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ORIGINAL PAPER

Simultaneously Testing Parenting and Social Cognitions in Children At-Risk for Aggressive Behavior Problems: Sex Differences and Ethnic Similarities

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Abstract In this cross-sectional study we examined a model in which parenting, child social information processing and self-perception are *simultaneously* tested as risk factors associated with aggression. Sex and ethnicity were tested as moderators of associations. The sample consisted of 206 4th grade children in the Netherlands. Parents reported on parenting, parent–child relationship, and reactive and proactive aggression whereas children reported on self-perception and social information processing. Results give support for both child social cognitive functioning and parenting as risk factors associated with aggressive behavior: For all children, a positive parent–child relationship was associated with less aggression, negative parenting was related to less positive self-perception, and deficits in social-cognitive functioning were related to aggression. Multigroup analyses showed ethnic similarities and sex differences in patterns of associations, which might suggest personalized tailor-made interventions for aggressive behavior.

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Introduction

Aggressive behavior is part of the normal development of young children and most children show a decline in frequency and intensity of aggression during the preschool period (Campbell et al. 2006). However, a small group of children (5–11 %) deviates from this normative development of aggression (Campbell et al. 2006). Their aggressive behavior remains stable and becomes problematic, which places them at risk for later-life delinquency, risky behaviors and for developing behavioral disorders (Broidy et al. 2003).

Much research has been dedicated to understanding the etiology of aggression (e.g., Dishion and Patterson 2006). Risk factors for developing aggressive behavior problems include child characteristics (e.g., social cognitive deficits) and characteristics of social contexts (e.g., family characteristics). A significant body of research indicates that unique social cognitive orientations of children predict individual differences in behavior (e.g., Crick and Dodge 1994; De Castro et al. 2002). Moreover, many studies have provided evidence for the relation between dysfunctional parenting and the development of aggressive behavior in children (Dishion and Patterson 2006). In light of the evidence concerning bivariate relations between cognitions and aggressive behavior and parenting and aggressive behavior, there are surprisingly few studies that have simultaneously examined relations between these risk factors (e.g., Haskett and Willoughby 2007; Mize et al. 2000). Therefore, the objective of the current study is to test *simultaneously* how parenting and child social cognitive functioning relate to aggressive behavior.

Child Risk Factor for Aggression: Social Cognitive Functioning

According to the social information processing model, based on social cognitive theory (Crick and Dodge 1994; Dodge 1991), behavior is a result of six mental steps: (1) encoding of cues, (2) interpretation of these cues, (3) clarification of goals, (4) response access or construction, (5) response decision and (6) enacting selected responses. It has been suggested that children with aggressive behavior show problems in their social information processing patterns. Numerous studies have indeed shown atypical social information processing in children with aggressive behavior problems (Crick and Dodge 1994; De Castro et al. 2002). For example, at the encoding stage, aggressive children attend to other cues from social situations (Horsley et al. 2010). When making interpretations, they over attribute hostile intentions to peers and adults when provoked (De Castro et al. 2002). They consequently hold more instrumental and less affiliative goals (Kempes et al. 2008; Salmivalli et al. 1999).They generate less prosocial solutions and are more likely to opt for an aggressive solution (Matthys and Lochman 2005). Children showing reactive aggression, which is an angry emotional reaction to provocations, specifically make more hostile attributions, whereas proactive aggressive children, who use aggression to dominate or intimidate, evaluate aggressive responses more positively (Crick and Dodge 1994; De Castro et al. 2005; Dodge 1991).

In addition to these aspects of social information processing, aggressive children differ from their peers in social cognitive schemas, notably in their self-perception. This is reflected in highly variable self-esteem and self-perceived social competence. Apparently, many aggressive children with such uncertain self-views feel they need to maintain a facade of high status to others (and perhaps even themselves). When their competence or worth is challenged these children try to defend their uncertain self-regard from external threats (e.g., Baumeister et al. 1996). Thus, uncertainty about one's worth or competencies can lead to perceiving others as threatening, hostile and rejecting, which in turn can cause hostile, defensive and aggressive behavior (de Castro et al. 2007). These behaviors supposedly lead to rejection by others, which confirm the child's uncertainty about himself (Donnellan et al. 2005). Especially distorted self-views has been suggested to be related to proactive aggression (Salmivalli 2001).

