachers ($n = 50$, $M_{\text{age}} = 39.9$ years, $SD = 11.6$) and parents. In total, 127 mothers ($M_{\text{age}} = 40.1$ years, $SD = 4.8$) and 79 fathers ($M_{\text{age}} = 43.0$ years, $SD = 5.4$) participated in the study. Following guidelines for sample size of multiple regression analyses proposed by Green (1991), our mother sample exceeds the minimum sample size of $104 + k$, where k is the number of predictors. For 69 children both parents filled in a questionnaire, for 58 children only mothers, and for 10 children only fathers. However, most children (80%) came from two-parent households. With respect to ethnic background, 34% of children came from immigrant groups. Most of these immigrant children were Moroccan (15 % of total sample) or Turkish (5% of total sample). With respect to parental education, 11.5% of mothers and 30.7% of fathers went to University or higher vocational education, 38.5% of mothers and 33.3% of fathers, completed intermediate vocational education, 36.1% of mothers and 21.8% fathers went to high school or lower vocational education and 10.7% of mothers and 14.1% of fathers completed primary education or less.

One reason for using multiple informants (mothers, fathers and teachers) was to avoid rater bias which increases the credibility and reliability of results (O'Connor, 2002). Furthermore, parents were chosen to respond on parenting variables, because their judgment might be a better measure of actual parenting practices than child reports (Pettit et al., 2001). In addition, teacher reports were used for child personality, because teachers know more about children's behavior with peers and can compare children with "average" child behavior (Shiner & Caspi, 2003). Furthermore, a study by Prinzie and Deković (2008) indicated that

the HiPIC is a valid measure to be used with teachers. Finally, parent reports on reactive and proactive aggression were used, because a study by Youngstrom, Loeber, and Stouthamer-Loeber (2000) revealed that parents report significantly more problem behavior than teachers. A possible explanation for this finding is the difference between a structured classroom environment, where aggression is not accepted, and a less structured home environment.

Instruments

Reactive and Proactive aggression

To assess reactive and proactive aggression parents filled in the six-item Reactive and Proactive Aggression Questionnaire (REPRO) developed by Dodge and Coie (1987) and translated to Dutch by Hendrickx, Crombez, Roeyers, and Orobio de Castro (2003). Three items measure *reactive aggression* (e.g., “When my child has been teased or threatened, he or she gets angry easily and strikes back”) and three items measure *proactive aggression* (e.g., “My child uses physical force in order to dominate other kids”). The answer categories range from 1 (*never*) to 5 (*always*). Several studies found that the validity, factor structure and reliability of this instrument are adequate (e.g., Hendrickx et al., 2003; Hubbard et al., 2002). For this sample, Cronbach’s alphas for mothers were .76 for reactive aggression and .79 for proactive aggression. For fathers Cronbach’s alphas were .80 for reactive aggression and .83 for proactive aggression. For further analyses, mean scores were computed for both reactive and proactive aggression. In addition, because of high intercorrelations, parents scores on reactive and proactive aggression were combined when both father and mother scores were available ($r = .65, p < 0.01$ for reactive aggression; $r = .69, p < 0.01$ for proactive aggression). Advantages of these aggregated scores are the reduced measurement error and the smaller number of potential analyses.

Parenting

Both fathers and mothers reported on parenting with seven parenting measures. First, *attachment* was assessed with the attachment subscale of the Dutch version of the Parenting Stress Index - Short Form (PSI-SF; Abidin, 1990; De Brock, Vermulst, Gerris, & Abidin, 1992) This scale consists of five items (e.g., “My child and I have a bad relationship” - reverse coded) with answer categories ranging from 1 (*I totally disagree*) to 4 (*I totally agree*). Cronbach’s alpha for mothers was .61. For fathers, one item was deleted (“Sometimes my child does annoying things, only to tease me”) to get a Cronbach’s alpha of .59. Second, *acceptance* was assessed with another subscale of the Dutch version of the PSI-

