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ORIGINAL PAPER

Early Parenting Intervention: Family Risk and First-time Parenting Related to Intervention Effectiveness

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Abstract The effects of cumulative risk and parity on the effectiveness of a home based parenting intervention were tested in a randomized controlled trial with 237 families with 1- to 3-year-old children screened for high levels of externalizing behavior. The intervention was aimed at enhancing positive parenting and decreasing externalizing behaviors. The results showed that cumulative risk was not associated with either change in child externalizing behaviors or change in positive parenting. When intervention effectiveness was compared for primiparas (i.e., first-time mothers) versus multiparas (i.e., mothers with more than one child), we found that intervention mothers of first-born children displayed an increase in their use of positive discipline strategies as compared to first-time mothers in the control group, whereas a similar effect for multiparas was absent. Among multiparas we found an intervention effect on sensitivity, with control group mothers showing an increase in sensitivity, whereas the intervention group showed a constant level of sensitivity over time. These results suggest that parity may be a moderator of intervention effectiveness. Implications for investigating moderators of intervention effectiveness are discussed.

Keywords Parenting intervention · Parity · Cumulative risk · Externalizing problems · Early childhood

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Introduction

It is well established that negative early parenting increases the risk for the development of adjustment problems in children. In particular, early maladaptive parent–child interactions in relation to the development of externalizing problems (oppositional, overactive, and aggressive behavior) have taken center stage in preventive intervention research (Burke et al. 2002; Hinshaw 2002). Several studies have suggested that the success of a parenting intervention is partly dependent on the parenting context in which the intervention is executed (e.g., Smith et al. 2005). Salient aspects of the parenting context are the level of family risk, and whether the parents are parenting for the first-time. Our goal is to investigate whether cumulative family risk and parity predict the effectiveness of a focused parent intervention program aimed at facilitating positive parenting and reducing child externalizing behaviors.

Child development is impeded or fostered by multiple contributors stemming from the child's caregiving context. In the past, several models have been proposed to describe the ecology of child development. For instance, the ecological model (Bronfenbrenner 1979) and the transactional model (Sameroff and Fiese 2000) both describe factors that affect child development directly or indirectly, ranging from proximal variables such as the interaction between mother and child to more intermediate variables such as marital discord to distal variables such as socio-economic status. They emphasize that child development is dependent on and intertwined with elements of the caregiving context. In the first 4 years of life parenting most profoundly affects child development (Sroufe et al. 2005).

Factors in the caregiving environment, in particular intermediate and distal factors, are also intertwined with parenting. According to Belsky's (1984) model of the determinants of parenting, several caregiving characteristics affect parenting. Belsky (1984) argues that parenting is dependent on personal characteristics of both parent and child, as well as social-contextual or familial influences such as the marital relationship or social support (Woodworth et al. 1996). Parent or family characteristics not only directly affect the parent and—through parenting—child development, but they are also important elements of the context in which an intervention is carried out.

Previous research has shown that several parental risk factors are related to the effectiveness of parenting interventions. For instance, some studies have found that parental depression, psychopathology, and lack of social support each, diminished intervention effectiveness (Kazdin and Wassell 1999; Smith et al. 2005; Webster-Stratton and Hammond 1990). These studies suggest that parents experiencing high levels of stress may be less involved in and committed to the intervention, resulting in less positive outcomes (Kazdin and Wassell 1999; Lundahl et al. 2006). However, other studies have shown that maternal depression, lack of psychological resources, low marital satisfaction, and low educational level were *positively* related to the effectiveness of parenting interventions (Beauchaine et al. 2005; Berlin et al. 1998; Lundahl et al. 2006; Olds et al. 1999; Olds and Korfmacher 1998; Reid et al. 2003; van Zeijl et al. 2006a). It may be that adverse family circumstances lead to

increased intervention effectiveness, because these families are in greatest need of support (e.g., Beauchaine et al. 2005).

These conflicting results and interpretations may reflect the notion that it is not the nature but the number of risk factors that is relevant to the investigation of family functioning and child development (Atzaba-Poria et al. 2004; Rutter 2000; Sameroff and Fiese 2000; Sameroff et al. 1993). Specific risk factors may increase or decrease intervention effectiveness, depending on the presence of other risk factors, emphasizing the need to investigate cumulative risk. Some cross-sectional and longitudinal studies have focused on cumulative risk in relation to parenting (e.g., Crnic et al. 2005), others on child outcomes (e.g., Deater-Deckard et al. 1998; Sameroff and Fiese 2000). To our knowledge, only two studies reported about the influence of cumulative family risk on the effectiveness of early childhood *interventions* on child behavior outcomes (Liaw and Brooks-Gunn 1994; Nair et al. 2003). One of these (Nair et al. 2003) also reported on the association between cumulative risk and change in parental *attitudes* after intervention. No studies were found that investigated how cumulative risk influences *parenting practices*. This issue is in need of further investigation (Reyno and McGrath 2006), because most early childhood interventions aim at enhancing parenting practices in order to change child behavior.

One of the intervention studies investigating cumulative risk is the study of Brooks-Gunn and colleagues (Berlin et al. 1998; Liaw and Brooks-Gunn 1994). Evaluating the Infant Health and Development Program for low-birthweight infants, they investigated cumulative risk, including maternal education, maternal stress, social support, and maternal well-being. The parenting intervention was equally effective in enhancing child IQ scores in families with high levels of risk ($\geq$5) as in families with low levels of risk (<5). However, when poor families with different levels of risk were compared, differential intervention responses were found in favor of poor families experiencing fewer than five risk factors compared to poor families with more than five risks, suggesting that extreme accumulation of risk may diminish intervention effectiveness (Liaw and Brooks-Gunn 1994). No such differences were found for non-poor families.

In Nair et al.'s (2003) intervention study, aimed at enhancing communication between mothers with substance abuse and their children by teaching them how to create a stimulating play environment, the effects of the intervention on child psychomotor and mental development were not moderated by the number of risks. However, the number of risks was related to parental attitudes, but not to intervention effects on parental attitudes. Parenting stress and potential for child abuse were higher for women with five or more risks compared to women with fewer risks.

These studies however, only investigated child outcomes, not actual parenting behaviors. In sum, results regarding cumulative risk and differential intervention effectiveness so far remain limited and equivocal, and scarce as far as parental change is concerned.

Studies of the transition to parenthood highlight the challenges of caring for a first-born child (e.g., Heinicke 1995). When a second child is born, parenting is subjected to change (Demo and Cox 2000). For instance, research has shown that

first-born and later-born children are treated differently by their parents, and that this differential treatment is predictive of variations in child development (Dunn and Plomin 1991). Compared to later-born children, first-borns tend to receive more attention in terms of interaction and affection, and their mothers are less controlling (Dunn 1985; Dunn et al. 1986; Keller and Zach 2002). Similarly, maternal sensitivity was found to decrease from older to younger siblings, which may be due to the competing demands of responding to two children at the same time (Teti et al. 1996; van IJzendoorn et al. 2000).

Although many parenting intervention studies explicitly restrict their samples to primiparas (i.e., first-time mothers; e.g., Heinicke et al. 1999; Klein Velderman in press; Olds et al. 2002), they often refrain from explaining this choice. It is likely that this choice is based on the common sense assumption that parenting practices with a first-born child are more easily influenced as opposed to those of mothers who already have parenting experiences with another child (Whiteman et al. 2003). Multiparas (i.e., mothers with more than one child) may already have developed more rigid patterns of parenting beliefs and behaviors, based on experiences with their first-born (Scott and Hill 2001). However, this assumption has never been tested.

