

Attachment-Based Intervention for Enhancing Sensitive Discipline in Mothers of 1- to 3-Year-Old Children at Risk for Externalizing Behavior Problems: A Randomized Controlled Trial

Jantien Van Zeijl, Judi Mesman,
Marinus H. Van IJzendoorn,
Marian J. Bakermans-Kranenburg, Femmie Juffer,
and Mirjam N. Stolk
Leiden University

Hans M. Koot
Vrije Universiteit Amsterdam

Lenneke R. A. Alink
Leiden University

The home-based intervention program Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) was tested in a randomized controlled trial with 237 families screened for their 1- to 3-year-old children's relatively high scores on externalizing behavior. VIPP-SD, based on attachment theory and coercion theory, focuses on mirroring and discussing actual parent-child interactions in six 1.5-hr sessions with individual families at home. VIPP-SD proved to be effective in enhancing maternal attitudes toward sensitivity and sensitive discipline and in promoting sensitive discipline interactions in the intervention group as compared with the control group. Moreover, in families with more marital discord and in families with more daily hassles, the intervention resulted in a decrease of overactive problem behaviors in the children. The authors conclude that VIPP-SD should become an important module in attachment-based interventions.

Keywords: attachment, intervention, sensitivity, discipline, externalizing problems

Supplemental data: <http://dx.doi.org/10.1037/0022-006X.74.6.994.supp>

One of the most compelling research themes regarding the development of externalizing problems (overactive, oppositional, and aggressive behavior) is the role of early maladaptive parent-child interaction patterns (Burke, Loeber, & Birmaher, 2002; Hinshaw, 2002). Externalizing problems in preschoolers are predictive of a variety of problems in later childhood (Campbell & Ewing, 1990; Mesman & Koot, 2001), and even in 1-year-old children, externalizing problems show (at least) short-term stability (Van

Zeijl et al., 2006). However, little is known about the role played by parents in the origin of the externalizing problems of these young children or about the possibilities for prevention in the first few years of life, which emphasizes the importance of investigating the influence of early childhood parenting. To date, research into the contribution of maladaptive parent-child interactions to the development of externalizing problems in early childhood has been inspired by two main theoretical frameworks: attachment theory and coercion theory.

According to attachment theory, infants are biologically predisposed to use their parent as a haven of safety to provide comfort and protection when they are distressed and as a secure base from which they can explore the environment (Bowlby, 1969). Attachment theory focuses on the quality of early parental care, in terms of sensitivity and responsiveness, as an important contributor to salient socialization processes in the first years of life (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969). Whereas secure child-parent attachment relationships in infancy predict positive outcomes in later life (e.g., Fagot, 1997; Sroufe, Egeland, Carlson, & Collins, 2005), an insecure attachment relationship is predictive of less optimal child development (Greenberg, 1999). A number of longitudinal studies have shown that attachment insecurity and parental lack of warmth in early childhood are associated with externalizing problems in later childhood and adolescence (e.g., Belsky, Woodworth, & Crnic, 1996; Greenberg, Speltz, DeKlyen, & Endriga, 1991; Olson, Bates, Sandy, & Lanthier, 2000). Several

Jantien Van Zeijl, Judi Mesman, Marinus H. Van IJzendoorn, Marian J. Bakermans-Kranenburg, Femmie Juffer, Mirjam N. Stolk, and Lenneke R. A. Alink, Centre for Child and Family Studies, Leiden University, Leiden, the Netherlands; Hans M. Koot, Department of Developmental Psychology, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands.

This study is part of the research project Screening and Intervention of Problem Behavior in Toddlerhood (SCRIPT), conducted at the Centre for Child and Family Studies, Leiden University. The study was supported by Zorg Onderzoek Nederland (Netherlands Organization for Health Research and Development) Grant 2200.0097 to Marinus H. Van IJzendoorn and Femmie Juffer. We thank all parents and children who participated in our study as well as all students who assisted in various phases of the SCRIPT project.

Correspondence concerning this article should be addressed to Marinus H. Van IJzendoorn, Centre for Child and Family Studies, Leiden University, P.O. Box 9500, 2300 RB, Leiden, the Netherlands. E-mail: vanijzen@fsw.leidenuniv.nl

mechanisms underlying the association between early parental care and the development of externalizing problems have been proposed (DeKlyen & Speltz, 2001; Greenberg, 1999), including the formation of negative social expectations, a lack of motivation to internalize rules, poor self-regulation skills, and negative attention seeking on the part of the child.

Coercion theory is based on the social learning perspective and focuses on ineffective parental discipline (Patterson, 1976, 1982; Snyder, 1995). In particular, coercion theory states that child externalizing problems are more likely to emerge when a child is reinforced for responding with negative behavior to parental requests or demands. The child is trying to coerce the parent into terminating the undesired request, and the parent's repeated attempts to obtain child compliance are met with increasingly difficult behavior. If this process ultimately leads to the withdrawal of the parent's request, the child's aversive behaviors are negatively reinforced (i.e., rewarded by termination of the undesirable stimulus). Related processes include inconsistent parental discipline and a failure to provide positive reinforcement for compliant and prosocial child behaviors. Several studies have shown that negative reinforcement processes are relevant to the development of externalizing problems in school-aged children (e.g., Patterson, 1982; Prinzie et al., 2003).

Despite their differences, attachment theory and coercion theory show agreement regarding the conceptualization of early parent-child interactions. Both emphasize the importance of nonaversive interactions and contingencies in the socialization process, and both describe a transactional developmental process, focusing on the appropriateness of parents' responses to children's behaviors (Ainsworth, Bell, & Stayton, 1974; Patterson, 1982; Rothbaum & Weisz, 1994).

Salient parenting issues during early childhood center around sensitive responsiveness and parental discipline practices (Sroufe, 1979; Sroufe et al., 2005). From a developmental perspective, parental discipline strategies become increasingly important for managing child behavior during the toddler years (e.g., Belsky et al., 1996). By the end of the 1st year, parenting issues shift from primarily providing nurturance and protection to, for example, providing firm support, setting limits, and using effective control strategies (Sroufe, 1979; Sroufe et al., 2005). Children experience rapid developmental advances in cognitive, language, and motor skills, which, in combination with a growing need for autonomy and increased striving for independence, underlie the characteristically challenging and disruptive behaviors of preschoolers (Campbell, 2002). In a previous study (Van Zeijl et al., 2006), we found that externalizing problems had already started to emerge around the children's 1st birthday and were rather stable across the first few years of life (see also Alink et al., 2006). Although in most children externalizing behaviors decline from school entry onward (Achenbach & Rescorla, 2000), not all children overcome their behavioral difficulties. Without intervention, early externalizing problems can develop into severe clinical problems and become a lifelong concern (Kendziora, 2004). Whereas the issue of sensitive responsiveness is extensively addressed in attachment theory, the importance of effective discipline strategies is explicitly discussed in coercion theory. Therefore, the combined theoretical frameworks of attachment theory and coercion theory provide the leads for an optimal approach to the development of early

childhood intervention programs focusing on externalizing child behaviors.

Attachment-Based Interventions

The favorable child outcomes of secure attachment relationships and the hypothesis that early interventions may be most effective in preventing less optimal or deviant developmental pathways in children have led to the development of many early preventive interventions focusing on positive parenting (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005a). Usually, these attachment-based intervention programs are aimed at enhancing parental sensitivity, which refers to the ability to accurately perceive children's attachment signals and to respond to these signals in an adequate and prompt way (Ainsworth et al., 1974). In a meta-analysis including 70 studies representing 88 intervention effects on parental sensitivity and/or children's attachment security, interventions that specifically focused on promoting sensitive parental behavior proved to be effective in changing insensitive parenting as well as infant attachment insecurity (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003).

