

Influencing Mother-Infant Interaction Through Videotaped or Written Instruction: Evaluation of a Parent Education Program

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This article presents the results of an evaluation of a parent education program. In the study, the effectiveness of videotaped and written instruction is compared in a sample of 35 mother-infant dyads. The parent education program is constructed for mothers with a newborn infant and aims at enhancing maternal responsiveness to the needs and expressions of the infant. In a randomized pretest-posttest control group design, the effectiveness of videotaped or written instruction is compared, taking into account the influence of social network differences. Mother-infant interaction is observed with the use of the HOME, Belsky's system for the observation of reciprocity, and Ainsworth's scales for sensitivity and responsiveness. Results indicate that written instruction is more effective in stimulating maternal responsive involvement compared to videotaped instruction, especially in families with a large social network.

Evaluations of the effects of parent education on quality of mother-infant interaction are quite rare, although experimental stimulation of parental responsiveness to infants' needs and expressions may be important to the study of parental influences on infants' attachments. A number of studies have been carried out evaluating the effects of parent education through the Brazelton Neonatal Assessment Scales (NBAS; Anderson & Sawin, 1983; Belsky, 1985; Myers, 1982; Poley-Strobel & Anderson-Beckmann, 1987;

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Worobey & Belsky, 1982). After informing parents about NBAS outcome, Belsky (1985) found no effect on their later interactions with their infants. Worobey and Belsky (1982) found some modest short-term increases in responsive, stimulating maternal care in families from higher social classes. In their study on single mothers from lower social classes, Poley-Strobel and Anderson-Beckmann (1987) found the same positive effect, and this result was replicated in a study by Anderson and Sawin (1983). Myers (1982), however, found only positive effects of parent education through NBAS on parental knowledge and attitude, not on the quality of their interaction. These studies applied a rather atypical kind of parent education which consisted of only 1 hour of introduction to NBAS procedures and outcome in the first few days after the infant's birth. Effects were measured a few weeks or months after this intervention, sometimes without pretests (Myers, 1982) or without a "dummy" intervention for the control group (Poley-Strobel & Anderson-Beckmann, 1987). Belsky (1985), therefore, was rather skeptical about the effects of relatively brief interventions on complex parental behavior such as responsiveness.

Parent education with a somewhat broader scope seems to be more successful. Zoline and Jason (1985) demonstrated that high school students change their caregiving *attitudes* after 5 hours of discussing caregiving problems. Their caregiving behavior, however, could not be shown to be changed. Dickie and Gerber (1980) tried to evaluate an 8-week parent education program focussing on early childhood education and development. Although the sample was rather small ($N=19$), a significant difference between experimental and control groups was observed in parents' anticipation of infants' needs, reading infant cues, and contingent responding. Barrera, Rosenbaum, and Cunningham (1986) used a still more intensive kind of parent education in their sample of families with premature infants. Qualified therapists trained parents to interact responsively with their infants, which was a more successful type of training than giving parents only information about child development. Scores on the Caldwell HOME inventory were positively influenced by parent education and training. Whitt and Casey (1982) used pediatricians to influence parental caregiving behavior. The intervention included six visits to the pediatrician, who emphasized the importance of responding to infant cues by vocal, visual, and supportive physical contact. Ainsworth's (1973) scales for sensitive responsiveness were used as criterion variables, and the experimental group scored significantly higher on most of these scales.

In this study, we want to evaluate a parent education program based upon attachment theory. The program focuses upon parental responsiveness to the infant's needs and signals by introducing models of optimal caregiver-infant interaction in several difficult and "routine" situations such as severe infant distress, bathing, playing with and talking to the infant. Information about caregiving is given through videotapes or through written

brochures illustrated with drawings and photographs. In this respect, parents are being informed about caregiving and infant development, just as they are used to when they are watching TV programs on infant development or reading parent education papers. It is hypothesized that parent education through videotaped information is more effective than parent education through written material in influencing parental caregiving behavior. The use of videotapes would better fit into the way parents normally gather information about problem situations and therefore would be more effective in transferring information (Nay, 1975; O'Dell, Mahoney, Horton, & Turner, 1979; Webster-Stratton, 1982). Because the use of information about caregiving as well as the need for information about infant development could vary with size of the social network in which the caregiver is embedded (Birkel & Reppucci, 1983; Powell, 1984), this contextual variable is contained in our design. It is hypothesized that caregivers in a small social network profit more from parent education because their social environment and resources for information are more restricted.