Several intervention studies among first-time parents demonstrated improvement in parenting. For instance, Olds et al. (2002) found that first-time mothers who received home visits provided children with a more stimulating environment through more appropriate play materials, more language stimulation, and less use of harsh discipline than first-time control mothers. Similar results were reported by McDonald-Culp et al. (2004), who provided home visits that started in the prenatal period. Compared to control group mothers, the intervention mothers made greater use of community services, provided safer home environments, had a better understanding of discipline strategies, and were more accepting and respectful to their infants. In addition, Heinicke et al. (1999) found that home visitors were able to enhance maternal parenting behaviors such as responsiveness. Moreover, first-time intervention mothers used less negative discipline strategies compared to first-time control mothers. Finally, Klein Velderman et al. (in press) intervention study showed that primiparas who received video-feedback and written information on child development, or additionally took part in discussions about their own childhood attachment experiences in relation to their current caregiving, displayed more sensitivity to their child than primiparous mothers in the control group.

Interventions aimed at later-born children instead of first-borns may be equally effective, as was illustrated by Brotman et al. (2005). They selected families with first-born children showing antisocial behavior, but the family-based intervention was aimed at the second child, who was assumed to be at risk for conduct problems given the status of the first child. Nevertheless, the older siblings of the target children also profited from the positive intervention effects on parenting. Similarly, results from an early intervention program for parents of first-born children by Seitz and Apfel (1994) showed that 10 years after the intervention later-borns also appeared to have benefited from the program.

Parenting intervention studies thus showed that these interventions can be beneficial to both families with first-born and later-born children. However, these

studies did not provide a direct comparison of parity. The question rises whether interventions aimed at first-borns are more effective than interventions aimed at later-borns. We know of only one study by Fraser et al. (2000) that directly compared the effectiveness of parenting interventions in these two naturally occurring groups. Their intervention aimed at reducing the risk for child abuse and neglect by enhancing parenting for primiparas and multiparas proved to be particularly successful for primiparas. After the intervention, they showed less postpartum depression and higher levels of self-reported parenting competence than primiparas in the control group, although no differences were found in parenting as measured with the HOME Inventory. Multiparas only significantly reported fewer depressive symptoms after the intervention than multiparas in the control group. No changes in parenting competence were found. However, this study aimed at families at risk for child abuse and neglect, and the results may not be generalizable to other families. In addition, because there were no differences in actual parenting as a result of the intervention, the question whether it is more effective to intervene with primiparas as opposed to multiparas remains open for investigation.

In the present study we evaluated family context characteristics in association with changes in parenting and child externalizing behaviors after a preventive intervention program aimed at enhancing sensitivity and adequate discipline strategies for mothers of young children with high levels of externalizing behaviors. Using a randomized control trial, our intervention program has been shown to enhance maternal sensitive discipline in the intervention group compared to mothers in the control group (see van Zeijl et al. 2006a). In addition, the intervention was effective in reducing child overactive behaviors, particularly in families showing high levels of marital discord and daily hassles, suggesting moderation of family context variables. No moderating effects were found for maternal well-being. The current study sought to extend the previous work by examining the influence of accumulated family contextual risk on parenting and child externalizing behaviors, as well as differences in intervention effectiveness in primiparas versus multiparas. Whereas van Zeijl et al. (2006a) considered associations of each of the risk factors separately with both child and parent outcomes, the current study investigated the effects of the multiple risk factors as combined in a cumulative risk index (cf., Guttman et al. 2003; Sameroff et al. 1993).

Based on previous research, we hypothesized that cumulative risk does influence intervention effectiveness on parenting and externalizing behaviors. Although not all studies pointed into the same direction, several studies demonstrated negative effects on parenting as well as negative developmental child outcomes when multiple risk factors coincide. Considering these negative effects, families experiencing more risk may have more to gain from intervention efforts than families with fewer or no risks present. Cumulative risk has often been studied in high-risk samples, such as low socio-economic families, but has not often been investigated as a potential stressor in relatively low-risk families. Although risks generally showed a higher incidence in families living in more adverse circumstances, more privileged families might also experience risks like marital discord, psychopathology, and lack of social support. In the current study, we examined the role of multiple risk factors in relation to intervention outcomes in families with

relatively high socio-economic backgrounds. Further, we hypothesized that first-time mothers benefited more from the intervention than multiparas, since they are at the start of developing parenting beliefs and practices. In contrast to multiparas who may have more rigid beliefs and practices, first-time parents may be more open to intervention efforts. Primiparas may thus benefit more from the intervention than multiparas, which may in turn lead to more improvements in child behavior.

Method

The SCRIPT Study

The Dutch SCRIPT study (Screening and Intervention of Problem behavior in Toddlerhood) is a collaboration between Leiden University (Centre for Child and Family Studies) and the Vrije Universiteit Amsterdam (Department of Developmental Psychology). The study investigates the effectiveness of an early intervention program aimed at reducing externalizing problems in 1-, 2-, and 3-year-old children by enhancing maternal sensitivity and adequate discipline strategies. It consists of a screening phase in a general population sample and a randomized case–control intervention phase in a selected subsample of children with high levels of externalizing behavior problems.

Participants

During the screening phase participants were recruited through town hall records from several cities and towns in the Western region of the Netherlands. Children aged 10–15 (1-year-olds), 22–27 (2-year-olds), and 33–40 months (3-year-olds) were selected between May 2001 and December 2002. Because the screening phase of the SCRIPT study was designed to provide participants for the intervention study, sample homogeneity in terms of cultural background (Dutch) was important for statistical reasons (power) and practical reasons (possible cultural/language difficulties in home visits). Therefore, children who had both a non-Dutch surname and non-Dutch first name were not included in the target sample. Parents of 4,615 eligible children were asked to complete several questionnaires on child and family aspects sent by mail. We obtained 2,408 questionnaires from primary caregivers (response rate 52%). The large majority of children (95%) were living with two parents, with the biological mother as the primary caregiver and a father Figure (biological or stepfather) as the second caregiver. To ensure a homogenous sample, only children living in these families were eligible for the intervention study. This selection and the application of several other exclusion criteria (e.g., twins, serious medical condition in child or mother) resulted in the exclusion of 454 cases, leaving a target selection sample of 1,954 children. Selection for the intervention study was based on the Child Behavior Checklist for 1½- to 5-year-old children (CBCL/1½–5; Achenbach and Rescorla 2000). For each age group, children with scores above the 75th percentile on the CBCL syndrome Externalizing Problems (age 1: scores $\geq$13; age 2: $\geq$19; age 3: $\geq$20) were selected for the intervention study ($N = 438$). Mothers

of 246 children (56%) agreed to participate and were invited for a 1½-h visit to the laboratory for a pretest. During the intervention phase, 9 families withdrew from the study, leaving 237 children and their mothers in the intervention study sample. There were no significant differences between the selected families that fully participated in the intervention phase ($N = 237$) and those who did not participate ($n = 201$), regarding initial level of child externalizing behaviors ($P = .99$), child age ($P = .18$), child gender ($P = .84$), presence of siblings ($P = .98$), quantity of child care ($P = .82$), first-time motherhood ($P = .70$), and maternal age ($P = .07$). The only statistically significant difference was found for educational level of mothers, $\chi^2(1, N = 436) = 13.18$, $P < .01$, partial $\eta^2 = .03$ and fathers, $\chi^2(1, N = 430) = 9.52$, $P < .01$, partial $\eta^2 = .02$, with participating parents having a higher educational level than non-participating parents.