Social Context Risk Factor for Aggression: Parenting

Besides individual child characteristics, specific parenting factors are related to the development of aggression. Negative parenting, such as inconsistent discipline and overreactivity, is longitudinally related with more aggressive behavior in children (e.g., Snyder et al. 2005), whereas positive parenting (parental involvement, high quality of parent–child relationship) is concurrently associated with less aggression (Wissink et al. 2004).

It has been suggested that the marked influence of parenting on aggressive behavior may operate through its effect on children's social-cognitive functioning (e.g., Dodge et al. 1995; Patterson and Fisher 2002). A set of internal social schemas of others and self, derived from individual experiences, is the knowledge base for social cognitive functioning (Lemerise and Arsenio 2000). From a social learning theory perspective (Bandura 1973), children imitate aggressive behavior when they observe a model being reinforced for aggression. When children experience aggression at home, they become hypersensitive to cues suggestive of hostility and learn that aggression is an 'acceptable' strategy to deal with problems. In this way, children develop cognitive schemas with expectations about themselves and others, which will influence their behavior. Thus, witnessing parents making hostile attributions, setting dominance goals, generating aggressive responses, and enacting aggressive behaviors, should lead to similar social-cognitive and behavior patterns in children. Moreover, lasting experiences of coercive parenting and conflicts, can make children uncertain of their worth and competence. Children's attributions, problem-solving and self-perception in turn are predictive of aggressive behavior (Weiss et al. 1992). There is some empirical evidence that specific parenting practices (harsh parenting) indeed may lead to social-cognitive processing styles (more hostile intent attributions, limited repertoire of problem solving strategies) that in turn cause or maintain aggressive behavior problems (Price and Glad 2003; Weiss et al. 1992).

Aim of the Current Study

In this study we aimed to test child social cognitions and parenting *simultaneously* as risk factors for aggressive behavior, and to study whether individual child characteristics (ethnicity and gender) moderate associations. The tested model (Fig. 1) proposes that both individual child characteristics (SIP and self-perception) and social context characteristics (affective parent–child relationship, positive and negative parenting) are related to aggressive behavior and also transact in their relation with aggressive behavior.

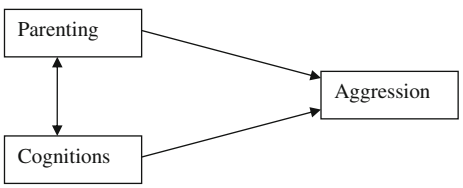

Fig. 1 Hypothesized model

Whereas previous studies focused on a relatively limited range of parenting aspects, mainly physical punishment and harsh parenting, we broaden this scope and include other relevant aspects of parenting: Parent–child relationship, positive and negative parenting techniques. Additionally, we distinguish reactive and proactive aggression, since social-cognitive functioning uniquely predicts these forms of aggression. Previous studies on paths of this model focused mainly on normative non-aggressive samples (e.g., Haskett and Willoughby 2007) or on clinically referred samples (e.g., De Castro et al. 2005). However, we examine these associations in a specific group of highly aggressive elementary school-children nominated by their teachers for participation in an intervention to reduce aggressive behavior. Knowledge about risk factors for developing externalizing behavior in children displaying symptoms of behavioral disorders can result in more adequate preventive indicated interventions.