SF (Abidin, 1990; De Brock et al., 1992). This subscale consists of seven items (e.g., “My child can be difficult; it is not easy to have a child like mine”- reverse coded, mothers $\alpha = .71$, fathers $\alpha = .70$) and has the same answer categories. Third, *parental involvement* was measured with a subscale of the Alabama Parenting Questionnaire (APQ; Elgar, Waschbusch, Dadds, & Sigvaldason, 2007; Frick, 1991). This subscale consists of ten items (e.g., “I have a friendly talk with my child”), which were translated to Dutch for the purpose of this study (mothers $\alpha = .73$, fathers $\alpha = .76$). Parents were asked to rate on a 5-point Likert scale (1 = *never* to 5 = *always*) to what extent they agreed with the presented statements. The fourth and fifth parenting measures, *positive parenting techniques* (six items, e.g., “I praise my child if he/she behaves well”) and *inconsistent discipline* (six items, e.g., “The punishment I give my child depends on my mood”), were assessed with other subscales of the APQ (Elgar et al., 2007; Frick, 1991) and have the same answer categories. Cronbach’s alpha of positive parenting techniques was .79 for mothers and .83 for fathers. One item of inconsistent discipline was deleted (“you punish your child when it did something wrong”) to increase Cronbach’s alpha to .61 for both mothers and fathers. The sixth measure, the subscale overreactivity of the Parenting Scale (PS, Arnold, O’Leary, Wolff, & Acker, 1993; Prinzie, Onghena, & Hellinckx, 2007), assessed *overreactive parenting*. This subscale consists of seven items, and measures the tendency of parents to use overreactive discipline strategies using a 7-point likert scale. (e.g., “When my child misbehaves: I raise my voice or yell”, mothers $\alpha = .80$, fathers $\alpha = .79$). Finally, *monitoring* was measured with four items indicating parental knowledge about child’s friends, whereabouts after school, leisure time and school grades. Answer categories ranged from 1 (*nothing*) to 4 (*everything*) on how much parents knew. Cronbach’s alpha for mothers was .63 and for fathers .69.

A confirmed factor analysis with orthogonal varimax rotation was conducted with these seven parenting measures, which resulted in three higher order factors: “Affective relationship” (containing the scales attachment and acceptance), “Positive control” (containing the scales monitoring, positive parenting techniques and parental involvement) and “Negative control” (containing the scales overreactive parenting and inconsistent discipline). In total, these factors explained 71% of variance for mothers and 72% for fathers. Cronbach’s alpha of Affective relationship was .78 for mothers and .79 for fathers, of Positive control .85 for mothers and .88 for fathers and of Negative control .79 for mothers and .76 for fathers. As a result of these analyses, composites of the means of the standardized scale scores were computed for fathers and mothers separately. After screening the data, it appeared that data on Affective relationship was missing for three mothers and two fathers.

These values were missing completely at random: Little's MCAR test: $Q^2(2, n = 137) = .73, p = .69$. To prevent deletion of the whole case from the analyses, these five missing values were imputed with the Expected-Maximization (EM) algorithm (Schafer & Graham, 2002). In this way, data on parenting was complete for the 127 mothers and 79 fathers participating in the study. For further analyses, parenting dimensions were examined for fathers and mothers separately, because intercorrelations were not sufficient to aggregate scores ($r < .50$). Furthermore, unique information was retained, because research revealed that parents within the same family can exhibit very different parenting practices (e.g., Lewis & Lamb, 2003).