About 56% of the participating children ($N = 237$) were boys and over half of the children had siblings (59%). The mean age of the mothers was 33 years ($SD = 4.22$, range 20–45) and the majority of the parents had a high educational level (one or both parents with Bachelor's or Master's degree in 64% of the sample). After the pretest, children from each age group were randomly assigned to the intervention group ($n = 120$), or the control group ($n = 117$). There were no differences between both groups regarding initial level of child externalizing problems ($P = .13$), child age ($P = .85$), presence of siblings ($P = .67$), maternal age ($P = .97$), first-time motherhood ($P = .63$), and maternal educational level ($P = .94$). There were however, more girls in the intervention group (51%) than in the control group (38%), $\chi^2(1, N = 237) = 4.20$, $P < .05$. Overall, the intervention sample ($N = 237$) was homogeneous. Only two-parent families participated, with few low educated mothers (1% finished elementary school), and the sample included no adolescent mothers.

Procedure

The pretest laboratory sessions were conducted by female instructors and assistants, unknown to the mothers and children. The mean time between the screening and the pretest was 3.85 months ($SD = 0.90$, range 0.83–6.37); mean age of the children at the pretest was 26.99 months ($SD = 9.98$, range 13.58–41.91). During the 1½-h laboratory session, mother and child completed several tasks, including solving puzzles, free play, cleaning up, prohibition to touch toys, and waiting for a treat (coded afterwards from videotapes with observational measures by coders unaware of experimental condition and other data concerning the participants). In addition, mothers were asked to complete some questionnaires.

Families in the intervention group received six home visits over a period of 8 months and, parallel in timing, families in the control group received six telephone calls. Approximately 1 year after the pretest ($M = 12.41$ months, $SD = 1.14$, range 8.25–19.49), families from both the intervention and control group visited the laboratory for the posttest, using the same procedures as the pretest. Mean age of children at the posttest was 39.41 months ($SD = 10.11$, range 25.31–56.97).

Intervention Program

For the intervention group, a female intervener went into the homes of the families to provide personal feedback on parenting, using videotaped mother–child interactions, as well as information on the development of young children in general. Ten interveners were extensively trained to implement the intervention and received weekly feedback sessions with trainers during the intervention phase. The first 4 intervention sessions took place every month, the last two sessions (booster sessions) every other month.

The SCRIPT study applied the video-feedback method known as the Video-feedback Intervention to promote Positive Parenting (VIPP; Juffer et al. in press), a method used in previous intervention studies that has been demonstrated to be effective in enhancing maternal sensitivity (Bakermans-Kranenburg et al. 1998; Juffer et al. 1997). The VIPP program was extended to include information and advice regarding parental discipline, in addition to the focus on parental sensitivity, resulting in VIPP-Sensitive Discipline (VIPP-SD, Mesman et al. in press). Standardized protocols were used for implementation. The VIPP-SD program aims at enhancing maternal observation skills, knowledge of parenting and the development of young children, empathy for the child, sensitivity, and sensitive discipline strategies, in order to prevent and reduce child externalizing problems. For a full description of the VIPP-SD interventions sessions see Mesman et al. (in press).

Control Condition

Parallel to the intervention sessions, the mothers in the control group received six telephone calls. This 'dummy intervention' was implemented to ensure comparable motivation and attention in the intervention and control group and to prevent selective attrition (Juffer et al. 2005). In the telephone calls, mothers were invited to talk about the general development of their child (e.g., eating, sleeping, playing), using a semi-structured interview. Control group mothers received no advice or information about child development in general or (the development of) problem behavior in their child. Requests for advice or information were minimized by the use of concrete questions, inviting mothers to talk extensively about their child. If mothers did ask for advice or information, they were suggested to consult their general practitioner or well-baby clinic.

Measures

Internal consistencies of questionnaire scales were computed in the general population-screening sample (N = 2,408), with the exception of the questionnaires for maternal psychopathology and the child externalizing behaviors which were only completed by the intervention study sample (N = 237).

Externalizing Behaviors

The widely used and extensively validated Child Behavior Checklist for 1½- to 5-year-old children (CBCL/1½–5; Achenbach and Rescorla 2000) was used to

measure externalizing problems, and was completed by the mothers during the laboratory sessions. The mothers indicated whether their child displayed any of the 100 behavioral descriptions in the last 2 months on a 3-point scale (0 *not true*, 1 *somewhat or sometimes true*, and 2 *very true or often true*). Using confirmatory factor analysis, van Zeijl et al. (2006b) found that the broadband Externalizing Problems scale reported for 2- and 3-year-olds by Koot et al. (1997) was also applicable to 1-year-old children. To investigate to what extent specific aspects of externalizing problems were affected by the intervention, the three narrowband Externalizing Problems scales were used in this paper, i.e., Overactive (5 items), Oppositional (17 items), and Aggressive (9 items). The internal consistencies (Cronbach's α) were .66, .89, and .75, respectively.

Difficult Temperament

Difficult child temperament was also taken into account, because of the conceptual and statistical associations with externalizing behaviors. Child temperament (as perceived by the mother) was measured during the screening phase with the Infant Characteristics Questionnaire (ICQ; Bates et al. 1979). The ICQ was translated into Dutch and found valid and reliable (Kohnstamm 1984). It contains 33 items, describing specific observable behaviors in well-defined situations. The items were rated on a 5-point scale, ranging from 0 *not true* to 4 *true*. Because the ICQ was used in combination with the Child Behavior Checklist (CBCL/1½–5; Achenbach and Rescorla 2000), five items in the ICQ were discarded due to content-overlap between items of both questionnaires. Next, a one-component analysis was carried out in each age group to derive an overall difficultness factor (for more details see van Zeijl et al. 2006a). The difficultness factor consisted of 14 items in 1-year-old children, 18 items in 2-year-olds, and 16 items in 3-year-old children. Internal consistencies (Cronbach's αs) were .68, .76, and .75, respectively. Scale scores were computed by averaging item scores.

Maternal Sensitivity

The mothers' sensitivity was observed in the laboratory sessions during a series of problem-solving tasks. In the pretest, dyads were given three tasks during a total time of 15 min; in the posttest they were given two tasks in 10 min. Mother and child were asked to solve puzzles that were too difficult considering the age of the child (different puzzles were used in each age group) and mothers were instructed to help their child in the way they usually did. The mothers' *Supportive presence, Intrusiveness*, and *Clarity of Instruction* were rated on 7-point scales, using the Erickson scales (Egeland et al. 1990). The average intraclass correlation (single rater, absolute agreement) for intercoder reliability (for all separate pairs of seven coders) was .75 (range .71–.80; $n = 30$). An overall *Sensitivity* rating was computed. To this end, scores for the separate tasks were averaged, Intrusiveness scores were reversed, and, because the three subscales were not equally distributed, subscale scores were standardized before adding up.