On the basis of this meta-analytic evidence, we developed a short-term, behaviorally focused intervention program: Video-feedback Intervention to promote Positive Parenting (VIPP; Juffer, Bakermans-Kranenburg, & Van IJzendoorn, in press). In the VIPP program, parent and child are videotaped during daily situations at home. Video feedback provides the opportunity to focus the mother's attention on her child's videotaped signals and expressions, thereby stimulating her observational skills and empathy for her own child. It also enables positive reinforcement of the parent's moments of sensitive behavior shown on the videotape, thus addressing both parts of Ainsworth et al.'s (1974) definition of sensitivity: (a) accurately perceiving the child's signals, and (b) adequately responding to them. Studies using the VIPP approach showed positive effects on parental sensitivity and/or attachment security in nonclinical groups—for example, in adoptive families (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005b)—and in at-risk and clinical groups, such as mothers with an insecure representation of attachment (Klein Velderman, Bakermans-Kranenburg, Juffer, & Van IJzendoorn, 2006) and mothers with eating disorders and their infants (Stein et al., 2006).

However, attachment-based interventions lack a clear-cut focus on parental discipline, whereas at least some children may need firm control and limit setting as much as parental sensitivity. The traditional emphasis of attachment theory on parental sensitivity is derived from research on infants (Ainsworth et al., 1978), but parents also need to manage their older children's exploration of behavioral limits (Patterson, 1982). To specifically target children at risk for the development of externalizing problems, we therefore recently extended the VIPP approach, with the objective to focus not only on parental sensitivity but also on parental discipline practices. This resulted in the intervention program Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD). The VIPP-SD program aims at enhancing parental sensitivity as well as sensitive discipline, that is, parents' ability to take into account the child's perspective and signals—the essential part of parental sensitivity—when discipline is required. Sensitive discipline includes the adoption of more adequate and child-oriented discipline methods, such as induction (Hoffman,

1984) and empathy for the child when he or she is frustrated or angry (Lieberman, 2004).

Differential Effectiveness

One of the intervention studies using VIPP showed a differential treatment effect depending on children's temperamental reactivity (e.g., easily upset). Maternal sensitivity and attachment security were significantly more enhanced in families with highly reactive children than in families with less reactive children (Klein Velderman et al., 2006). These outcomes support Belsky's (1997a, 1997b, 2005) hypothesis of differential susceptibility, namely that children vary in their susceptibility to parental rearing because of their temperament. Therefore, in the present study we examine whether child temperament moderates the effectiveness of our intervention on either parenting or child outcomes. In addition, we investigate the effect of child age on intervention outcomes. We expect more intervention effectiveness in younger children, as successful treatment is supposed to become increasingly difficult when transactional interaction patterns have become more rigid. Finally, adverse family circumstances may lead to more intervention effects, because these families are in greatest need of support (e.g., Beauchaine, Webster-Stratton, & Reid, 2005). Therefore, we also examine the influences of marital discord, daily hassles, and lack of maternal well-being on intervention effectiveness.

Hypotheses

In the current study, we test the intervention program VIPP-SD in a large sample of families screened for their children's relatively high scores on externalizing behavior in a randomized trial. We test the following hypotheses: First, we expect the intervention to affect maternal attitudes, resulting in greater acceptance of a sensitive parenting style and sensitive discipline strategies. Second, we expect the intervention to be effective in enhancing the mother's sensitivity and sensitive discipline in relevant daily activities (e.g., during play or a prohibition situation). Third, we expect the intervention to decrease the children's externalizing problem behaviors, in particular those behaviors that are most common and less severe (i.e., oppositional and overactive behaviors; see Van Zeijl et al., 2006), as the current intervention is of modest duration and intensity. Fourth, we expect intervention effects on the children's problem behaviors to be mediated by intervention effects on parenting attitudes and behaviors. Fifth, we test the influence of child and family characteristics on the effectiveness of the intervention. We expect the intervention to be most effective in younger children and in children with a difficult temperament, as compared with relatively easy children. Finally, we expect families in greatest need of support because of their family circumstances (marital discord, daily hassles, and low maternal well-being) to profit most from our intervention.

Method

The Screening and Intervention of Problem Behavior in Toddlerhood (SCRIPT) Study

The Dutch SCRIPT study 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- to 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 relatively high levels of externalizing behavior problems. The study was conducted in compliance with the Leiden University Medical Center Internal Review Board.

Sample Selection

Participants were recruited from community records of several cities and towns in the western region of the Netherlands. Children born in a specific time period were selected between May 2001 and December 2002 to obtain a group of 1-, 2-, and 3-year-old children. 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 and language difficulties in home visits). Therefore, children who had both a non-Dutch surname and a non-Dutch first name were not included in the target screening sample. Parents of 4,615 eligible children were sent questionnaire booklets by mail. We obtained 2,408 questionnaires from primary caregivers (response rate = 52%). Unfortunately, we were not able to collect detailed information on nonparticipating families, but there were no child age or child sex differences between responding and nonresponding families (respectively, $p = .11$ and $p = .38$).

To ensure a homogeneous sample, we included in the intervention study only children living with two parents (with the biological mother as the primary caregiver and a father figure—biological or stepfather—as the second caregiver; 95% of the screening sample). This selection and the application of 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. At the time of our data collection, there were no established clinical cutoff scores for the Dutch Child Behavior Checklist for Ages 1.5–5 (CBCL/1.5–5; Achenbach & Rescorla, 2000) and no existing normative data regarding 1-year-old children. Because the early VIPP-SD intervention targets children who are suffering from externalizing behavior problems or are at risk for the development of such problems, children with scores above the 75th percentile on the CBCL/1.5–5 Externalizing Problems scale (age 1 year: scores ≥ 13 ; age 2 years: scores ≥ 19 ; age 3 years: scores ≥ 20) were selected for the intervention study. Parents of children who met these criteria were asked to participate in a study on difficult child behavior and on how parents deal with this behavior when receiving different types of support.

Of the 438 selected families, parents of 246 children (56%) agreed to participate in the intervention study. All mothers signed an informed consent form. During the intervention phase, 9 families withdrew from the study, either directly after the pretest and before randomization took place (4 families) or before the posttest (1 intervention group family and 4 control group families). The final intervention study sample consisted of 237 children and their mothers. Fifty-six percent of the children were boys, and over half of the children had siblings (59%). Mean age of the mothers was 33 years, 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). There were no significant differences between selected families who agreed to participate in the entire intervention phase and those who declined regarding initial level of child externalizing problems ($p = .99$), child and maternal age ($p = .18$ and $p = .07$, respectively), child sex ($p = .84$), and presence of siblings ($p = .98$). The only statistically significant difference was that participating parents had a somewhat higher educational level than nonparticipating parents, $F(1, 434) = 12.70$, $p < .01$.