Ethnic Background as Moderator

Moreover, the inclusion of a large ethnically diverse sample in the Netherlands enables us to study whether the strength of associations varies for specific subgroups. Studies on ethnicity as moderator of associations between parenting, social cognitions and aggressive behavior are relatively scarce and inconsistent (Forehand and Kotchick 1996). For example, Deater-Deckard et al. (1996) found ethnicity to be a moderator of the relation between corporal punishment and externalizing problems. European-American children who experienced physical discipline displayed higher levels of externalizing behavior, but this relation was not found for African-American children. However, other studies found no differences across ethnic groups in associations between parenting and externalizing behavior (Deković et al. 2004; Eichelsheim et al. 2009; Forehand et al. 1997; Rowe et al. 1994). These inconsistencies stress the need to have a closer look at cross-cultural differences in relations between parenting, social cognitions and aggressive behavior. We focus on Moroccan/Turkish versus Dutch children, because Moroccans and Turks are the largest immigrant groups in the Netherlands (Dutch Central Bureau of Statistics 2010) and because these groups share some characteristics (such as immigration history and religion). Moreover, these groups are distinctively different from the Dutch majority group in their cultural values. In the Moroccan and Turkish culture interpersonal relations, collectivism, conformism and social harmony are highly valued. This is in contrast to the Dutch culture where autonomy and independency are important values (Janssens et al. 1999). Due to the limited research it is difficult to formulate specific hypotheses about the moderating role of ethnicity. It is possible that associations are identical in ethnic groups, as has been found in previous studies (Rowe et al. 1994), but also ethnic differences in effects of risk factors were found (Deković et al. 2004; Stevens and Vollebergh 2008). However, based on the globally confirmed social information processing theory (Crick and Dodge 1994), no moderation by ethnicity is expected in associations between child cognitions and aggression.

Sex as Moderator

Moreover, by also including girls, our study has the potential to contribute to our knowledge of the understudied social-cognitive functioning—aggression association in girls (e.g., De Castro et al. 2005). We expect sex differences in associations between risk factors and aggressive behavior. For example, Meece and Mize (2010) found that only for girls hostile attributions were associated with teacher-rated aggression, whereas only for boys children's response generation was associated with aggression. Besides providing information about generalizability of a theory, examining moderators of risk factors for developing aggressive behavior can have important clinical implications. When differences exist, interventions for highly aggressive children should be adapted to specific groups (boys/girls, ethnicity).

Method

Participants

Participants in this study were 206 children (72 % boys, $M_{age} = 10.2$ years, $SD = .60$) and their parents (193 mothers, 128 fathers; $M_{age} = 40.4$ years, $SD = 5.1$). Most of the families (70 %) were intact. Of the children 30 % ($n = 61$) had an immigrant background: One of the parents was born in another country (Dutch Central Bureau of Statistics 2010). For most (85 %) immigrant children, parents were born in Morocco or Turkey.

Procedure

The sample was drawn from 4th-grade classes of 48 elementary schools in two geographic regions in the Netherlands. Children were selected to participate in an individual school-based intervention to reduce externalizing behavior (Stoltz et al. 2011) using a two-stage screening. First, teachers nominated children with the highest levels of externalizing behavior (the top 30 %) and filled in the externalizing scale of the Teacher Report Form (Achenbach 1991). Next, researchers selected children based on T-scores >60, indicating a (sub)clinical level of externalizing behavior (*Mean T-score* = 67.49 (5.58), *range from 60 to 89*). After parents' informed consent was obtained, the

baseline pre-assessment was conducted. These data are analyzed in the current study. Trained assistants collected children's data in their school settings. In two-parent families, both parents filled in questionnaires. For minority parents who did not speak Dutch, translated questionnaires (French, Turkish, English), translators or video-taped translations (Moroccan sublanguage) were used and questionnaires were administered at school. This study was approved by the Dutch Central Committee on Research Involving Human Subjects.