Personality

To measure personality, teachers were asked to fill in the HiPIC. This is a Dutch instrument designed to describe individual differences between children aged 6 to 12 years (Mervielde & De Fruyt, 1999). The HiPIC contains 144 items and assesses 18 facets (8 items per facet), which are hierarchically structured under five higher order domains. These five domains are Extraversion (divided into the facets shyness, optimism, expressiveness and energy), Benevolence (also known as agreeableness; divided into egocentrism, irritability, compliance, dominance and altruism), Conscientiousness (split into achievement motivation, concentration, perseverance and orderliness), Emotional Stability (divided into anxiety and self-confidence) and Imagination (also known as openness to experience; split into creativity, curiosity and intellect). Items are short statements about observable behavior (e.g., "accepts authority"). Teachers had to rate these statements on a 5-point Likert scale (1 = *almost not characteristic* to 5 = *very characteristic*). Cronbach's alpha for the domains were .92 for Extraversion, .93 for Benevolence, .92 for Conscientiousness, .86 for Emotional stability and .92 for Imagination. In addition, Mervielde and De Fruyt (2002), as cited in Prinzie & Deković (2008), reported positive findings on convergent, discriminant and construct validities, temporal stability and structural replicability. Furthermore, Shiner and Caspi (2003) identified the HiPIC as one of the approved instruments to assess personality in children. For further analyses, the mean score for each personality domain was computed.

Plan of analysis

Multiple regression analyses were performed to examine main and interactive effects of parenting and child personality on the level of reactive and proactive aggression in children. These effects were examined for fathers and mothers separately, resulting in four regression models: a father and a mother model for reactive aggression and a father and a mother model

for proactive aggression. In these regression models, all personality variables were “centered” (i.e. put in deviation score form so that their means were zero) for the father and mother sample separately. Subsequently, they were multiplied with the already standardized parenting variables to form the interaction variables. Advantages of this procedure are that problems with multicollinearity are reduced and that interpretations of significant interaction effects are straightforward (Aiken & West, 1991).

To predict levels of reactive and proactive aggression, predictor variables were entered in the equations in three steps. The three parenting dimensions were entered in the first step, because of their clear relation with externalizing behavior (e.g., McKee, Colletti et al., 2008). Subsequently, the five personality dimensions were entered in the second step, because of their direct and interactive effects on externalizing behavior (e.g., Prinzie et al., 2003). Finally, the computed interaction terms were entered in the third step. Regression analyses were conducted again after these initial analyses, including only steps that significantly increased the R^2 . A moderator effect between personality and parenting was found when the R^2 increased significantly after entering the interaction terms in the third step.

Results

Preliminary analyses

Before running the analyses, several assumptions of multiple regression analyses were tested. First, normality in distribution of variables was explored. With respect to the kurtosis of distributions, values ranged from 0.07 to 2.02. In addition, values for skewness ranged from 0.01 to 1.39. These values did not indicate major deviations from normality (Muthén & Kaplan, 1985). Furthermore, independency of predictors was assessed with use of intercorrelations, see Table 1. Comparable to other studies (e.g., Prinzie et al., 2003), significant small to moderate correlations (Cohen, 1988) existed among the variables within the parenting and personality domain. However, these correlations were not substantial enough ($r > .90$; Field, 2005) to make variables redundant (Prinzie et al., 2003).

Table 1

Intercorrelations, mean scores, and standard deviations of assessed predictor and outcome variables

	1	2	3	4	5	6	7	8	9	10	<i>M</i>	<i>SD</i>
1. Affective relationship	=	.29**	-.31**	.05	.08	.05	.07	.01	-.32**	-.19*	-0.01 ¹	0.88
2. Positive control	.32**	=	-.17	.01	.02	.06	-.06	.12	-.20*	-.32**	-0.03 ¹	0.82
3. Negative control	-.23**	.08	=	-.10	-.03	-.27**	-.11	-.24*	.00	.11	-0.01 ¹	0.82
4. Extraversion	.14	.10	.08	=	.02	-.01	.43**	.47**	.02	.12	0.00 ²	0.48
5. Benevolence	.02	.15	.01	.09	=	.42**	-.05	.07	-.21*	-.04	0.00 ²	0.48
6. Conscientiousness	.13	.21	-.19*	-.05	.44**	=	-.19*	.49*	-.04	-.10	0.00 ²	0.53
7. Emotional stability	-.06	-.05	-.01	.26**	-.03	-.04	=	.12	-.02	.30**	0.00 ²	0.68
8. Imagination	.12	.21**	-.20**	.30**	.20**	.62**	.05	=	.04	.03	0.00 ²	0.65
9. Reactive aggression	-.30**	-.07	.14	-.05	-.21**	-.09	.03	-.08	=	.56**	2.87	0.87
10. Proactive aggression	-.26**	-.06	.05	-.16*	-.08	-.15*	.27**	-.17	.58**	=	1.54	0.63
<i>M</i>	-0.02 ¹	0.01 ¹	0.01 ¹	0.00 ²	0.00 ²	0.00 ²	0.00 ²	0.00 ²	2.98	1.56	=	=
<i>SD</i>	0.90	0.79	0.86	0.53	0.52	0.58	0.66	0.66	0.91	0.69	=	=