We targeted children with relatively high levels of behavior problems and parents facing relatively high levels of stress. Families in the final intervention sample were indeed significantly different from the other

Table 1
Group Differences for Screening Versus Intervention Sample

Variable	Initial screening sample (<i>n</i> = 2,032 ^a)		Final intervention sample (<i>n</i> = 237)		Group differences	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>
Child difficult temperament	1.35	0.52	1.89	0.52	-14.85**	2261
Child externalizing behavior						
Overactive	2.17	1.80	4.10	1.66	-16.82**	2267
Oppositional	6.77	5.33	14.95	5.07	-22.46**	2267
Aggressive	2.21	2.19	4.88	2.66	-14.86**	2267
Family background						
Parental educational level	3.93	1.05	3.92	1.07	0.11	2259
Maternal age	33.71	4.26	33.15	4.22	1.91	2266
No. siblings	0.81	0.81	0.76	0.77	0.88	2264
Daily hassles	13.48	9.98	20.47	12.70	-8.18**	2253
Marital discord	1.37	1.56	2.13	1.84	-6.09**	2163
Maternal well-being	7.30	1.48	6.74	1.54	5.44**	2154

^a Because of missing data, *n*_{screening sample} ranged from 1,927 to 2,032; *n*_{intervention sample} ranged from 229 to 237.
** *p* < .01.

families in the initial screening sample regarding child difficult temperament, marital discord, daily hassles, and—of course—child externalizing problems (see Table 1); all showed higher levels in the intervention sample than in the screening sample. Maternal well-being was lower in the intervention sample than in the screening sample. Parental educational level, maternal age, and number of siblings were similar in both groups, as was child sex (*p* = .17). Thus, the families in the current intervention study were from similar backgrounds as the other families screened for their children's externalizing behaviors, but they struggled with more problematic child behavior as well as a more stressful family life in general.

Procedure

Participating families were invited for a pretest in the laboratory. The mean time between the screening and the pretest was 3.85 months (*SD* = 0.96; 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 1.5-hr laboratory session, mother and child completed several tasks (coded afterward from videotapes with observational measures by independent coders who were unaware of experimental condition and other data concerning the participants), and mothers were asked to fill in some questionnaires.

After the pretest, a computer-generated list randomly assigned families, stratified for age group, to either the control group (*n* = 117) or the intervention group (*n* = 120). There were no differences between groups regarding initial level of child externalizing problems (*p* = .13), parental educational level (*p* = .46), child and maternal age (*p* = .85 and *p* = .97, respectively), or presence of siblings (*p* = .67). The only statistically significant difference was the percentage of girls, which was higher in the intervention group (51%) as compared with the control group (38%), $\chi^2(1, N = 237) = 4.20, p < .05$. Families in the intervention group received six home visits, 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 the control group visited the laboratory for the posttest, which used the same procedures as the pretest. Mean age of the 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 families' home 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. Treatment fidelity checks (concerning adherence and competence of the interveners) were performed on each of the six intervention sessions in approximately 10% of the participating families and showed that in all of these cases the intervention was delivered as intended. Three of the interveners had a university degree in education and child studies or in psychology; the other seven interveners were psychology master's students. The duration of each home visit was approximately 1.5 hr. The first four intervention sessions took place every month; the last two sessions took place every other month. Program attendance was high: All participants received six home visits and completed all steps planned in the VIPP-SD protocol.

The SCRIPT study applied the video-feedback method known as VIPP-SD, aimed at parental sensitivity and sensitive parental discipline. To ensure that all families received the same standardized program, we used a detailed manual describing the structure, themes, tips, and exercises for mother and child for each home visit (Juffer et al., in press; see also Mesman et al., in press, for a full description of the VIPP-SD intervention sessions). Each intervention session started with videotaping standardized mother–child interactions (e.g., reading a book together) to prevent filming mother–child interaction immediately after giving the video feedback. In between home visits, the interveners selected specific video fragments and prepared comments based on the themes of each specific intervention session (see below). After collecting video material to be used in the next home visit, the intervener gave feedback on the video fragments of the previous session and provided information and tips with respect to the general themes of sensitivity and discipline. Feedback on themes of previous intervention sessions was always integrated into every new session.

The first four intervention sessions each had their own themes. Session 1 focused on exploration versus attachment, teaching parents to recognize and acknowledge the differences between exploratory behavior and contact seeking (sensitivity), and addressed the importance of distraction and induction as noncoercive responses to difficult child behavior or potentially conflict-evoking situations (discipline). The second session centered around speaking for the child (Carter, Osofsky, & Hann, 1991) to draw the mother's attention to the child's (subtle) signals and expressions (sensitivity) and around teaching parents to use positive reinforcement by praising the child for positive behavior and ignoring negative attention seeking (discipline). In the third session, the intervener stressed the importance of

adequate and prompt responses to the child's signals by showing interaction chains consisting of three components: the child's signal, the mother's sensitive response, and the child's positive reaction to that response (sensitivity). The third session's discipline theme concerned the use of a sensitive time-out to deescalate temper tantrums. The importance of sharing—both positive and negative—emotions (sensitivity) and promoting empathy for the child, in particular while using consistent and adequate discipline strategies and clear limit setting (discipline), was the central theme of Session 4. The following two sessions, Sessions 5 and 6, were aimed at consolidating intervention effects by integrating—in video feedback and discussion—all tips and feedback given in the previous sessions. During these booster sessions, fathers were invited to participate along with the mothers (all other intervention sessions took place in the presence of only the mother, child, and intervener), as their involvement might enhance intervention effects through their support to implement the newly acquired skills (Bakermans-Kranenburg et al., 2003; see also Stolk et al., in press).

The VIPP-SD intervention trajectory can be divided into three steps: (a) getting acquainted with the mother and building a relationship, with an emphasis in the video feedback on child behavior (Sessions 1 and 2); (b) actively working on improving parenting behaviors by showing the mother at what moments her parenting strategies work and to what other situations she could apply these strategies (Sessions 3 and 4); and (c) using booster sessions to review all feedback and information from the previous intervention sessions (Sessions 5 and 6). Interveners reinforced positive mother-child interactions and effective parenting strategies in a pleasant atmosphere, and the mothers were explicitly involved as the experts on their own child. Although the structure and content of every intervention session were the same for all families, the video feedback was adjusted to the specific mother-child dyads, depending on their particular needs and the nature of the videotaped interactions. At the end of the program, the mothers received a brochure with information on the key issues discussed during the home visits, including the tips and exercises.

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 groups and to prevent selective attrition (Juffer et al., 2005a). In the six telephone calls, mothers were invited to talk about the general development of their child (e.g., eating, sleeping, playing) in a semistructured interview format. 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, it was suggested that they consult their general practitioner or well-baby clinic.

Instruments

Internal consistencies of questionnaire data were assessed in the general population screening sample ($n = 2,408$).

Daily hassles. In the screening phase, the mothers were asked to rate 25 indexes of potentially stressful events (Kanner, Coyne, Schaffer, & Lazarus, 1981). They rated the intensity of hassles they experienced on a 5-point scale for each event (0 = *no hassle* to 4 = *big hassle*). Items asked about daily hassles related to life in general (e.g., money problems or trouble at work). Reliability and validity of this scale were shown by Kanner et al. (1981). We computed a total score by summing all item scores; Cronbach's alpha was .87. For the current study, we used a median split to test for differential treatment effects.

Marital discord. 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 true (0 = *not true*, 2 = *true or often true*). Reliability and validity of this scale were demonstrated by Koot (1997). The internal consistency (Cronbach's alpha) was .66. We computed a total score by summing item scores. To test for differential treatment effects for families with high versus low levels of marital discord, we used a median split.

Well-being. In the screening phase, the mothers rated their sense of well-being on the Cantrill Ladder (Cantrill, 1965), indicating how they had felt in the past month. This self-anchoring, single-item indicator was scored on a scale from 0 (*very poor*) to 10 (*very good*). The Cantrill Ladder has been reported to have good validity and stability and reasonable reliability (Atkinson, 1982). To test whether mothers who reported different levels of well-being were differentially affected by the intervention program, we applied a median split.