Measures

Aggressive Behavior

Reactive and proactive aggression were measured with an adapted parent version of the Teacher Rating of Aggression (Dodge and Coie 1987). Reliability, factor structure and validity of the TRA are adequate (e.g., Hendrickx et al. 2003). Items were rated on a 5-point scale (1 = *never* to 5 = *always*). The reactive (e.g., 'When my child has been teased or threatened, he/she gets angry easily and strikes back') and proactive (e.g. 'My child threatens or bullies others in order to get his/her own way') subscales both consisted of 3 items (Reactive $\alpha_{fathers} = .80$, $\alpha_{mothers} = .81$; Proactive $\alpha_{fathers} = .80$, $\alpha_{mothers} = .81$). To measure reactive and proactive aggressive behavior as reported by parents, father and mother ratings were averaged when available for both parents ($n = 115$), otherwise single parent ratings were used (correlation between mothers' and fathers' rating was $r > .70$).

Parenting

The Alabama Parenting Questionnaire (Elgar et al. 2007) was used to measure *parental involvement* (10 items, e.g., 'I have a friendly talk with my child', $\alpha_{fathers} = .75$, $\alpha_{mothers} = .70$), *positive parenting techniques* (6 items, e.g., 'I praise my child if she/he behaves well', $\alpha_{fathers} = .82$, $\alpha_{mothers} = .77$), and *inconsistent discipline* (7 items, e.g., 'The punishment I give my child depends on my mood', $\alpha_{fathers} = .65$, $\alpha_{mothers} = .60$). Items were rated on a 5-point rating-scale (1 = *never* to 5 = *always*).

The Parenting Stress Index (Abidin 1983) was used to measure *attachment* (5 items, e.g., 'My child and I have a bad relationship', reverse-coded, $\alpha_{fathers} = .61$, $\alpha_{mothers} = .62$) and *acceptance* (7 items, e.g., 'My child can be difficult; it is not easy to have a child like mine', reverse-coded, $\alpha_{fathers} = .75$, $\alpha_{mothers} = .75$). The items were answered on a scale of 1 (*I totally disagree*) to 4 (*I totally agree*).

Finally, the Parenting Scale (Arnold et al. 1993) was included to assess *overreactive parenting* using a 7-point likert-scale (7 items, e.g., 'When my child misbehaves: I raise my voice or yell', $\alpha_{fathers} = .81$, $\alpha_{mothers} = .80$).

A confirmatory factor analysis resulted in a three factor solution: (1) affective relationship (attachment, acceptance; $\alpha_{parents} = .78$), (2) positive parenting (positive parenting techniques, parental involvement; $\alpha_{parents} = .86$) and (3) negative parenting (inconsistent discipline, overreactivity; $\alpha_{parents} = .75$). The three factors explained 77 % of the variance, with factor loadings of at least .60. Composites of the means of standardized scores of the scales were computed.

Social Information Processing (SIP)

Four hypothetical vignettes were presented to children (SIP test, De Castro et al. 2005). Because specific stories were only interesting and age relevant for boys, we adapted one vignette to the interest of girls after pilot testing. The stories all concerned being hindered by a peer whose intentions are ambiguous. Three aspects of SIP were assessed.

First, *hostile intent attribution* was measured by asking the child immediately after hearing a vignette why the peer in the story might have acted the way that he or she did. Responses were written down by the interviewer and scored as 0 (*benign intent*) or 1 (*hostile intent*). When children generated more than one response, they were asked what they thought was most likely in the specific situation. For intercoder agreement mean kappa was calculated (.95–1.00) and disagreements were resolved through discussions until consensus was reached. An open-answer hostile attribution variable was created by counting the number of stories with hostile answers (0 = *never a hostile attribution* to 4 = *always a hostile attribution*). Furthermore, the child was asked to indicate the peer's intent on a ten-point rating-scale (1 = to be *nice* to 10 = to be *mean*). Scores were averaged over the stories. Because open-answer and rating-scale variables were strongly correlated ($r = .74$), they were combined by standardizing each variable and computing their average ($\alpha = .67$).

Second, *aggressive response generation* was measured by asking children what they would do when the events in the vignette would actually happen to them. Responses were written down by the interviewer and scored 0 (*not aggressive*), 1 (*verbally aggressive or coercive response*), or 2 (*physically aggressive response*) and scores were averaged over the vignettes. Inter-rater's agreement was found to be high: 95 % ($\alpha = .66$).