Maternal Discipline

Maternal discipline strategies were observed in the laboratory sessions during a 10-min 'don't' task. The child was shown a treat, which was subsequently given to the mother with the (written) instruction to refrain from giving the treat to the child until the end of the session, 10 min later. During this task, the mother was asked to fill in a questionnaire as a competing demand, while the child had nothing to play with for the first 5 min and was offered toys to play with for the last 5 min. All maternal discipline strategies were coded, whether or not they concerned the forbidden treat (e.g., they could also concern the toys). Coding procedures were based on Kuczynski et al. (1987), and Van der Mark et al. (2002). The following positive maternal discipline strategies were observed: *Distraction* was coded when mothers redirected the child's attention by giving an alternative to the present situation or the child's behavior. *Induction* referred to mothers' explanations of why the child was not allowed to do something or of the consequences of the child's behavior. Finally, *Understanding* was coded when mothers displayed interest in or understanding of the child's feelings or thoughts. Coding was ended before the intended 10-min duration if mothers completely gave in by handing the child the treat. For 1-year-old children (both in the pre- and posttest), the duration of this task was set at 8 min, because of the fatiguing length of the laboratory session for children in this age group. Therefore, the exact duration of the 'don't' task varied from 3 to 10 min and all frequencies were recomputed to standard 10-min durations. The average intraclass correlation (single rater, absolute agreement) for intercoder reliability (for all separate pairs of five coders) was .85 (range .61–.95; $n = 30$). An overall *Positive Discipline* score was computed by adding the frequencies of the three positive discipline strategies (factor loadings were .79, .57, and .78 respectively). Because the three subscales were not equally distributed, subscale scores were standardized before being summed.

Cumulative Risk

The *cumulative risk* variable consisted of the following family context variables: marital discord, lack of social support, daily hassles, physical health problems, low maternal educational level, and maternal psychopathology. The measures for each of the specific risk variables are described below. Except for maternal psychopathology, which was measured during the pretest, all data were collected during the screening phase of the SCRIPT study. Total scores for each of these variables were standardized and then summed, so that higher values indicated higher risk. Cumulative risk is often calculated by applying cutoff points to dichotomize each risk factor (absent versus present) and then summing these dichotomous variables into a variable reflecting the total number of risk factors (cf. Sameroff and Fiese 2000). However, because these cutoff points are arbitrary, we prefer to use the standardized interval variables (cf., Atzaba-Poria et al. 2004). In the current study, the correlation between these two different calculations of the cumulative variable was high, $r = .88$, $P < .01$. Figure 1 displays how the numbers of risks are distributed in the sample.

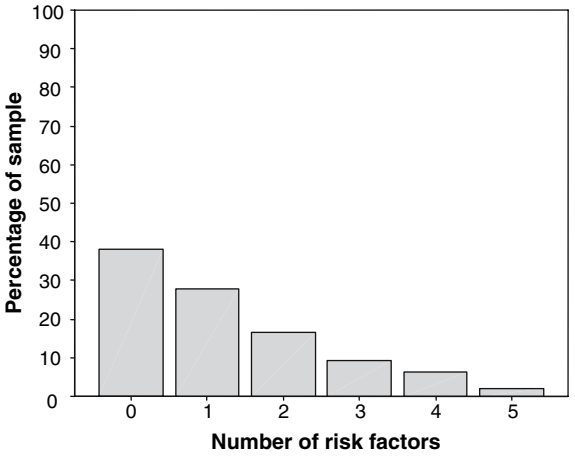

Fig. 1 Distribution of risk factors in the sample ($N = 237$)

A subscale of the Dutch Family Problems Questionnaire (Koot 1997) was used to assess *marital discord* during the screening phase. The mothers indicated on a 3-point scale whether five statements about their partner relationship and partner support were 0 (*not true*), 1 (*somewhat or sometimes true*), or 2 (*true or often true*). A total score was computed by summing item scores. The internal consistency (Cronbach's α) for this scale was .66.

Mothers also rated their *Satisfaction with social support* on a social support questionnaire, based on the Social Support Scale (Van den Boom 1988; Westgeest 1985). Mothers were asked to indicate whether or not they were satisfied with the social support they received, concerning 15 different sources of support (e.g., partner, extended family, community), rated on a 5-point scale ranging from 0 (*not satisfied*) to 4 (*very satisfied*). In the present study, the internal consistency (Cronbach's α) for satisfaction of support was .78. For our analyses this scale was reversed to indicate *dissatisfaction* with social support.

Further, the mothers were asked to rate the intensity of 25 potentially *daily hassles*, i.e., stressful events, such as money problems or troubles at work (Kanner et al. 1981). The intensity of daily hassles experienced by the mothers was rated on a 5-point scale for each event with 0 (*no hassle*) to 4 (*big hassle*). A total score was computed by summing all item scores. Internal consistency (Cronbach's α) for this scale was .87.

Maternal *physical health problems* were measured using a single-item indicator of mothers' own perception of their current health status, ranging from 1 (*very well*) to 5 (*very bad*).

Maternal *educational level* was measured by a single item question. Mothers rated their highest completed level of education, ranging from 1 (*Elementary school*) to 5 (*Master's degree*). This variable was recoded so that a higher score reflected a lower level of education, indicating higher risk.

Finally, an abbreviated version of the Young Adult Self-Report (YASR; Achenbach 1991) was used to measure level of *maternal psychopathology*. The

questionnaire consists of 29 items, rated at a 3-point scale with 0 (*not true*), 1 (*somewhat or sometimes true*), or 2 (*true or often true*). Mothers completed this questionnaire at the end of the pretest laboratory session. Items reflect the level of internalizing and depressive symptoms. A total score was computed by summing item scores. Internal consistency (Cronbach's α) for this scale was .89.

Statistical Analyses

There were some missing values (1.2% of the data) on the screening variables ($n = 1$ for marital discord, $n = 2$ for daily hassles, and $n = 14$ for maternal psychopathology), pretest measures ($n = 8$ for maternal discipline), and posttest outcome measures ($n = 1$ for maternal sensitivity and $n = 3$ for maternal discipline). Because these missing values were randomly distributed across items and subjects, missings were substituted with the mean score on the variable for children with the same gender, age, parental educational level, and experimental condition, as a conservative imputation method (Tabachnick and Fidell 2001), in order to uniformly include the total set of 237 children in the analyses. Results were similar when missing data were excluded from the analyses.

Outliers were found for marital discord, daily hassles, maternal psychopathology, social support, and observed maternal discipline strategies at the pre- and posttest. Following Keppel and Wickens (2004), who stated that ''any distribution of data is likely to contain some extreme scores. Real data often are a little more scattered than a normal distribution. These observations are a valid part of the distribution and should be included in the analysis'' (p. 146), these data were not excluded. However, when outliers ($z > |3.29|$) were winsorized (i.e., ''moved in close to the good data''; Hampel et al. 1986, p. 69) by replacing the outlying scores with the next highest value (with a $z < |3.29|$) in the distribution, results were similar.

To investigate intervention effects, we applied repeated measures MANOVAs to examine pretest–posttest changes. Gender of the child and child age in months were entered as covariates, because of gender differences between the intervention and control group, and the broad age range at the posttest, 27–57 months. Experimental condition and cumulative risk (below the median versus above the median) were entered as factors. To avoid problems of multicollinearity between predictors and interaction terms, we used unweighted effects coding for the dichotomous variables (experimental condition and child gender; Cohen et al. 2003). Because the sensitivity, discipline, and the cumulative risk factor were standardized, there was no need to center these variables.