Difficult temperament. Child temperament (as perceived by the mother) was measured during the screening phase with the Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979). The ICQ was translated into Dutch and found valid and reliable by Kohnstamm (1984). The Dutch ICQ contains 33 items describing concrete 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 CBCL/1.5-5 (Achenbach & Rescorla, 2000), 5 items in the ICQ were discarded because of 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 (more information can be found in the electronic appendixes on the publisher's Web site). 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 alphas) were .68, .76, and .75, respectively. We computed scale scores by averaging item scores. To test whether children with a difficult temperament were more susceptible to the intervention efforts than relatively easy children, we split the sample into a group of temperamentally difficult children and a group of children with a relatively easy temperament. An a priori split was made on the 82.7th percentile in the general population screening sample, in accordance with the commonly used borderline/clinical cutoff for the CBCL (see also Klein Velderman et al., 2006). Because the three age groups differed in their temperament levels, splits were made separately for each age group.

Externalizing problems. The widely used and extensively validated CBCL/1.5-5 (Achenbach & 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 described behaviors in the last 2 months on a 3-point scale (0 = *not true*, 2 = *very true or often true*). Using confirmatory factor analysis, Van Zeijl et al. (2006) found that the broadband Externalizing Problems scale reported for 2- and 3-year-olds by Koot, Van den Oord, Verhulst, and Boomsma (1997) was also applicable to 1-year-old children. To investigate to what extent specific aspects of externalizing problems were affected by the intervention, in this study we used the three narrowband Externalizing Problems scales—that is, Overactive (5 items), Oppositional (17 items), and Aggressive (9 items). The internal consistencies (Cronbach's alpha) were .66, .89, and .75, respectively.

Maternal attitudes toward sensitivity and sensitive discipline. Two weeks after the posttest laboratory session, the mothers received a questionnaire by mail regarding their attitudes toward parenting (Bakermans-Kranenburg & Van IJzendoorn, 2003). They were asked to indicate their attitudes' position on a 10-cm line ranging from *totally disagree* to *totally agree*. Two attitude subscales were extracted: attitudes toward sensitivity, consisting of 9 items (e.g., "In my opinion, I should praise my child at least once every day"), and attitudes toward sensitive discipline, consisting of 10 items (e.g., "My child must learn that I will get angry when he/she does not listen to me," reversed). We computed total scores by summing item scores. Cronbach's alphas were .54 and .58 for attitudes toward sensitivity and attitudes toward sensitive discipline, respectively.

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 drawn from Egeland, Erickson, Clemenhagen-Moon, Hiester, and Korfmacher (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 they were added.

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; 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, Kochanska, Radke-Yarrow, and Girmius-Brown (1987) and Van der Mark, Van IJzendoorn, and Bakermans-Kranenburg (2002). The following maternal discipline strategies were observed: distraction, induction, understanding (positive strategies), prohibition, physical obstruction, and giving in (negative strategies). 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. Understanding was coded when mothers displayed interest in or understanding of the child's feelings or thoughts. Prohibition concerned any prohibition, command, or disapproval with respect to the child's behavior. Physical obstruction was coded when mothers in any way physically obstructed the child from getting the treat. Finally, giving in was coded when mothers did not follow through on (part of) a prohibition, by either actively or passively giving in. 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 (in both the pre- and the 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 a standard 10-min duration. The average intraclass correlation (single rater, absolute agreement) for intercoder reliability (for all separate pairs of five coders) was .85 (range = .61–.95; $n = 30$). We computed an overall positive and an overall negative discipline score by adding the frequencies of, respectively, the three positive discipline strategies (factor loadings were .79, .57, and .78) and the three negative discipline strategies (factor loadings were .85, .82, and .42). Because the three subscales were not equally distributed, subscale scores were standardized before being summed.

Statistical Analyses

There were some missing values (1.5% of the data) on the screening variables (1 for marital discord, 8 for maternal well-being), pretest measures (8 for maternal discipline, 2 for child externalizing behaviors), and posttest outcome measures (1 for maternal sensitivity, 3 for maternal discipline, and 13 for maternal attitudes). Because these missing values were randomly distributed across items and participants, they were substituted with the mean score on the variable for children with the same sex, age, parental educational level, and experimental condition, as a conser-

vative imputation method (Tabachnick & Fidell, 2001), to uniformly include the total set of 237 children in the analyses. Results were similar when missing data were excluded from the analyses and when the imputation strategy of expectation maximization (Tabachnick & Fidell, 2001) was applied.

Outliers were found for maternal well-being, marital discord, child aggressive behavior at the pretest, and observed maternal discipline strategies at the pre- and posttest. These data were not excluded, in keeping with 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). However, when outliers ($z > 13.291$) were Winsorized (i.e., "moved in close to the good data"; Hampel, Ronchetti, & Rousseeuw, 1986, p. 69) by replacement of the outlying scores with the next highest value (with $z < 13.291$) in the distribution, results were similar.

To investigate intervention effects, we applied repeated measures multivariate analyses of variance (MANOVAs) to examine pretest–posttest changes and 2×2 MANOVAs in case of outcome variables only assessed at posttest (maternal attitudes). The dichotomous variable child sex was related to outcome variables in both the intervention and the control group, F s ranged from 0.01 ($p = .94$, $dfs = 1, 100$) to 12.45 ($p < .01$, $dfs = 1, 103$), as was the variable age group (1-, 2-, and 3-year-old children), F s ranged from 0.02 ($p = .98$) to 27.04 ($p < .01$, $dfs = 2, 99$). Both variables were entered as factors in the aforementioned analyses to test for differential treatment effects, as were the following factors: child temperament (relatively easy vs. difficult), level of daily hassles (low vs. high), level of marital discord (low vs. high), level of maternal well-being (low vs. high), and professional training level of the interveners (university degree vs. undergraduate).

Results

Preliminary Analyses

To check the random group assignment and to establish the initial similarity of the intervention and control groups, we applied independent sample t tests to the screening variables and pretest values of all outcome measures. There were no significant differences between the intervention and control groups on any of these measures (all p s $> .18$; see also Table 2 for descriptive statistics for all measures).

Correlations among all variables of interest are presented separately for the intervention and control groups in Table 3. Pre- and posttest assessments of the same construct were significantly correlated in both the intervention and the control group. Clusters of child and maternal behaviors, respectively, tended to be significantly interrelated, whereas in both the intervention and the control group no strong associations between mother and child behaviors were found. Maternal attitudes were not significantly related to maternal behaviors at the posttest, and there was only one significant correlation with child behavior at the posttest (with oppositional child behaviors in the intervention group). Results of Fisher's Z tests indicated that only 11 out of 190 correlations were significantly different in the intervention compared with the control group.