Finally, *approval of aggression* was measured by presenting a possible aggressive behavioral response to each vignette (e.g., 'if this happens to me, I will hit the child who pushed me'). The child had to indicate on a 10-point scale whether he/she approved of this response (0 = *not good response at all* to 10 = *a good response*). Ratings were averaged over the stories ($\alpha = .77$).

Child Self-perception

Children were asked to fill in the global self-evaluation subscale of the Perceived Competence Scale for Children (Harter, 1982) consisting of 6 items (e.g., 'Some children are happy with themselves' versus 'Other children would like to be someone else'). Children first had to decide which of the items in the pair better described them, then they had to choose between 'sort of true' or 'really true' ($\alpha = .82$, 6 items). Higher scores indicate a positive self-perception.

Statistical Analyses

First, the initial hypothesized mediation model was tested using structural equations in AMOS, without a grouping variable (gender and ethnicity). Next, to test whether associations between parenting, social information processing, self-perception and aggression vary as a function of gender and ethnicity, we evaluated the fit of two separate models. In the first model we examined gender differences by comparing a model in which groups of boys and girls were allowed to differ versus a model in which parameters for boys and girls were constrained to be equal. In the second model we performed the same approach for immigrant children and Dutch children.

The overall goodness of fit of initial models was evaluated using the following fit-indices: root mean square error of approximation (RMSEA) and comparison fit index (CFI). In addition, the normed fit index (NFI) is reported, since it is useful for estimating model fit in small samples. Criteria for good fitting models are for the RMSEA less than .05, and for the CFI and NFI greater than .95 (Kline 1998). Next, multigroup comparisons were used in order to examine the extent to which models were consistent across gender and ethnicity. The first step was to compare a fully unconstrained baseline model (e.g., all path coefficients were estimated separately across groups) to a fully constrained model (e.g., all path coefficients were constrained to be equal across groups). If the unconstrained model showed better fit to the data then the constrained model, we examined which paths were different across groups. Series of sequential unconstrained paths were added based on theoretical considerations and on critical ration indices (values of this index higher than 1.96 indicate significant differences at $p < .05$). The differences between unconstrained, constrained and partially constrained models were examined, using the "decrement-to-χ^2" test.

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Results

Because the child scales 'approval of aggression' and 'aggressive response generation' appeared to be skewed, log transformations were performed. Correlations and means for boys and girls are presented in Table 1. No significant differences in means of aggression, cognitions or parenting were found for ethnicity or sex.

Because associations among variables were comparable for fathers and mothers, we decided to present a combined 'parent model'. To examine sex and ethnicity differences we performed multigroup analyses. Evaluation of the fit of the baseline model, in which all associations between variables were allowed to differ across *sex* provided a good fit (χ^2 (6) = 3.3, RMSEA = .08, NFI = .96). Next, we compared this unconstrained baseline model to a fully constrained model, in which all proposed relations were constrained to be equal for boys and girls. Constraining the linkages did not worsen the fit (χ^2 (28) = 34.3, RMSEA = .03, NFI = .89). Although the fit was not significantly different ($\Delta df = 22$, $\Delta\chi^2 = 21$, $p > .10$) the NFI dropped. Based on critical ratio indices we decided to add a series of sequential unconstrained paths ($n = 4$), resulting in a partially constrained model (χ^2 (25) = 24.9, RMSEA = .00, NFI = .92), which had a significantly better fit than the fully constrained model ($\Delta\chi^2 = 9.4$, $\Delta df = 3$, $p < .05$). For *ethnic* differences, the unconstrained model, in which parameters were allowed to differ across groups, provided a good fit (χ^2 (6) = 11.5, RMSEA = .07, NFI = .98). Constraining the linkages did not worsen the fit significantly ($\Delta\chi^2 = 19.5$, $\Delta df = 22$, $p > .10$). Values of critical ratio indices gave no reason to release specific paths. The fit of the constrained model, with all paths fixed to be equal for immigrant and native Dutch children was adequate (χ^2 (28) = 31.1, RMSEA = .02, NFI = .90).