Results

To check whether random experimental group assignment had been successful in preventing initial group differences, we investigated differences between the intervention group and the control group using independent sample *t*-tests for primiparas and multiparas, the cumulative risk variable, and parenting variables at the pretest. No significant differences were found between the intervention and

control group for any of the family context or pretest variables (*P*s > .09). Similarly, no significant differences on the cumulative risk variable, pretest sensitivity, and pretest positive discipline were found for primiparas (*P*s > .20) nor for multiparas (*P*s > .35). Subsequently, associations of the covariates age and gender of the child among families with a first-born or a later-born child with the cumulative risk variable, and pretest and posttest variables were examined, using correlations and independent sample *t*-tests. Mothers of girls reported more aggressive behaviors at the pretest and the posttest. Overall, mothers of younger children used more positive discipline than mothers of older children. This association was found for primiparas both at the pretest, $r\ (130) = -.34$, $P < .01$, and at the posttest, $r\ (130) = -.28$, $P < .01$; as well as for multiparas at the pretest, $r\ (107) = -.33$, $P < .01$, and at the posttest, $r\ (107) = -.32$, $P < .01$. Only primiparas showed more sensitivity towards older children than towards younger children at the pretest, $r\ (130) = .20$, $P < .05$. For multiparas there was no difference. In addition, there were no significant differences for child gender on any variable in the primiparous and the multiparous group (*P*s ranging from .07 to .83).

Table 1 shows the means and standard deviations for all predictor and outcome variables for primiparas and multiparas, and Table 2 shows the correlations among these variables. Primiparas with higher levels of cumulative risk showed significantly less sensitivity during the pretest and posttest and less positive discipline strategies during the pretest, whereas multiparas reporting more cumulative risk displayed significantly less sensitivity during the pretest, and less positive discipline during the posttest. Significant positive within-construct longitudinal correlations (pretest to posttest) were found for child externalizing behaviors, the sensitivity and positive discipline measure at pretest and posttest for both primiparas and multiparas.

Main Analyses

Family Contextual Risk Related to Intervention Effects

Results on the general effectiveness of the intervention have been reported previously and are summarized here for clarity (for details see Stolk et al. in press; van Zeijl et al. 2006a). The intervention was effective in increasing maternal use of positive discipline. In addition, in families with high marital discord and families with high levels of daily hassles the intervention was especially effective in decreasing overactive child behaviors.

A repeated measures MANOVA with experimental condition as between-subjects factor and time as within-subjects factor was performed to assess the association between family contextual risk and intervention effectiveness on *parenting*: maternal sensitivity, and positive discipline. Treatment effectiveness was unrelated to child sex, age, and temperament, as well as to the level of daily hassles, marital discord, and satisfaction with support, physical health, maternal education, and psychopathology.

To test whether family contextual risk affected changes in *child behaviors* (overactive, oppositional, and aggressive behaviors), a repeated measures MANCOVA was conducted with experimental condition as between-subjects factor and

Table 1 Descriptive statistics for primiparas and multiparas for all measures

Measures	Primiparas						Multiparas					
	Total n = 130		Control n = 66		Intervention n = 64		Total n = 107		Control n = 51		Intervention n = 56	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Child characteristics												
Gender	1.45	0.50	1.41	0.50	1.48	0.50	1.44	0.50	1.33	0.48	1.54	0.50
Age[a]	39.25	10.42	39.81	10.86	38.68	10.00	39.59	9.77	38.45	9.06	40.63	10.34
Difficult temperament	1.87	0.51	1.87	0.46	1.87	0.56	1.90	0.54	1.87	0.51	1.94	0.56
Pretest externalizing												
Overactive	4.57	1.64	4.68	1.62	4.46	1.67	4.13	1.77	4.16	1.64	4.11	1.89
Oppositional	15.61	5.74	15.38	6.07	15.85	5.41	15.47	5.87	15.62	5.67	15.34	6.10
Aggressive	4.87	2.55	5.00	2.35	4.73	2.75	5.39	2.85	5.49	2.68	5.30	3.02
Posttest externalizing												
Overactive	4.25	1.94	4.56	1.77	3.92	2.06	3.28	1.71	3.39	1.88	3.18	1.55
Oppositional	14.81	5.56	15.02	5.51	14.59	5.65	13.79	5.80	14.24	6.34	13.38	5.28
Aggressive	4.55	2.76	4.42	2.51	4.69	3.01	5.18	3.45	5.51	3.75	4.88	3.16
Family context												
Cumulative risk[b]	−0.38	3.89	−0.52	3.86	−0.22	3.97	0.46	3.36	0.47	3.36	0.45	3.40
Pretest parenting												
Sensitivity[b]	0.06	2.34	−0.14	2.40	0.26	2.28	−0.07	2.24	−0.28	2.33	0.13	2.17

Table 1 continued

Measures	Primiparas						Multiparas					
	Total n = 130		Control n = 66		Intervention n = 64		Total n = 107		Control n = 51		Intervention n = 56	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Positive discipline[b]	0.21	2.17	0.45	2.19	−0.04	2.14	−0.26	2.12	−0.32	2.04	−0.20	2.21
Posttest parenting												
Sensitivity[b]	−0.20	2.41	−0.43	2.61	0.03	2.19	0.26	2.16	0.56	2.08	−0.02	2.09
Positive discipline[b]	−0.00	2.05	−0.27	1.78	0.28	2.27	0.00	2.13	−0.48	1.48	0.44	2.52

[a] Child age at posttest in months

[b] Standardized values

Table 2 Univariate correlations among all variables

Measures	Multiparas													
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Child characteristics														
1. Gender	–	−.01	−.03	−.12	.02	−.34**	−.10	−.02	−.33**	−.02	.14	.11	.09	.06
2. Age[a]	.10	–	−.08	.27**	.42**	.13	.19	.20	−.08	.00	−.04	−.33**	−.13	−.32**
3. Difficult temperament	−.03	−.04	–	.19*	.33**	.25**	.23*	.31**	.36**	.18	−.04	.13	−.09	.22*
Pretest externalizing														
4. Overactive	.09	.21	.17*	–	.48**	.39**	.51**	.41**	.23*	.17	−.27**	−.04	−.31**	−.00
5. Oppositional	.16	.44**	.23**	.42**	–	.49**	.43**	.60**	.24*	.06	.01	−.10	−.10	.04
6. Aggressive	−.18*	.30**	.13	.21**	.42**	–	.38**	.46**	.61**	.15	−.18	−.08	−.11	.00
Posttest externalizing														
7. Overactive	.07	.08	.15	.63**	.24**	.15	–	.58**	.48**	.28**	−.27**	−.18	−.19*	.04
8. Oppositional	.08	.34**	.08	.37**	.59**	.30**	.42**	–	.58**	.27**	−.13	−.21*	−.17	.01
9. Aggressive	−.26**	.09	.12	.03	.21*	.52**	.18*	.43**	–	.29**	−.23*	−.09	−.12	.05
Family context														
10. Cumulative risk[b]	−.15	.13	.19*	.25**	.27**	.34**	.28**	.27**	.22*	–	−.18	−.24*	−.22*	−.02
Pretest parenting														
11. Sensitivity[b]	.16	.20*	−.07	−.13	.10	−.20*	−.25**	−.01	−.20*	−.30**	–	.14	.43**	−.05
12. Positive discipline[b]	−.09	−.34**	.07	−.10	−.20*	−.20*	−.09	−.15	−.04	−.25**	.07	–	−.06	.28**