Note. Correlations for mother data ($n = 127$) are below the diagonal; correlations for father data ($n = 79$) are above.

¹ Standardized variables. ² Centred variables.

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

Main and interactive effects

After omitting the steps that did not increase the R^2 , regression diagnostics were conducted together with the final multiple regression analyses to test several assumptions. First, the presence of influential cases was assessed using the standardized residuals. For the mother model on reactive aggression and both father models, it appeared that less than 5% of all cases had a standardized residual greater than ± 2 . Furthermore, less than 1% had a standardized residual greater than ± 2.5 . These percentages indicated that the level of error in the models was acceptable (Field, 2005). However, for the mother model on proactive aggression, three cases (2.4%) had a standardized residual $> \pm 2.5$, and were dropped from the analyses. Second, multicollinearity among predictors was no problem in both mother and father data, because all tolerance statistics were above .2 and all Variance Inflation Factor (VIF) values were well below 10 (Field, 2005). Finally, a linear relation between predictor and aggression variables was assumed.

Final models for predicting levels of reactive aggression are presented in table 2. In both models, no main effects of personality variables or interactive effects of parenting and personality variables on reactive aggression were found. In mother data, 9% of variance in reactive aggression was explained by the reduced regression model, which included only parenting ($F_{3,123} = 4.19, p = .01$). The only significant predictor in the model was the variable affective relationship, which was related to low levels of reactive aggression. The negative regression coefficient of the personality variable benevolence became significant when added into model 2 ($b = -0.42, p = .02$). However, compared to model 1, the R^2 of model 2 did not increase significantly as a result of including this variable. A similar pattern was found in father data. Overall, 13% of variance was accounted for by the regression model consisting of the parenting variables ($F_{3,75} = 3.70, p = .02$). However, only the predictor affective relationship was significant, with low levels of this variable associated with reactive aggression.

Table 2

Regression models predicting mother's and father's reports of child reactive aggression

	Mothers ($n = 127$)			Fathers ($n = 79$)		
	b	SE	β	b	SE	β
Model 1						
Constant	2.98	0.08		2.87	0.09	
Affective relationship	-0.29**	0.13	-.29**	-0.32**	0.12	-.32**
Positive Control	0.03	0.14	.03	-0.14	0.12	-.13
Negative Control	0.08	0.12	.08	-0.13	0.12	-.12

Note. Mother model: $R^2 = .09$, $p = 0.01$. Father model: $R^2 = .13$, $p = 0.02$.

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

Final models for predicting the level of proactive aggression are presented in table 3. In both models, no interactive effects of parenting and personality variables on proactive aggression were found. However, in mother data, both parenting and personality variables accounted for 21% of variance in proactive aggression ($F_{8,115} = 4.47$, $p = .01$). First, similar to both models for reactive aggression, low levels of affective relationship were related to proactive aggression. In addition and beyond this effect, low levels of extraversion and high levels of emotional stability in children were associated with proactive aggression. In father data, parenting variables accounted for 12% of variance in the regression model ($F_{3,75} = 3.15$, $p = .03$), with no main effect of personality. In contrast to the mother model, not affective relationship, but low levels of positive control exhibited by father were significantly related to proactive aggression. In addition, the positive regression coefficient of emotional stability became significant in model 2 ($b = 0.27$, $p = .02$), which is congruent with mother data. However, the R^2 of model 2 did not significantly increase as a result of including this variable.