Table 1 Intercorrelations among assessed variables

	1	2	3	4	5	6	7	8	9	Mean	SD
1 Reactive aggression	=	.67**	−.16	−.02	.04	.19	−.29*	−.09	.29*	2.78	.79
2 Proactive aggression	.52**	=	.01	.06	.02	.15	−.17	−.22	.38**	1.52	.65
3 Self-perception	.06	.13	=	−.27*	.03	−.16	.08	.24^{+}	−.11	3.14	.62
4 Hostile intent	.17*	.14^{+}	.05	=	.25^{+}	.32*	.06	−.11	.01	.31	.31
5 Approval aggression	.08	.15^{+}	−.12*	.29**	=	.51**	.15	−.30*	.18	2.11	1.89
6 Aggressive response generation	.16*	.19*	−.21**	.30**	.54**	=	.07	.13	.06	.71	1.60
7 Affective relationship	−.37**	−.28**	.08	.05	−.09	−.15	=	.41**	−.37**	3.59	.38
8 Positive parenting	−.14^{+}	−.16^{+}	.13	−.02	−.06	−.06	.28**	=	−.38**	3.86	.47
9 Negative parenting	.13	.06	−.21*	.00	.10	.12	−.26**	−.22**	=	.07	.78
Mean	2.99	1.57	3.22	.40[a]	2.46[b]	1.07[b]	3.54	3.93	.01[a]	=	=
SD	.88	.64	.60	.27	2.08	1.69	.39	.40	.76	=	=

Values above diagonal represent girls, below diagonal represent boys

* $p < .05$, ** $p < .01$, $^{+}$ $p < .10$

[a] Standardized means

[b] In analyses log-transformed score is used

These multigroup analyses resulted in a final model, with all paths constrained to be equal for ethnic groups and specific paths released for boys and girls (Fig. 2, for ease of presentation only significant paths are displayed). For all children, higher levels of affective parent–child relationship were related to less reactive and proactive aggression (ß = −.33, $p < .01$ and ß = −.19, $p < .01$, respectively). For girls, we found negative parenting to be related to more proactive aggression (ß = .24, $p < .05$). For all children, negative parenting was related to less positive self-perception (ß = −.15, $p < .05$). Aggressive response generation was related to more proactive aggression (ß = .15, $p < .05$). In addition, the SIP variables were related to each other: higher levels of hostile intent were related to higher levels of approval of aggression (ß = .30, $p < .01$) and to higher levels of aggressive response generation (ß = .12, $p < .05$). Moreover, approval of aggression was positively related to aggressive response generation (ß = .46, $p < .01$). For boys, we found more positive self-perception to be related to more proactive aggression (ß = .17, $p < .05$), and more hostile intent to be related to more reactive aggression (ß = .16, $p < .05$).

Discussion

In a large group of Dutch elementary school children, at-risk for developing stable behavioral problem trajectories