Table 2 continued

Measures	Multiparas													
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Posttest parenting														
13. Sensitivity[b]	.09	.15	.04	.01	.10	−.20*	−.19*	−.04	−.19*	−.21*	.43**	.07	–	.10
14. Positive discipline[b]	.05	−.28**	.00	−.02	−.02	−.07	−.07	−.10	−.02	−.05	.07	.29**	.09	–
Primiparas														

[a] Child age at posttest in months

[b] Standardized values

* $P < .05$. ** $P < .01$

time as within-subjects factor. Because of the conceptual and statistical associations with externalizing behaviors, we entered child temperament as covariate. In addition to the significant interactions of experimental condition by time by marital discord as well as by daily hassles previously reported by van Zeijl et al. (2006a), we found a significant interaction of experimental condition by time by satisfaction with support, F (3, 227) = 2.72, $P < .05$, partial $\eta^2 = .04$. Univariate tests showed that the intervention was especially effective in decreasing overactive child behavior when mothers reported more dissatisfaction with support, F (1, 229) = 4.17, $P < .05$, partial $\eta^2 = .02$ (see Fig. 2). The intervention was also effective in decreasing oppositional child behavior in families with mothers reporting more dissatisfaction with support, F (1, 229) = 46.03, $P < .05$, partial $\eta^2 = .03$ (see Fig. 3). The direction of the effects was similar to that reported by van Zeijl et al. (2006a) for marital discord and daily hassles: more problems were related to increased effectiveness. Treatment effectiveness was not related to child sex, age, and temperament, maternal physical health, educational level, and psychopathology.

Whether *cumulative risk* affected changes in parenting (sensitivity and positive discipline) and child behaviors (overactive, oppositional, aggressive) was tested by

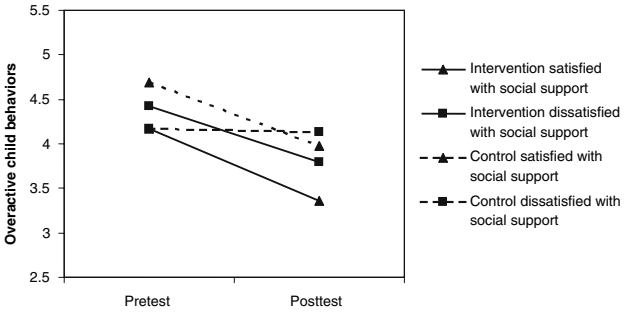

Fig. 2 Intervention effect on overactive child behaviors for high and low levels of dissatisfaction with support

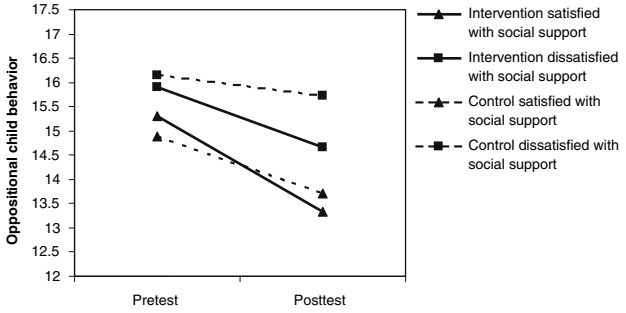

Fig. 3 Intervention effect on oppositional child behaviors for high and low levels of dissatisfaction with support

a repeated measures MANOVA with experimental condition and cumulative risk (median split) as between-subjects factor and time as within-subjects factor. There was no significant effect for the experimental condition by time by cumulative risk interaction for parenting, F (2, 232) = 0.18, P = .84, or for child behaviors, F (3, 227) = 0.51, P = .68.

Parity and Intervention Effects

Repeated measures MANOVAs with experimental condition as between-subjects factor and time as within-subjects factor were performed, separately for primiparas and for multiparas to assess intervention effects on *parenting*: maternal sensitivity and positive discipline. The interaction effect for experimental condition by time for *primiparas* was not significant, F (2, 127) = 2.82, P = .06, partial η^2 = .04. In contrast, a significant interaction effect was found for experimental condition by time for *multiparas*, F (2, 104) = 5.30, P < .01, partial η^2 = .09. Univariate tests showed that multiparous intervention mothers displayed a stable use of sensitivity over time compared to an increase in the use of sensitivity over time for multiparous control group mothers (F (1, 105) = 4.85, P < .05, partial η^2 = .04), indicating an iatrogenic effect (see Fig. 4). For both primiparas and multiparas, treatment effectiveness on parenting was unrelated to child sex, age, and temperament, as well as to the level of hassles, marital discord, dissatisfaction with social support, physical health problems, psychopathology, and maternal education. In addition, in both groups treatment effectiveness was unrelated to level of cumulative risk.

To test whether the intervention affected *child behaviors* (overactive, oppositional, and aggressive behaviors), repeated measures MANCOVA were conducted, with experimental condition as between-subjects factor and time as within-subjects factor. Child temperament was entered as covariate, because of the conceptual and statistical associations with externalizing behaviors. There was no interaction effect between experimental condition and time for *primiparas* (F (3, 125) = 2.12, P = .10), nor for *multiparas* (F (3, 1020) = 0.32, P = .81). However, for *primiparas* the interaction of experimental condition by time by satisfaction with social support was significant, F (3, 120) = 4.51, P < .01, partial η^2 = .10. Univariate tests showed that especially in families with mothers reporting high levels of dissatisfaction with

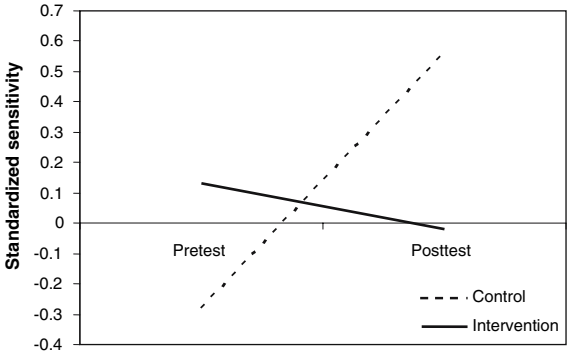

Fig. 4 Intervention effect on observed maternal sensitivity in multiparas

social support, the intervention was effective in decreasing overactive and oppositional child behaviors: overactive, F (1, 122) = 6.72, $P < .05$, partial $\eta^2 = .05$ (see Fig. 5), oppositional, F (1, 122) = 9.05, $P < .01$, partial $\eta^2 = .07$ (see Fig. 6). In contrast, for aggressive child behaviors, univariate tests showed a significant effect in the other direction F (1, 122) = 4.91, $P < .05$, partial $\eta^2 = .04$ (see Fig. 7). In families with mothers reporting more dissatisfaction with support, the level of child aggression was stable for the intervention group and decreased in the control group. For *multiparas* the interaction of experimental condition by time by daily hassles was significant, F (3, 97) = 2.77, $P < .05$, partial $\eta^2 = .08$. Univariate tests showed that in the context of high maternal daily hassles, the intervention was effective in decreasing overactive child behaviors, F (1, 99) = 8.16, $P < .01$, partial $\eta^2 = .08$ (see Fig. 8). For both primiparas and multiparas treatment effectiveness on child behavior was unrelated to child sex, age, temperament, the level of marital discord, physical health problems, psychopathology, and maternal education, as well as for primiparas to daily hassles, and for multiparas to dissatisfaction with support. Finally, in both parity groups treatment effectiveness was unrelated to level of *cumulative risk*.