Table 3

Regression models predicting mother's and father's reports of child proactive aggression

	Mothers (<i>n</i> = 124)			Fathers (<i>n</i> = 79)		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
Model 1						
Constant	1.51	0.06		1.53	0.07	
Affective relationship	-0.22**	0.07	-.31**	-0.07	0.09	-.10
Positive Control	-0.02	0.07	-.02	-0.22**	0.09	-.28**
Negative Control	-0.01	0.07	-.02	0.02	0.09	.03
Model 2						
Constant	1.51	0.05				
Affective relationship	-0.19**	0.06	-.27**			
Positive Control	0.02	0.07	.03			
Negative Control	0.00	0.07	-.00			
Extraversion	-0.28*	0.12	-.23*			
Benevolence	-0.08	0.11	-.07			
Conscientiousness	-0.09	0.13	-.09			
Emotional Stability	0.30**	0.09	.31**			
Imagination	0.01	0.11	.01			

Note. Mother model: $R^2 = .10$ for Model 1; $\Delta R^2 = .11$ for Model 2, $p = 0.01$.

Father model: $R^2 = .11$, $p = 0.03$.

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

Discussion

Over the past few years, several studies have reported on both main and interactive effects of parenting and child personality on externalizing problem behavior in children. To our knowledge, this is the first study that distinguished between reactive and proactive aggression when examining these effects. Furthermore, instead of focusing on negative parenting aspects (e.g., De Haan et al., 2010; Prinzie et al., 2004), this study added positive parenting aspects to provide a more comprehensive view of possible main and interactive effects of parenting. Finally, instead of a white middle class sample (e.g., Prinzie et al., 2003; Van Leeuwen et al., 2004) an ethnic diverse sample with children at risk for developing externalizing behavior was used. At first, it was examined whether parenting and child personality have a direct relation with levels of reactive and proactive aggression in children. In addition, it was examined whether the moderating effect of child personality on the relation

between parenting and general externalizing problems found in other studies (e.g., Prinzie et al., 2003; Van Leeuwen et al., 2004), was the same for reactive and proactive aggression. First, results from the analyses are discussed. Second, limitations of the study are given, together with some recommendations for future research. Finally, a general conclusion is stated, together with several practical implications.

Main effects of parenting and child personality

First, models were constructed for reactive aggression. From the analyses it appeared that only the parenting dimension affective relationship was negatively related to reactive aggression in both the father and mother model. These results are in line with studies of for example Jones et al. (2008) and McKee, Forehand et al. (2008), who found that only the dimension warmth uniquely and differentially predicted externalizing problem behavior. A proposed explanation for this negative relation with externalizing behavior is that a lack of parental support (i.e. warmth, involvement) interferes with a child's capacity to regulate arousal (Tronick, 1989). As a result, children may have difficulty with considering consequences of actions and with refraining from aggressive behavior (Brody et al., 2002).

In addition, the five personality dimensions showed no additive effects in predicting reactive aggression. This result was unexpected, because many other studies did find a main effect of certain personality dimensions when predicting general externalizing behavior (e.g., Van den Akker et al., 2010; Van Leeuwen et al., 2004). Nonetheless, the dimension benevolence in the mother model did have a significant negative relation with reactive aggression when added to the parenting variables together with the other personality dimensions, which is in line with other studies (e.g., De Haan et al., 2010; Prinzie et al., 2003; Van den Akker et al., 2010; Van Leeuwen et al., 2004). However, the model did not significantly improve as a result of this addition. A possible explanation for not finding an additive effect of child personality is that reactive aggression is determined by other child characteristics than child personality. For example, Orobio de Castro, Merk, Koops, Veerman, and Bosch (2005) found that reactively aggressive children attributed more frequently hostile intent to others' actions, compared to proactively and non aggressive children. It is possible that this hostile attribution bias is such an important predictor of performing reactive aggression, that personality characteristics become redundant. Further evidence for the significance of social cognitions in childhood aggression is given by Simmons, Paternite, and Shore (2001). They found that social cognitions work as a mediator between young