Intervention Effects

To assess intervention effects on maternal attitudes (measured at posttest only), we performed a MANOVA on attitudes toward sensitivity and attitudes toward sensitive discipline, with experi-

Table 2
Descriptive Statistics for All Measures

Measure	Total sample (<i>N</i> = 237)		Control group (<i>n</i> = 117)		Intervention group (<i>n</i> = 120)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Screening						
Child temperament	1.89	0.52	1.87	0.48	1.90	0.56
General daily hassles	20.47	12.70	20.00	12.51	20.93	12.92
Marital discord ^a	2.13	1.84	2.20	1.83	2.06	1.85
Maternal well-being ^b	6.74	1.54	6.73	1.46	6.74	1.61
Pretest						
Child externalizing behavior ^c						
Overactive	4.38	1.72	4.46	1.65	4.30	1.79
Oppositional	15.58	5.80	15.52	5.98	15.64	5.74
Aggressive	5.11	2.71	5.22	2.51	5.01	2.89
Maternal sensitivity ^d	0.00	2.29	-0.20	2.36	0.20	2.22
Maternal discipline ^e						
Positive discipline	0.00	2.15	0.10	2.14	-0.10	2.17
Negative discipline	0.00	2.13	0.00	2.40	-0.00	1.84
Posttest						
Child externalizing behavior						
Overactive	3.81	1.90	4.05	1.90	3.58	1.87
Oppositional	14.35	5.68	14.68	5.87	14.02	5.49
Aggressive	4.84	3.10	4.90	3.14	4.78	3.07
Maternal sensitivity ^f	0.00	2.31	0.00	2.44	-0.00	2.19
Maternal discipline ^g						
Positive discipline	0.00	2.08	-0.36	1.65	0.35	2.38
Negative discipline	0.00	2.32	0.07	2.40	-0.07	2.26
Maternal attitudes ^h						
Toward sensitivity	62.15	10.39	59.24	9.83	65.01	10.17
Toward sensitive discipline	59.05	11.46	57.37	11.39	60.71	11.33

^a *n* = 236. ^b *n* = 229. ^c *n* = 235. ^d Standardized values. ^e Standardized values, *n* = 229. ^f Standardized values, *n* = 236. ^g Standardized values, *n* = 234. ^h *n* = 224.

mental condition as the between-subjects factor. According to Wilks's criterion, the combined dependent variables were significantly affected by the intervention, $F(2, 234) = 11.00, p < .01$ (partial $\eta^2 = .09$). Univariate tests revealed that after receiving the intervention, mothers in the intervention group had more favorable attitudes toward sensitivity, $F(1, 235) = 18.88, p < .01$ (partial $\eta^2 = .07$), and toward sensitive discipline, $F(1, 235) = 4.49, p < .05$ (partial $\eta^2 = .02$), than control group mothers at the posttest (see also Table 2 for descriptive statistics). Treatment effectiveness was not related to child characteristics (sex, age, temperament), family characteristics (level of daily hassles, marital discord, and maternal well-being), or professional training level of the intervener.

We performed a repeated measures MANOVA with experimental condition as a between-subjects factor and time as a within-subject factor to assess intervention effects on parenting: maternal sensitivity, positive discipline, and negative discipline. The Experimental Condition \times Time interaction effect was significant, $F(3, 233) = 4.19, p < .01$ (partial $\eta^2 = .05$). Univariate tests showed that intervention group mothers displayed more positive discipline over time, $F(1, 235) = 8.33, p < .01$ (partial $\eta^2 = .03$), compared

with control group mothers (see also Table 2). Again, treatment effectiveness was unrelated to child sex, age, and temperament as well as to the level of hassles, marital discord, maternal well-being, and professional training level of the intervener.

To test whether the intervention affected child behaviors (overactive, oppositional, and aggressive behaviors), we conducted a repeated measures multivariate analysis of covariance, with experimental condition as a between-subjects factor and time as a within-subject factor. Child temperament was entered as a covariate, because of the conceptual and statistical associations with externalizing behaviors. There was no interaction effect between experimental condition and time, $F(3, 232) = 1.32, p = .27$ (see also Table 2). However, the Experimental Condition \times Time \times Marital Discord interaction was significant, $F(3, 227) = 3.02, p < .05$ (partial $\eta^2 = .04$). Univariate tests showed that, especially in families with more marital discord, the intervention was effective in decreasing overactive child behavior, $F(1, 229) = 8.11, p < .01$ (partial $\eta^2 = .03$). Similarly, there was a significant interaction among experimental condition, time, and level of daily hassles, $F(3, 227) = 2.77, p < .05$ (partial $\eta^2 = .04$). Particularly in families with more daily hassles, the intervention was effective in

Table 3
Correlations Among All Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Control group (<i>n</i> = 117)																	
Child characteristics																		
1. Temperament	—	.21*	.16	-.19*	.10	.22*	.15	.06	.06	-.05	.17	.19*	.22*	.05	-.02	.11	.17	.04
Screening																		
2. General daily hassles	.25**	—	.42**	-.56**	-.15	.14	.16	-.20*	-.26**	-.16	-.03	.10	.12	-.02	-.04	-.09	.17	-.06
3. Marital discord ^a	.22*	.46**	—	-.49**	-.04	.07	.20*	-.10	-.20*	-.15	.10	.10	.20*	-.05	-.19*	-.02	.17	.07
4. Maternal well-being ^b	-.21*	-.57**	-.40**	—	.05	-.15	-.13	.05	.13	.15	-.08	-.17	-.18	.07	.20*	.00	.10	.03
Pretest																		
Child externalizing behavior ^c																		
5. Overactive	.24**	.07	.19*	-.03	—	.51**	.39**	-.03	-.15	.09	.51**	.45**	.16	-.05	-.03	-.12	.11	-.10
6. Oppositional	.33**	.06	.16	.07	.39**	—	.52**	.02	-.19*	-.12	.31**	.70**	.21*	.03	-.07	-.20*	.00	-.06
7. Aggressive	.22**	.09	.38**	.05	.20*	.39**	—	-.27**	-.25**	-.03	.25**	.45**	.50**	-.13	-.07	.12	.04	-.03
Maternal sensitivity and discipline ^d																		
8. Sensitivity	-.17	-.13	-.08	.07	-.34**	.11	-.11	—	.25**	-.08	-.18*	-.01	-.29**	.43**	.01	-.22*	-.03	-.02
9. Positive discipline	.13	-.01	-.03	.11	-.03	-.13	-.09	.00	—	.48**	-.16	-.20*	-.09	-.06	.29**	.14	-.16	.09
10. Negative discipline	.18	.05	.12	.01	.34**	.17	.07	-.12	.40**	—	.00	-.20*	-.03	-.15	.17	.20*	-.13	.10
Posttest																		
Child externalizing behavior																		
11. Overactive	.18	.05	.16	-.02	.66**	.31**	.17	-.29**	-.08	.26**	—	.46**	.37**	-.14	.03	.08	.06	-.13
12. Oppositional	.19*	.16	.26**	-.14	.35**	.48**	.30**	-.11	-.14	-.03	.52**	—	.49**	-.04	-.02	-.04	-.02	-.13
13. Aggressive	.27**	.28**	.49**	-.19*	.08	.23*	.64**	-.14	-.06	-.04	.19*	.49**	—	-.16	-.02	.25**	-.06	-.16
Maternal sensitivity ^e and discipline ^f																		
14. Sensitivity	-.07	-.13	-.06	-.02	-.25**	-.02	-.17	.43**	.10	-.02	-.29**	-.16	-.11	—	.08	-.17	.18	.07
15. Positive discipline	.17	.13	.23*	.08	.01	.06	-.01	.00	.30**	.24**	-.02	-.06	.08	.12	—	.22*	.17	-.02
16. Negative discipline	.26**	.15	.12	.08	.09	.06	.12	-.21*	.18	.24**	.11	.05	.25**	-.20*	.45**	—	-.11	-.10
Maternal attitudes ^g																		
17. Toward sensitivity	.04	-.05	.11	.14	.16	.21*	.04	.21*	-.16	-.12	.12	.19*	.06	-.02	.01	-.05	—	.07
18. Toward sensitive discipline	.00	-.21*	-.19*	.20*	.02	.08	-.06	.02	-.05	.00	-.07	-.11	-.12	-.06	.01	.00	.08	—
	Intervention group (<i>n</i> = 120)																	

Note. *n*_{intervention group} = 120, *n*_{control group} = 117.
^a *n*_{intervention group} = 119, *n*_{control group} = 117. ^b *n*_{intervention group} = 119, *n*_{control group} = 111. ^c *n*_{intervention group} = 116, *n*_{control group} = 113. ^d *n*_{intervention group} = 116, *n*_{control group} = 113. ^e *n*_{intervention group} = 119, *n*_{control group} = 111. ^f *n*_{intervention group} = 118, *n*_{control group} = 117. ^g *n*_{intervention group} = 113, *n*_{control group} = 111.
 * *p* < .05. ** *p* < .01.

decreasing overactive child behavior, $F(1, 229) = 6.79, p < .05$ (partial $\eta^2 = .03$). Treatment effectiveness was not related to child characteristics (sex, age, and temperament), maternal well-being, or professional training level of the intervener.