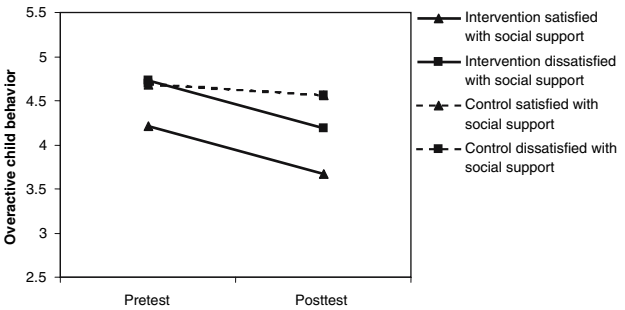

Fig. 5 Intervention effect on overactive child behaviors for high and low levels of dissatisfaction with support in primiparas

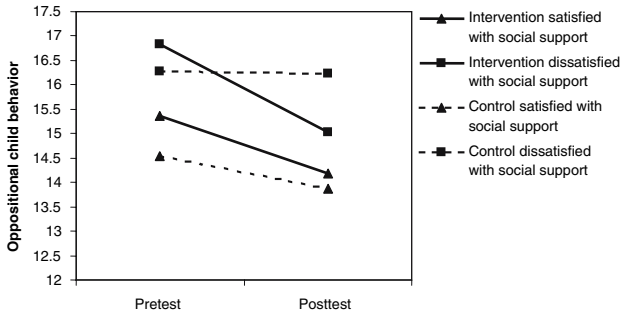

Fig. 6 Intervention effect on oppositional child behaviors for high and low levels of dissatisfaction with support in primiparas

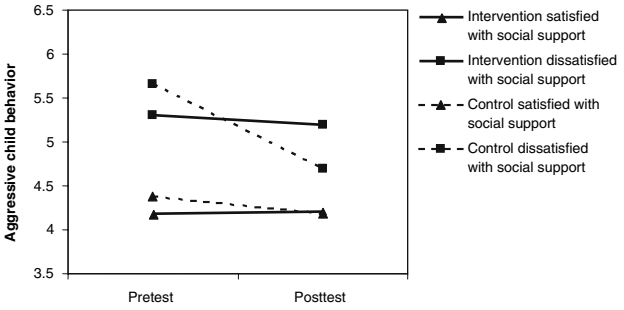

Fig. 7 Intervention effect on aggressive child behaviors for high and low levels of dissatisfaction with support in primiparas

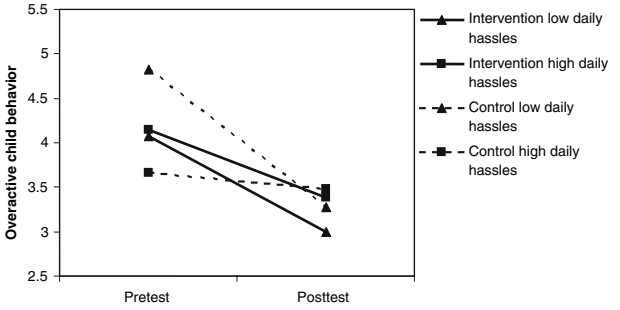

Fig. 8 Intervention effect on overactive child behaviors for high and low levels of daily hassles in multiparas

Discussion

This study investigated moderating effects of cumulative risk and parity on intervention effectiveness for child externalizing behaviors and parenting. The intervention resulted in a decrease of overactive behaviors in children of mothers reporting higher levels of marital discord, daily hassles, or dissatisfaction with social support. Furthermore, it resulted in a decrease of oppositional behaviors in children of mothers reporting dissatisfaction with support. The level of cumulative risk did not moderate intervention effectiveness. Analyses concerning parity showed an iatrogenic effect among multiparas: control group mothers showed an increase in sensitivity, whereas the intervention group showed a constant level of sensitivity over time. Further, in primiparas the intervention resulted in a decrease of overactive and oppositional, but not of aggressive behaviors, in children of families dissatisfied with social support. Finally, in multiparas with high levels of daily hassles the intervention decreased overactive child behaviors. These results suggest that parity may be a moderator of intervention effectiveness.

Intervention effects on overactive child behaviors depended on level of marital discord, daily hassles, or dissatisfaction with social support. Changes in oppositional

child behaviors appeared to depend on the level of dissatisfaction with support. As hypothesized, the majority of our findings showed that the intervention was most effective in families with greater need for support.

Of the family context characteristics examined in this study, marital discord and daily hassles may be most proximally related to parenting practices. If parents frequently argue about the children and mutual support regarding parenting is lacking, mothers may be more open for tips and advice from an intervener. In addition, mothers experiencing high levels of daily hassles may need only to be reminded of how to interact with the children. The hassles may have been too impeding, with a decrease in positive parenting as a result. Similarly, families who were dissatisfied with social support may have been more motivated to make changes, because the intervener offered the desired support through the intervention. Discussing parenting and child behaviors may have elicited a sense of social support for the mothers. However, we found no associations of family characteristics with parenting, only with child behaviors. More extensive research is needed to understand how family characteristics affect parenting, and how parenting changes by means of an intervention.

The fact that overactive behaviors were particularly affected, may have been due to the less severe nature of these behaviors, compared to the more disruptive oppositional or aggressive behaviors. As van Zeijl et al. (2006a) suggested, the limited number of six intervention sessions may be less successful in decreasing these more disruptive behaviors, or that effects on these behaviors may occur later in the child's development. Although we found no effects on parenting and the mechanism through which child behaviors changed remain unclear, mothers of children with externalizing behaviors apparently do profit from intervention efforts, teaching them to respond appropriately, sensitively, and consistently to child behaviors. Our measures may not have been sensitive enough or not sufficiently broad to measure change in parenting.

Cumulative risk has been most often related to child outcomes, such as intelligence or externalizing problems (e.g., Atzaba-Poria et al. 2004), with equivocal results. While some studies suggest that more risk is positively related to intervention effectiveness, but negatively in poor families (e.g., Berlin et al. 1998), others suggest no such associations at all (Nair et al. 2003). In addition, there is limited research available relating cumulative risk in early childhood to *parental* intervention response, in particular concerning the moderating influence of contextual risk on intervention effectiveness (Reyno and McGrath 2006). Based on previous studies, we expected cumulative risk to be associated with post-intervention change in child externalizing behavior, parental sensitivity, and discipline (more risk may imply more to gain). However, this appeared not to be the case. In our study, intervention response was not moderated by the presence of cumulative contextual family risk. Our results are in line with studies of Berlin et al. (1998) and Liaw and Brooks-Gunn (1994), who also found that in non-poor families intervention effects were equal in families with few or many risk factors.