adolescents' perceived quality of attachment, which is an important element of the dimension affective relationship, and the level of reported aggression.

With respect to the constructed models for proactive aggression, the mother model revealed the same pattern for parenting compared to the model for reactive aggression, with low levels of the dimension affective relationship predicting proactive aggression. Contrary to the model for reactive aggression, two personality dimensions did have an additional effect on proactive aggression, namely extraversion and emotional stability. However, instead of high levels of extraversion (De Haan et al., 2010; John et al., 1994; Prinzie et al., 2003) and low levels of emotional stability (De Haan et al., 2010; Van den Akker et al., 2010) leading to externalizing problem behavior, these data showed that low levels of extraversion and high levels of emotional stability are related to proactive aggression.

There are several explanations for these contrasting findings. With respect to extraversion, it can be concluded that items on subscales of this dimension are not characteristic of children performing proactive aggression. For example items from "optimism" (e.g., gets sympathy from classmates; gives people a pleasant feeling) and "expressiveness" (e.g., shows thoughts and feelings) do not fit with proactive aggressive behaviors, such as coercion and bullying (Dodge & Coie, 1987). Furthermore, some items of the reversely coded scale "shyness" (e.g., has difficulty making contact; doesn't know how to act appropriately in social situations) are possibly interpreted by teachers as typical "bully" items. For example, it is plausible that teachers view bullies as not knowing how to act appropriately in social situations. In addition, Vitaro et al. (2002) found divergent profiles on several dimensions of personal functioning, with reactive aggressive children being more impulsive, inattentive, excitable and active compared to proactive aggressive children. These concepts are related to extraversion. When considered this way, a negative relation between extraversion and proactive aggression is not strange at all. Furthermore, De Clercq et al. (2008) also found a positive relation between introversion and externalizing behavior.

With regard to emotional stability, the reversely coded subscale "anxiety" and the subscale "self-confidence" provide an explanation for the positive relation with proactive aggression. For example, a study by Dodge & Coie (1987) revealed that children performing proactive aggression are often "leaders", which infers self-confidence in children. Likewise, Baumeister, Smart, and Boden (1996) demonstrated that children with an extreme positive self-concept perform high levels of aggression to protect their superior self-concept when this is doubted by others. In addition, Vitaro et al. (2002) found that proactively aggressive children demonstrated a lack of anxiety compared to reactively and non aggressive children.

As a result of these findings, the positive relation between emotional stability and proactive aggression can be anticipated. To our knowledge, this study is the first discovering such a relationship between the Big Five dimension emotional stability and proactive aggression. In sum, these results for extraversion and emotional stability leads us to the conclusion that relations with Big Five personality dimensions are probably different for reactive and proactive aggression and general externalizing problems.

In contrast to the two models for reactive aggression and the mother model for proactive aggression, the father model for proactive aggression revealed a different pattern with regard to parenting. Not low levels of affective relationship but low levels of positive control led to proactive aggression. This means that the amount of positive control exhibited by fathers is more important for refraining from proactive aggression than the level of affective relationship. Likewise, a study by Prinzie, van der Sluis, de Haan, and Deković (in press) demonstrated that paternal and not maternal authoritative parenting led to lower levels of externalizing behavior three years later. Despite the fact that authoritative parenting is not exactly the same construct as positive control, authoritative parenting does refer to a positive way of exerting control over children's behavior. Furthermore, this finding regarding the relative contribution of maternal versus paternal parenting is consistent with "role theory", which states that the father role is traditionally defined as that of a provider and disciplinarian, while mothers provide warmth and care (Hosley & Montemayor, 1997).