The change in maternal attitudes toward sensitivity and toward sensitive discipline and the change in sensitive discipline behaviors did not mediate the change in children's overactive problem behavior, given that posttest assessments of these parenting variables were not associated with this child outcome variable. Similarly, attitudes toward sensitive discipline did not mediate the change in sensitive discipline behaviors.

Discussion

In a randomized controlled trial with families screened for children's relatively high scores on externalizing behavior, the attachment-based intervention program VIPP-SD proved to be effective. The intervention program, based on a combination of insights derived from attachment theory and coercion theory, did improve maternal attitudes toward sensitivity and sensitive discipline, and it enhanced actual maternal sensitive discipline. Furthermore, it resulted in a decrease of overactive behaviors in children of families with higher levels of daily hassles and families with higher levels of marital discord.

The VIPP-SD program proved to be effective in stimulating positive maternal attitudes toward sensitive child rearing and sensitive discipline, but a change in attitudes does not necessarily imply a similar change in maternal behaviors toward the child. As have numerous other parenting studies (Holden, 1995), the current investigation documents the divergence between maternal attitudes and practices, as we did not find any relation between attitudes toward sensitivity or sensitive discipline and actual maternal sensitive (discipline) behaviors. Nevertheless, the VIPP-SD intervention did affect maternal practices—that is, it enhanced the use of positive discipline strategies. The intervention program was less effective in decreasing negative discipline strategies, possibly because the intervention protocol mainly focused on reinforcing positive interactions and effective parenting strategies. Observed sensitive responsiveness also remained unaffected. We suggest that, because of the specific needs of our sample of children with relatively high levels of externalizing problems, parents were more open to adapting their discipline strategies in conflict situations than to applying more sensitive practices in nonconflict situations. Adequate discipline strategies probably have more direct effects on challenging child behaviors, whereas effects of sensitive parenting may be less easy to notice for parents of children with relatively high levels of externalizing behavior.

Intervention effects on overactive child behaviors depended on the level of marital discord and the level of daily hassles in the family. As hypothesized, the VIPP-SD program was most effective in families in greatest need of support and affected the rate of overactive problem behaviors in the children, although it did not manage to decrease oppositional or aggressive problem behaviors. A closer look at the CBCL items constituting the three scales for externalizing problem behaviors shows that the overactive behavior items indicate the child's inclination for disruptive behavior (e.g., cannot sit still, quickly shifts activity), but to a less severe degree than the items included in the oppositional and aggressive scales (e.g., has temper tantrums, attacks people). Because our

VIPP-SD program was restricted to six sessions, its effectiveness might have been limited to the less severe problem behaviors, but further investigations with varying numbers of intervention sessions are needed to test this conjecture. Alternatively, the intervention effects on oppositional or aggressive behavior may become apparent or larger during the course of the child's later development (cf. Van Lier, Vuijk, & Crijnen, 2005).

The changed maternal attitudes and behaviors, as assessed in the current study, did not causally mediate the change in children's overactive problem behavior. More favorable attitudes toward sensitivity and sensitive discipline and enhanced sensitive discipline behaviors were not related to overactive problem behaviors in the children. Thus, the precise mechanism through which the children's problem behaviors were affected still has to be uncovered. Because we applied intervention strategies focusing on mother-child interactive behaviors (through the use of video feedback and the mirroring of behavior), we have evidence for the idea that mothers of children with externalizing behavior problems profit from being taught to carefully observe their children, to respond to them in an appropriate manner, and to discipline their rule-breaking behaviors in a gentle but consistent way, even without extension of the mothers' support system or discussion of their cognitive representations of attachment (Bakermans-Kranenburg et al., 2003). However, our measures apparently were not sufficiently broad to capture all changes in the mothers, especially those associated with changes in the child. More extensive, multimethod measurements are needed to uncover the mechanisms underlying the effect of specific enhanced parenting behaviors on child outcomes. Furthermore, larger samples are needed to assess mediational processes in families with relatively high levels of marital discord or daily hassles.

The effectiveness of the VIPP-SD intervention was independent of child characteristics such as age, sex, or temperament. Families with younger children did not profit more from the intervention than families with older children. It should, however, be noted that the intervention was conducted with a rather age-homogeneous sample of infants and toddlers and that we cannot exclude the possibility that much earlier or later interventions would be less or even more successful. According to a meta-analysis of attachment-based interventions, the idea that earlier is better could not be substantiated (Bakermans-Kranenburg et al., 2003). Also, children with a difficult temperament were not differentially affected by the intervention compared with children with a relatively easy temperament. The use of the ICQ (Bates et al., 1979) to assess temperament limits the temperamental dimension included in the current intervention to difficulty. Other dimensions may be more important from the perspective of differential susceptibility, such as behavioral inhibition (Kagan, Reznick, & Gibbons, 1989), fearfulness (Kochanska, 1995), or emotional reactivity (Belsky, 2005; Klein Velderman et al., 2006).

The VIPP-SD intervention program showed statistically significant effects on maternal attitudes and sensitive discipline behaviors as well as on children's overactive problem behaviors. The question is, however, whether its effectiveness is sizable as well. We argue that the program indeed affected the families in a substantial way. Partial eta-squared effect sizes ranged from .07 to .02, which implies a range of Cohen's *d* effect sizes of 2.46 for attitudes toward sensitivity to 0.45 for overactive child behaviors in families with relatively high levels of daily hassles. In terms of

the binomial effect size display (McCartney & Rosenthal, 2000), defined as the change in success ratio as a result of an intervention, the effect size $d = 0.45$ indicates a success ratio in the experimental group of $.50 + .11 = .61$; the success ratio in the control group would be $.50 - .11 = .39$. The difference of 22% between the experimental and control groups indicates that the VIPP-SD program can certainly make a substantial difference in the life of young children and their parents struggling with externalizing problem behaviors. Of course, the VIPP-SD program is rather brief, and the problem behaviors addressed are quite complex. Exaggerated expectations about the program's effectiveness should therefore be tempered. However, the effect size found in this study is similar to what in the medical sciences is regarded as a substantial treatment effect (McCartney & Rosenthal, 2000).

The main limitation of this study concerns sample characteristics. Response rates were moderate, families from higher socioeconomic backgrounds were overrepresented, and families with a non-Caucasian background were excluded. However, our sample did not diverge much from other Dutch population samples, such as the sample of Verhulst, Akkerhuis, and Althaus (1985). Even though families participating in the intervention study did show higher levels of child externalizing problems, marital discord, and daily hassles as well as lower levels of maternal well-being compared with families in the initial screening group, it remains to be tested whether the VIPP-SD intervention program is similarly effective in more troubled families from lower socioeconomic backgrounds. Because in our sample VIPP-SD was most effective in the most troubled families, we suggest that this approach will also be feasible in families from a low socioeconomic status background. Further research into the generalizability of our findings to families from other cultural backgrounds is necessary. A second limitation concerns our measurements. Because of the potential overload to parents and children, not all constructs could be measured at all times. Child temperament, for example, was only assessed during the screening phase, and parenting attitudes were only assessed at posttest. Furthermore, our measures were not sufficiently broad to capture those changes in maternal behaviors that caused the decrease in overactive child behaviors. The present findings might have been constrained by the fact that there were no home observations of parenting and child behaviors, although finding effects of our home-based intervention in laboratory assessments of maternal as well as child behavior is important in refuting the training-to-the-test interpretation of program effectiveness.