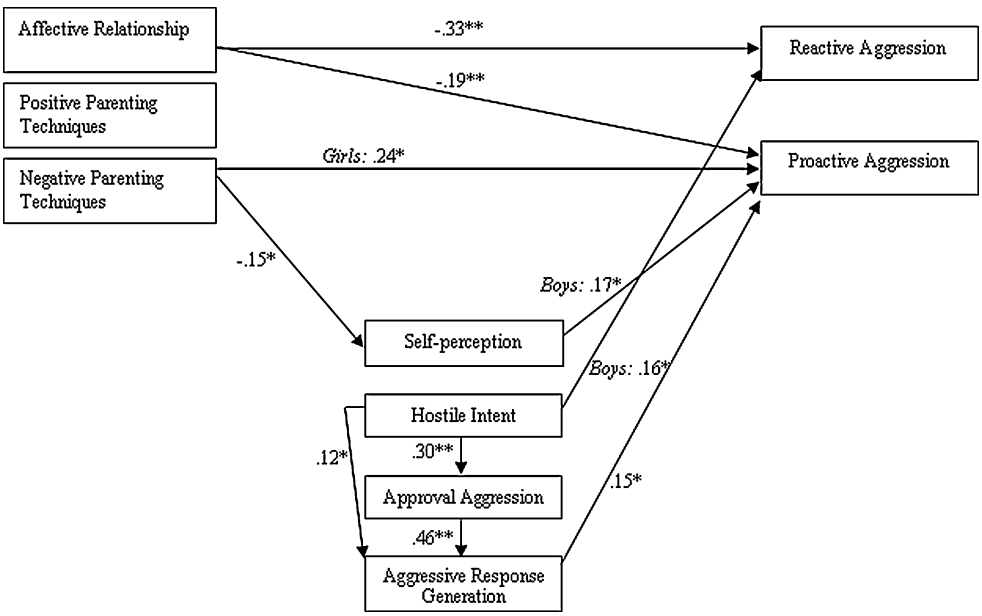

Fig. 2 Significant standardized path coefficients (AMOS). *$p < .05$, **$p < .01$

we investigated whether the risk factors social information processing, self-perception and parenting were concurrently related to aggressive behavior, and whether sex and ethnicity moderated associations.

Child Risk Factor for Aggression: Social Cognitive Functioning

Individual child characteristics, more specifically child social cognitive functioning, have been associated with aggressive behavior (e.g., Lemerise and Arsenio 2000). Results of the current study confirm the relation between social information processing and aggressive behavior, although associations were mainly found for boys. For both *at-risk boys and girls,* the hypothesis of the relation between the SIP-element aggressive response generation (generating aggressive responses in social conflict situations) and proactive aggression was supported. In previous studies (e.g., Crick and Dodge 1994) aggressive response generation was also related to proactive aggression, whereas encoding and attribution of intent were related to reactive aggression. However, the proposed relation between hostile intent attribution and reactive aggression (Dodge 1991), was only found for boys. In a meta-analysis (De Castro et al. 2002) on hostile intent attribution and aggression it was found that girls were underrepresented in studies and therefore sex differences in associations were not examined. The current study contributes to this gap in the literature: Sex differences exist in associations between hostile intent attribution and aggression. As boys and girls did not differ in their mean level of hostile intent, girls attribute hostile intent as well to provoking social situations, but do not necessarily react with reactive or proactive aggression. Perhaps hostile intent in girls is related to relational aggression, which is more common in girls (Crick and Grotpeter 1995). This should be examined in future studies.

With respect to level of self-perception, we found that higher levels of positive self-perception were related to more proactive aggression for boys. This finding supports previous findings about overestimation of own competence, which in turn may result in aggression (Thomaes et al. 2009). Proactive aggression can be seen as instrumental aggression to take possession of things or to dominate or intimidate (Dodge 1991), and therefore is more likely to happen when children are more confident (Salmivalli 2001).

Social Context Risk Factor for Aggression: Parenting

Results of this study support the well-studied relation between parenting and aggressive behavior in children. Consistent with many other studies (e.g., Dishion and Patterson 2006), parenting was related to child aggression, with the strongest association for affective-parent child relationship with less reactive and proactive aggression. Results of the current study emphasize the importance of the parent–child relationship even in this highly aggressive group (Deković et al. 2003) above and beyond parenting behavior. It seems that an affective parent–child relationship in general can 'buffer' the development of more serious aggressive behavior. Moreover, this study provides evidence for the role of parenting techniques in the development of proactive aggression. Dodge (1991) suggested that proactive aggression may be fostered through negative parenting (inconsistent parental discipline, lack of monitoring and control), which encourages children to consider aggression as an acceptable strategy to achieve goals. The results of this study confirm this relation, but only for girls, which may be a result of girls being more sensitive to family processes than boys (Conger et al. 1993).