Interactive effects between parenting and child personality

In addition to above elaborated main effects, interactive effects between parenting and child personality were examined to identify children with highest risk of developing reactive and proactive aggression, in presence of certain dysfunctional parenting practices. It appeared that no moderating effect of child personality on the relation between parenting and reactive aggression was found in both mother and father models. A possible explanation for not finding such an effect is that this study used reactive and proactive aggression as outcome variables instead of general externalizing problem behavior. As mentioned above, child social cognitions may be more important when considering reactive aggression, compared to child personality. With respect to proactive aggression, it is possible that presence of particular personality characteristics do not make children more susceptible to certain parenting practices when considering proactive aggression. Nevertheless, it is possible that no results are found because of small sample size and other limitations of this study, on which will now be elaborated.

Limitations and future research

The present study has considerable limitations which influences the interpretation of results. First, direction of theorized effects cannot be confirmed as a result of the cross-sectional nature of the data. This means that child aggression can lead to certain parenting behaviors, instead of the other way around (Rothbaum & Weisz, 1994). However, a longitudinal study by Prinzie et al. (in press) revealed that paternal authoritative parenting at time one, which is related to positive control, predicted change in externalizing behavior at time two. As a result, it is likely that positive control exhibited by fathers predicted proactive aggression. In addition, McKee, Forehand et al. (2008) found that warmth at time one, which is related to affective relationship, predicted change in externalizing behavior at time two. For this reason it is plausible that affective relationship predicted reactive aggression in both the mother and father model and proactive aggression in the mother model. Nevertheless, it is most likely that there exist reciprocal relations between family functioning and emotional and behavioral problems, such as aggression (McKee, Colletti et al., 2008; Reitz et al., 2006). Future longitudinal research should clarify those relations for the results found in this study.

A second limitation of the current study is that only linear (interactive) effects of parenting and child personality on aggression are examined. However, other studies (e.g., Prinzie et al., 2003) found curvilinear effects of overreactive parenting and child benevolence on externalizing problems. This could be an explanation for not finding significant effects of parental negative control, which includes overreactivity, and child benevolence. As a result, future studies should examine curvilinear relationships as well.

A third limitation is related to a discussion about approaching the FFM dimensions independently or as blends of levels of the five dimensions. On the one hand, O'Connor and Dvorak (2001) state that focusing on dimensional scores of child personality provides a limited view, because strongest and most important moderators of parental behavior may be particular blends of dimensional scores. For example, it was shown that children scoring high on callous-unemotional personality traits (i.e. children who are manipulative, emotionally constricted, and low on anxiety, empathy and guilt) displayed elevated levels of behavior problems, regardless of the parenting they received (Oxford et al., 2003; Wootton et al., 1997). However, several studies that did focus on independent scores of the five personality dimensions (e.g., Prinzie et al., 2003; Van Leeuwen et al., 2004) found an interactive effect with parenting, which counters this proposed limitation.

Fourth, several limitations appear as a result of the sample. First, the father sample was too small to identify small or moderate (interactive) effects with this number of predictors

(Green, 1991). Sometimes, results were in expected directions but not significant. Future studies should use larger samples when examining these relationships, making it possible to identify small to moderate (interactive) effects. Furthermore, an at-risk sample instead of community sample was used. Despite the advantage of including children with a range of severity in externalizing problems (Angold & Rutter, 1992), an at-risk sample restricts the generalizability of results.