The feasibility of VIPP-SD on a large-scale basis is facilitated by its rather short duration, its detailed manual, and the relatively modest training required for implementing the intervention. We found that, in total, 170 hr of instruction and practice in VIPP-SD for 10 interveners was sufficient to adequately implement the intervention. The VIPP-SD intervention proved to be equally effective when implemented by interveners who had a university degree or who were master's students in child development. Because the intervention trajectory is limited to six sessions in an 8-month-period, program attendance was high (all participants received the six complete home visits), and families were not confronted with staff turnover (Spieker, Nelson, DeKlyen, & Staerckel, 2005).

Elsewhere, we have argued for a piecemeal approach to constructing effective interventions, starting with testing the effective-

ness of small building blocks or intervention modules that, after successful evaluations, might be combined into an even more effective overall program (Van IJzendoorn, Bakermans-Kranenburg, & Juffer, 2005). Also, the modular approach fits nicely into a stepwise upgrading of intervention intensity, whereby one might start with a single intervention module addressing the most common problems (e.g., VIPP-SD) and continue with more specific modules if earlier intervention efforts do not bear fruit in supporting more seriously disturbed families. Our VIPP-SD intervention program may be combined with effective components of other intervention programs, such as Interaction Guidance (McDonough, 2004), Steps Toward Effective, Enjoyable Parenting (STEEP; Erickson, Korfmacher, & Egeland, 1992), and Incredible Years (Reid, Webster-Stratton, & Hammond, 2003).

In sum, the VIPP-SD intervention program, based on attachment theory and coercion theory, was rigorously tested in a randomized trial using a detailed intervention manual, a dummy treatment for the control group, and independent coders unaware of group status and other pertinent characteristics of the participants. VIPP-SD proved to be effective in enhancing maternal attitudes toward sensitivity and sensitive discipline and actual sensitive discipline parenting behaviors, and it resulted in a decrease in overactive behaviors in children of families with more daily hassles and families with more marital discord. Therefore, VIPP-SD should become an important module in attachment-based interventions.

References

- Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA Preschool Forms & Profiles*. Burlington: University of Vermont, Research Center for Children, Youth, & Families.
- Ainsworth, M. D. S., Bell, S. M., & Stayton, D. F. (1974). Infant-mother attachment and social development: Socialization as a product of reciprocal responsiveness to signals. In M. P. Richards (Ed.), *The integration of a child into a social world* (pp. 99–135). New York: Cambridge University Press.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.
- Alink, L. R. A., Mesman, J., Van Zeijl, J., Stolk, M. N., Juffer, F., Koot, H. M., et al. (2006). The early childhood aggression curve: Development of physical aggression in 10- to 50-month-old children. *Child Development, 77*, 954–966.
- Atkinson, T. (1982). The stability and validity of quality of life measures. *Social Indicators Research, 10*, 113–132.
- Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2003). *Vragenlijst voor kennis en attitudes over de opvoeding* [Questionnaire concerning knowledge and attitudes toward parenting]. Unpublished manuscript, Leiden University, Leiden, the Netherlands.
- Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin, 129*, 195–215.
- Bates, J. E., Freeland, C. A. B., & Lounsbury, M. L. (1979). Measurement of infant difficultness. *Child Development, 50*, 794–803.
- Beauchaine, T. P., Webster-Stratton, C., & Reid, M. J. (2005). Mediators, moderators, and predictors of 1-year outcomes among children treated for early-onset conduct problems: A latent growth curve analysis. *Journal of Consulting and Clinical Psychology, 73*, 371–388.
- Belsky, J. (1997a). Theory testing, effect-size evaluation, and differential susceptibility to rearing influence: The case of mothering and attachment. *Child Development, 64*, 598–600.