In addition, even though the cumulative risk factor was negatively correlated with parental sensitivity and discipline, these correlations were not higher than the correlations between parenting and some of the single risk factors, such as marital

discord and psychopathology (Stolk et al. 2007). One explanation for these findings could be the relatively low levels of the various risk factors in our sample. Our non-clinical sample screened for behavior problems concerned a relatively highly educated group of mothers, whereas the majority of intervention studies on risk and multiple risks have been conducted among high-risk, poor, or low-SES families, often associated with low education (e.g., Liaw and Brooks-Gunn 1994). Cumulative risk may have a different effect on changes in parenting in clinical samples and samples from low socioeconomic backgrounds. Berlin and colleagues (1998), for example, showed that in non-poor families cumulative risk was positively associated with effectiveness, whereas in poor families this association was reversed. The effectiveness of our behaviorally focused intervention may have been independent of multiple risks because the intervention efforts were not diluted across too many domains of family functioning, as was the case in most previous studies. In multi-risk families, interveners may be inclined to emphasize support of parents' daily functioning (insurance, job, housing) and they may never reach the point at which the focus is exclusively on change of concrete interactive behaviors (van IJzendoorn et al. 2005)

The limited research on differential intervention effectiveness for primiparas as compared to multiparas combined with recent efforts to identify moderators of intervention outcome (Beauchaine et al. 2005) brought us to examine first-time parenting as a moderator of changes in parenting as a result of an early childhood intervention program. Testing whether interventions are more beneficial for first-time parents is important for selection and prevention efforts. We expected that first-time parents would benefit more from the intervention than experienced parents because it may be easier to develop new parenting behaviors than to change rigid old ones. Our results only partly confirmed this hypothesis.

First, we found a significant effect for multiparas on parenting: the intervention group showed stable sensitivity over time, whereas the control group showed an increase in sensitivity. These results were not found for primiparas. Why the control group of experienced parents in our study showed this increase, remains unclear. This appears to be an iatrogenic (unexpected negative) effect of the intervention (see e.g., Poulin et al. 2001), although it must be noted that our intervention group did not decrease in sensitivity. It could be argued that without intervention the multiparas in the intervention group might also have become more sensitive, similar to the control group. Iatrogenic effects are rarely reported in the literature. There is a possibility that more studies have found similar effects, but did not report them, resulting in the so called 'file drawer problem' (Rosenthal 1979). Further, two home-based intervention studies aimed at promoting parental sensitivity also reported a negative intervention effect. In Zahr (2000), parental sensitivity in the intervention group decreased substantially compared to the control group. In a quasi-experimental and cross-sectional study, Belsky et al. (2006) found that the intervention negatively affected the most disadvantaged families (teen mothers, single parents, poor families). This subgroup decreased in positive parenting and child social functioning, as compared to disadvantaged families with greater personal resources, who showed increases in positive parenting and child social functioning. The authors suggest that the most disadvantaged families may have

experienced the home visits as stressful or intrusive. Perhaps this also occurred in our study. The home visits may have been somewhat stressful for families with more than one child, disturbing the balance of their acquired parenting skills. Although it remains unclear why this effect appeared, our results warrant further investigations of identifying subgroups that profit most of interventions as well as subgroups that may need different approaches.

Second, we found that especially for primiparous mothers experiencing higher levels of dissatisfaction with support, the intervention was effective in decreasing overactive and oppositional child behaviors, but not aggressive child behaviors. These effects were absent in multiparas. An explanation may be that primiparous mothers experience parenting and parenting difficulties for the first time. When an intervener comes into their homes to discuss child behaviors, this may be sufficiently supporting them and encourage them to change the interaction with their children. Conversely, multiparas, who may already have more rigid parenting behaviors, may have expected more from the interveners or needed more home visits to accomplish the same results. On the other hand, we found a decrease in overactive child behaviors as a result of the intervention for multiparas experiencing high levels of daily hassles. These mothers may have normally been capable of showing positive parenting, but daily hassles may have interfered with their parenting practices. The intervention therefore may have been enough to remind them of positive ways to interact with their children. This may be particularly true for multiparous mothers. With more children to take care of, the pressure of daily hassles may affect parenting more easily than when parenting is aimed at one child. In families with primiparas reporting more dissatisfaction with support, the level of child aggression was stable for the intervention group but decreased in the control group. Again, the intervention seems to be counterproductive in a subgroup of parents who might have shown the control group decrease in aggression without the intervention. It is unclear what factors may be responsible for this unexpected outcome. It reminds us of the existence of iatrogenic effects even with the best of salutogenic intentions. The outcome may also represent a statistical artifact and replication is badly needed to know whether this negative effect indeed is a real finding to be explained in theoretical or substantive ways.

Some of the results suggest that primiparas are indeed more open to change, with effects on two types of externalizing child behaviors (overactive and oppositional), but they indicate that multiparas who experience high levels of daily hassles benefit as well. Our study was explorative in investigating the moderating effects of parity. Little is known yet regarding whether and how parenting changes after the birth of a second child (Scott and Hill 2001). The limited available information suggests that parenting does change, with a decrease in positive parenting toward later-borns (e.g., Dunn et al. 1986; Teti et al. 1996; van IJzendoorn et al. 2000). In our study, sex, age, and temperament did not affect intervention effectiveness in primiparas, nor in multiparas. Future research may provide more insight in the processes behind this moderating effect, which may facilitate screening and prevention efforts to support families with children showing externalizing behaviors.

The first limitation of our study is the low response rate in both the screening and intervention sample. For the screening phase this may have been due to the rather

long screening questionnaire, including many questions about a variety of topics. Further, parents who were invited for the intervention study may have been unwilling to commit to a full year of participation. However, the response and non-response group of selected families only differed on educational level of both parents, with higher education for participating families. No differences were found for other demographic variables or for levels of child externalizing problems. Second, even though in our sample the mother was always the primary caregiver, including reports and observations from fathers may be useful in gaining full understanding of the associations between the family context and the effectiveness of an intervention program. For instance, in families with low marital adjustment, mothers and fathers tend to interact differently with their children (Crockenberg and Langrock 2001). Third, in our study we did not include siblings of the target children. Because several studies suggested that siblings may also benefit from intervention efforts (e.g., Brotman et al. 2005; Seitz and Apfel 1994), including siblings may provide more insight in possible diffusion effects to other family members.

Several directions for future research can be formulated. First, we underscore the need for further specification of variables predicting differential intervention response that has been noted before (Brestan and Eyberg 1998; McDonald-Culp et al. 2004). Although recently Beauchaine and colleagues (2005) and van Zeijl et al. (2006a) identified a number of moderating family and context characteristics (including marital discord and daily hassles), much remains to be learned about differential susceptibility of families for parenting intervention programs. Further, a particularly salient aspect for future investigation is the accumulation of family or contextual risk. While most parenting intervention studies investigate intervention effects on child outcomes, additional research needs to shed light on intervention effects on parenting, since these may mediate child outcomes (Cowan 1997; Egeland et al. 2000; Heinicke et al. 1988).

Conclusion

We explored moderators of intervention effectiveness of an intervention aimed at enhancing sensitivity and adequate discipline strategies for mothers of young children with high levels of externalizing behaviors. Our study demonstrated that whether a mother is raising a first-born or later-born child was associated with intervention response. The intervention appeared especially effective in decreasing externalizing child behaviors in the context of stressful family circumstances. The study suggests that parity may be a moderator of intervention effectiveness, in particular in families experiencing higher levels of daily hassles or dissatisfaction with support. Cumulative risk did not affect intervention response in first-time versus experienced parents. It should be noted that we also found some counterproductive effects of the intervention in specific subgroups and for specific outcome measures, which may point to possible iatrogenic side-effects of our intervention approach. This is a neglected but important area for further exploration in parenting intervention studies. Future research should provide more insight into

the processes that underlie differences in intervention effectiveness, and in that way may define more specifically the road to successful screening and prevention.

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