In addition, several limitations appear regarding the used reporters. First, because both parenting and aggression were assessed at parents, results could be inflated due to shared method variance (O'Connor, 2002). However, this rater bias was reduced by assessing child personality at teachers, which increases the reliability and credibility of results. Another advantage of using teachers is that they know more about children's behavior with peers and can compare behavior with "average" child behavior (Shiner & Caspi, 2003). Nonetheless, it should be mentioned that a structured classroom environment can elicit other "personality types" compared to less structured home situations. This could explain the limited amount of significant relations compared to other studies examining moderating effects of child personality on parenting. However, Prinzie et al. (in press) also used teacher ratings of child personality and they found some relations that were comparable to studies using parent report of personality (e.g., Prinzie et al., 2003). To clarify relations between child personality, parenting and childhood aggression, future research should take into account those considerations, by avoiding rater bias and comparing results from different reporters.

Another limitation of this study is that scores on reactive and proactive aggression were highly correlated, which impedes the discriminant validity of the REPRO and is a problem reported in many studies using comparable instruments (Polman, 2008). It is proposed that this high correlation is an artifact of these instruments, because they include both the form and function of aggression instead of exclusively focusing on the function (Polman, 2008). As a result of this problem, Polman (2008) designed a questionnaire which kept apart forms and functions, the Instrument for Reactive and Proactive Aggression (IRPA). This questionnaire demonstrated good discriminant, convergent, and construct validity (Polman, 2008). Despite the problem with the REPRO, the current study did find different associates for proactive and reactive aggression. Nevertheless, future studies should use the IRPA to examine whether they can replicate results from this study and to determine whether more diverging relations for reactive and proactive aggression exist.

Finally, several limitations appear as a consequence of only using questionnaires. First, Bögels and Brechman-Toussaint (2006) state two biases associated with retrospective

reporting, namely the mood dependency bias and the tendency to explain current problems from past experiences. In addition, they mention a tendency to underreport maladaptive parenting, which could lead to misrepresentations of true relations between parenting and child behavior problems. This could be especially true in this study, where children are selected for an intervention by teachers, while parents do not always see a problem. However, a study by Youngstrom, Loeber and Stouthamer-Loeber (2000) revealed that parents report significantly more problem behavior than teachers, reducing the significance of this limitation. Nevertheless, future studies could increase the reliability and generalizability of results by using a multi-method strategy, which includes observational measures in addition to questionnaires.

Conclusion and practical implications

In conclusion, the above summarized results indicate that a warm, affective relationship is the most important correlate of refraining from more reactive aggression. In addition, a warm, affective relationship with mother and a high level of paternal positive control are the most important parenting associates of less proactive aggression. Furthermore, low levels of child extraversion and high levels of child emotional stability are related to proactive aggression. As a result, child personality seems to be more important for proactive than reactive aggression. No interactive effect of child personality and parenting was found for both subtypes of aggression. The results of this study extend prior research by finding diverging results for reactive and proactive aggression. However, because of cross-sectional data and above mentioned limitations, future research is necessary to gain insight into (interactive) effects of both parenting and child personality dimensions on the development of reactive and proactive aggression in children.

The results have several implications for clinical practice. First, because of significant main effects of parenting, it is important to include parenting interventions when targeting childhood aggression. This implication is supported by a meta-analysis of McCart, Priester, Davis, and Azen (2006), who found that Behavioral Parent Training is more effective for children with antisocial behavior problems than interventions targeted at children. Furthermore, the results indicate that it might be useful to differentiate between subtypes of aggression and to include both parents when designing those parenting interventions. For reactive aggression, it might be useful to improve the quality of the parent-child relationship with both parents. However, when targeting proactive aggression, it might be useful to differentiate between paternal and maternal parenting, with quality of relationship being the

primary focus for mothers and exhibited positive control the primary focus for fathers. Finally, it appears that children exhibiting low extraversion and high emotional stability are possibly at risk for performing (more) proactive aggression. This information can be used when targeting preventive parent management interventions or child behavior interventions (O'Connor, 2002). However, this implication only applies to children who are already aggressive. To conclude, it is clear that not one parenting style fits all externalizing problems and that differentiation between paternal and maternal parenting and reactive and proactive aggression is necessary.

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