- Belsky, J. (1997b). Variation in susceptibility to environmental influence: An evolutionary argument. *Psychological Inquiry*, 8, 182–186.
- Belsky, J. (2005). The developmental and evolutionary psychology of intergenerational transmission of attachment. In C. S. Carter, L. Ahnert, K. E. Grossmann, S. B. Hrdy, M. E. Lamb, S. W. Porges, & N. Sacher (Eds.), *Attachment and bonding: A new synthesis* (pp. 169–198). Cambridge, MA: MIT Press.
- Belsky, J., Woodworth, S., & Crnic, K. (1996). Trouble in the second year: Three questions about family interaction. *Child Development*, 67, 556–578.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment* (rev. ed.). Harmondsworth, England: Penguin.
- Burke, J. D., Loeber, R., & Birmaher, B. (2002). Oppositional defiant disorder and conduct disorder: A review of the past 10 years, Part II. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 1275–1293.
- Campbell, S. B. (2002). *Behavior problems in preschool children: Clinical and developmental issues*. New York: Guilford Press.
- Campbell, S. B., & Ewing, L. J. (1990). Follow-up of hard-to-manage preschoolers: Adjustment at age 9 and predictors of continuing symptoms. *Journal of Child Psychology and Psychiatry*, 31, 871–889.
- Cantrill, H. (1965). *The pattern of human concerns*. Piscataway, NJ: Rutgers University Press.
- Carter, S. L., Osofsky, J. D., & Hann, D. M. (1991). Speaking for the baby: A therapeutic intervention with adolescent mothers and their infants. *Infant Mental Health Journal*, 12, 291–301.
- DeKlyen, M., & Speltz, M. L. (2001). Attachment and conduct disorder. In J. Hill & B. Maughan (Eds.), *Conduct disorders in childhood and adolescence* (pp. 320–345). New York: Cambridge University Press.
- Egeland, B., Erickson, M. F., Clemenham-Moon, J. C., Hiester, M. K., & Korfmacher, J. (1990). *24 months tools coding manual*. Project STEEP revised 1990 from mother-child project scales. Unpublished manuscript, University of Minnesota, Minneapolis.
- Erickson, M. F., Korfmacher, J., & Egeland, B. (1992). Attachments past and present: Implications for the therapeutic intervention with mother-infant dyads. *Development and Psychopathology*, 4, 495–507.
- Fagot, B. I. (1997). Attachment, parenting, and peer interactions of toddler children. *Developmental Psychology*, 33, 489–499.
- Greenberg, M. T. (1999). Attachment and psychopathology in childhood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 469–496). New York: Guilford Press.
- Greenberg, M. T., Speltz, M. L., DeKlyen, M., & Endriga, M. C. (1991). Attachment security in preschoolers with and without externalizing behavior problems: A replication. *Development and Psychopathology*, 3, 413–430.
- Hampel, F. R., Ronchetti, E. M., & Rousseeuw, P. J. (1986). *Robust statistics: The approach based on influence functions*. New York: Wiley.
- Hinshaw, S. P. (2002). Intervention research, theoretical mechanisms, and causal processes related to externalizing behavior patterns. *Development and Psychopathology*, 14, 789–818.
- Hoffman, M. L. (1984). Empathy, its limitations, and its role in a comprehensive moral theory. In J. L. Gewirtz & W. Kurtines (Eds.), *Morality, moral development, and moral behavior* (pp. 283–302). New York: Wiley.
- Holden, G. W. (1995). Parental attitudes towards childrearing. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 3. Status and social conditions of parenting* (pp. 359–392). Hillsdale, NJ: Erlbaum.
- Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005a). Enhancing children's socio-emotional development: A review of intervention studies. In D. M. Teti (Ed.), *Handbook of research methods in developmental science* (pp. 213–232). Oxford, England: Blackwell Publishers.
- Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005b). The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, 46, 263–274.
- Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (Eds.). (in press). *Promoting positive parenting: An attachment-based intervention*. Mahwah, NJ: Erlbaum.
- Kagan, J., Reznick, J. S., & Gibbons, J. (1989). Inhibited and uninhibited types of children. *Child Development*, 60, 838–845.
- Kanner, A. D., Coyne, J. C., Schaffer, C., & Lazarus, R. S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine*, 4, 1–39.
- Kendziora, K. T. (2004). Early intervention for emotional and behavioral disorders. In R. B. Rutherford, M. M. Quin, & S. R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 327–351). New York: Guilford Press.
- Keppel, G., & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook* (4th international ed.). Upper Saddle River, NJ: Pearson Prentice-Hall.
- Klein Velderman, M., Bakermans-Kranenburg, M. J., Juffer, F., & Van IJzendoorn, M. H. (2006). Effects of attachment-based interventions on maternal sensitivity and infant attachment: Differential susceptibility of highly reactive infants. *Journal of Family Psychology*, 20, 266–274.
- Kochanska, G. (1995). Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66, 597–615.
- Kohnstamm, G. A. (1984, April). *Bates' Infant Characteristics Questionnaire (ICQ) in the Netherlands*. Paper presented at the International Conference on Infant Studies, New York.
- Koot, H. M. (1997). *Handleiding bij de vragenlijst voor gezinsproblemen* [Manual accompanying the Dutch Family Problems Questionnaire]. Rotterdam, the Netherlands: Sophia Kinderziekenhuis/Erasmus Universiteit, Afdeling Kinder-en Jeugdpsychiatrie.
- Koot, H. M., Van den Oord, E. J. C. G., Verhulst, F. C., & Boomsma, D. I. (1997). Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the Child Behavior Checklist/2–3. *Journal of Abnormal Child Psychology*, 25, 183–196.
- Kuczynski, L., Kochanska, G., Radke-Yarrow, M., & Girmius-Brown, O. (1987). A developmental interpretation of young children's noncompliance. *Developmental Psychology*, 23, 799–806.
- Lieberman, A. F. (2004). Child-parent psychotherapy: A relationship-based approach to the treatment of mental health disorders in infancy and early childhood. In A. J. Sameroff, S. C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems* (pp. 97–122). New York: Guilford Press.
- McCartney, K., & Rosenthal, R. (2000). Effect size, practical importance, and social policy for children. *Child Development*, 71, 173–180.
- McDonough, S. C. (2004). Interaction guidance: Promoting and nurturing the caregiving relationship. In A. J. Sameroff, S. C. McDonough, & K. L. Rosenblum (Eds.), *Treating parent-infant relationship problems* (pp. 79–96). New York: Guilford Press.
- Mesman, J., & Koot, H. M. (2001). Early preschool predictors of preadolescent internalizing and externalizing DSM-IV diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1029–1036.
- Mesman, J., Stolk, M. N., Van Zeijl, J., Alink, L. R. A., Juffer, F., Bakermans-Kranenburg, M. J., et al. (in press). Extending the video-feedback intervention to sensitive discipline: The early prevention of antisocial behavior. In F. Juffer, M. J. Bakermans-Kranenburg, & M. H. Van IJzendoorn (Eds.), *Promoting positive parenting: An attachment-based intervention*. Mahwah, NJ: Erlbaum.
- Olson, S. L., Bates, J. E., Sandy, J. M., & Lanthier, R. (2000). Early

- developmental precursors of externalizing behavior in middle childhood and adolescence. *Journal of Abnormal Child Psychology*, 28, 119–133.
- Patterson, G. R. (1976). The aggressive child: Victim and architect of a coercive system. In E. J. Mash, L. A. Hamerlynck, & L. C. Handy (Eds.), *Behavior modification and families* (pp. 267–316). New York: Brunner/Mazel.
- Patterson, G. R. (1982). *Coercive family process: A social learning approach*. Eugene, OR: Castalia.
- Prinz, P., Ongena, P., Hellinckx, W., Grietens, H., Ghesquiere, P., & Colpin, H. (2003). The additive and interactive effects of parenting and children's personality on externalizing behavior. *European Journal of Personality*, 17, 95–117.
- Reid, M. J., Webster-Stratton, C., & Hammond, M. (2003). Follow-up of children who received the Incredible Years intervention for oppositional defiant disorder: Maintenance and prediction of 2-year outcome. *Behavior Therapy*, 34, 471–491.
- Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, 116, 55–74.
- Snyder, J. J. (1995). Coercion: A two-level theory of antisocial behavior. In W. T. O'Donohue & L. Krasner (Eds.), *Theories of behavior therapy: Exploring behavior change* (pp. 313–348). Washington, DC: American Psychological Association.
- Spieker, S., Nelson, D., DeKlyen, M., & Staerkel, F. (2005). Enhancing early attachments in the context of Early Head Start: Can programs emphasizing family support improve rates of secure infant-mother attachments in low-income families? In L. J. Berlin, Y. Ziv, L. Amaya-Jackson, & M. T. Greenberg (Eds.), *Enhancing early attachments: Theory, research, intervention, and policy* (pp. 250–275). New York: Guilford Press.
- Sroufe, L. A. (1979). The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist*, 34, 834–841.
- Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005). *The development of the person: The Minnesota study of risk and adaptation from birth to adulthood*. New York: Guilford Press.
- Stein, A., Woolley, H., Senior, R., Hertzmann, L., Lovel, M., Lee, J., et al. (2006). Treating disturbances in the relationship between mothers with bulimic eating disorders and their infants: A randomized, controlled trial of video feedback. *American Journal of Psychiatry*, 163, 899–906.
- Stolk, M. N., Mesman, J., Van Zeijl, J., Alink, L. R. A., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., et al. (in press). Early parenting intervention aimed at maternal sensitivity and discipline: A process evaluation. *Journal of Community Psychology*.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). London: Allyn and Bacon.
- Van der Mark, I., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2002). Development of empathy in girls during the second year of life: Associations with parenting, attachment, and temperament. *Social Development*, 11, 451–468.
- Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Juffer, F. (2005). Why less is more: From the dodo bird verdict to evidence-based interventions on sensitivity and early attachments. In L. J. Berlin, Y. Ziv, L. Amaya-Jackson, & M. T. Greenberg (Eds.), *Enhancing early attachments: Theory, research, intervention, and policy* (pp. 297–312). New York: Guilford Press.
- Van Lier, P. A., Vuijk, P., & Crijnen, A. A. (2005). Understanding mechanisms of change in the development of antisocial behavior: The impact of a universal intervention. *Journal of Abnormal Child Psychology*, 33, 521–535.
- van Zeijl, J., Mesman, J., Stolk, M. N., Alink, L. R. A., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., et al. (2006). Terrible ones? Assessment of externalizing behaviors in infancy with the Child Behavior Checklist. *Journal of Child Psychology and Psychiatry*, 47, 801–810.
- Verhulst, F. C., Akkerhuis, G. W., & Althaus, M. (1985). Mental health in Dutch children: I. A cross-cultural comparison. *Acta Psychiatrica Scandinavica Supplementum*, 72, 1–108.

Received November 10, 2005

Revision received May 30, 2006

Accepted May 30, 2006 ■