Child and Parenting Risk Factors Together

In the current study we examined a model in which parenting, child SIP and self-perception were simultaneously tested as risk factors for aggression, but we were also interested how these risk factors transact. In previous studies (e.g., Weiss et al. 1992) it was found that harsh discipline predicted deviations in child's social cognitive style, which in turn predicted aggressive behavior later in life. In the current study we investigated whether the parent–child relationship and specific forms of control were related to cognitions and self-perception. In contrast to our expectations, none of these parenting aspects was related to the child's social information processing. From a social learning perspective, problems in social cognitive functioning are seen as a result of dysfunctional schemas that may be developed by observing a model (parents or peers) who demonstrates inappropriate cognitive problem solving. For example, a child observes a mother's negative verbal reaction in a social situation, which may model the child to be skeptical of intentions of others behavior, which in turn may result in a hostile attribution bias (Nelson and Coyne 2009). Therefore, instead of focusing on several dimensions of parenting behavior, the social information processing style of parents should be included. In addition, it is possible that social information processes are associated more strongly with experiences of being rejected by peers, rather than with general dimensions of parenting (e.g., Nelson and Coyne 2009). The current study extends our knowledge about risk-factors for deviations in SIP: In a specific at-risk group, neither parenting nor quality of parent–child relationship was related to SIP. In contrast, we found parenting to be related to child self-perception: Negative parenting was related to less positive self-perception, which is consistent with social learning theories (Bandura 1973).

Sex and Ethnicity as Moderators

No differences were found across ethnic groups in associations between social-cognitive functioning, parenting and aggression, which is in line with several other studies on parenting and externalizing problem behavior in children of different ethnic origin (Eichelsheim et al. 2009; Rowe et al. 1994). As far as we know, there are no other studies available that examine cross-ethnic differences in associations between parenting, cognitions and reactive/proactive aggression. Results in this study indicate that these associations show a large degree of universality across ethnicity. However, moderating effects for sex were found.

Limitations and Directions for Future Research

Several *limitations* of the current study need to be recognized. First, it should be noted that this study is based on cross-sectional data and to understand predictive values of parenting and social cognitions, replication of this study via longitudinal studies would be necessary. Moreover, assessment of parenting was by self-report, which might lead to underreporting negative and over-reporting positive parenting. Using a multi-method strategy, which includes observational measures in addition to questionnaires, would increase reliability of results. Due to the restriction of range in aggression in this at-risk sample, we might miss relations existing in a normal sample. However, finding specific associations despite these small margins may indicate their robustness. It is important to note that results may not be generalized to younger or older age groups: Associations between parenting, cognitions and behavior might be different for younger children who have not developed all social cognitive skills yet, or for older children, who might be less dependent on their parents. Subsequent studies should replicate the present results in other age samples.

Notwithstanding these limitations, this study contributes to the existing literature on associations between parenting, cognitions and aggression by focusing on an ethnically diverse sample of boys and girls displaying elevated levels of aggressive behavior. Results give support for both child social cognitive functioning and parenting as risk factors associated with aggressive behavior. Little support was found for associations between risk factors, only parenting was related to self-perception, which in turn was related to aggressive behavior. In addition, sex differences in associations were found, but there were no differences across ethnic groups. For interventions aimed to reduce aggressive behavior in at-risk children, it is important to know which child and parenting risk-factors are associated with higher levels of aggression. The present findings, showing that both parenting and child characteristics are independently related to child aggressive behavior, support the notion that including a parent training, in addition to a child intervention can result in a larger change in children's behavior (e.g., Webster-Stratton and Hammond 1997). Although findings should be considered tentative, until replicated with other samples, they raise the question how interventions might be adapted for boys and girls. Perhaps *personalized* tailor-made interventions adapted to child characteristics (i.e., sex) can produce stronger intervention effects (Chorpita et al. 2005).

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