METHOD

Subjects

Thirty-five families with both mother and father, who were contacted through midwives and physiotherapists in the first few weeks after birth, participated in the study. All infants were firstborn, normal, and healthy full terms. Twenty-three of the infants were boys, 12 were girls. Mean socioeconomic status of the families was 4.3 ($SD = 1.1$) on a scale ranging from 1 (unskilled labor) to 6 (academic professions). Fathers worked full time; half of the mothers were housewives, the other half were working part time outside the home.

Procedure

The design is a pretest-posttest control group design with randomized assignment to both groups. In the third month after the infant's birth the experimental group received videotaped information about caregiving and development of infants. Four topics were focused upon: maternal reaction to infant's crying; interaction during bathing; talking with the infant; and stimulating play with the infant. During 1 month, families got one videotape per week about one of the topics mentioned above, and at the end of every week they were interviewed about their experiences with the information. The control group received parallel information through brochures containing written material and photographs and drawings. The experimental group also received the brochures, but from the interviews it was derived that they did not use these brochures at all or much less intensively compared to the control group. We therefore evaluate here differential effects of two different kinds of instruction: brochure versus video instruction.

Between 6 and 8 weeks after the infant's birth, families were pretested. Thereafter, 4 weeks of parent education were arranged. Families were post-tested between 13 and 16 weeks after the birth. Besides randomized assignment to parent education groups, families with small and large social networks were evenly divided over both groups. Size of social network was determined by counting the number of relatives and friends with whom the mother interacted frequently, that is at least one time per week. On the basis of a pilot study, we decided to define a small network as a network in which the mother has three or fewer supporting contacts; a mother with a large social network did interact frequently with six or more people outside the family. Eight families with a large social network and nine families with a small network received parent education through videotape. Nine families with a large social network, and the same number with a small network received parent education through brochures. Size of social network was in our study related to support in solving caregiving problems. Mothers were asked to indicate (a) whether and to what extent they received support with respect to daily caregiving tasks; (b) whether they could depend upon people to babysit if necessary (1) for a longer or (2) for a shorter period of time; (c) whether they could depend upon friends or relatives to help out in case of illness; (d) whether they received caregiving advice; and (e) whether they received advice in solving concrete caregiving difficulties. A social support scale consisting of a summation of the answers to these six questions appeared to result in a significant difference between mothers with small and large social networks. Mothers with a small social network had a mean score of 6.50 ($SD=2.01$) on the social support scale, and mothers with a large social network had a mean score of 8.10 ($SD=1.90$). A t test for differences between means resulted in a t value of -2.45 ($df=33$; $p=.02$). This result validates our social network measure.

Measures

HOME. The HOME (Caldwell & Bradley, 1984) was adapted to our sample of infants by selecting four subscales (organization, play materials, involvement, and variety) and by changing a few items. Original and adapted versions of the subscales correlated highly (play materials: $r=.62$, $p<.001$; involvement: $r=.39$, $p<.05$; variety: $r=.85$, $p<.001$). Intercoder agreement for all items was 94% (range: 70%–100%).

Sensitivity. Mother–infant dyads were videotaped twice (pretest and posttest) during bathing. Videotaped interactions were analyzed using a number of Ainsworth interaction scales: sensitivity–insensitivity; mother's delight in infant; amount of physical contact; quality of physical contact; amount of auditory and vocal contact; frequency of play interaction; appropriateness of play interaction; mother's encouragement of achievement (Ainsworth, 1973). Mean intercoder reliability was .79 (range: .63–.89). The

interaction scales appeared to be intercorrelated, and they could be considered as subscales of an internally consistent overall sensitivity scale (Cronbach's α : pretest = .79; posttest = .81).

Responsiveness. During home observations, Ainsworth rating scales for responsiveness were applied. Scales were for mother's delight in infant; mother's acceptance of infant; determination of amount of food and end of feeding; mother's synchronization of rate of feeding to infant's pace; amount of interaction offered by mother; appropriateness of mother's initiations of interactions; effectiveness of mother's response to infant's crying; frequency of play interaction; appropriateness of play interaction (Ainsworth, 1973). Intercoder reliability for all scales except amount of food was satisfactory: $M = .82$ (range: .62-.93). A principal component analysis with varimax rotation showed that all scales except amount of food and synchronization of feeding loaded on one factor, which we called responsiveness. Because a principal component analysis in a sample of 35 subjects and with nine variables tends to yield unstable results (more than one variable per five subjects), we tried to confirm its outcome through computing the internal consistency of the responsiveness scale, which appeared to be satisfactory (Cronbach's α : pretest = .70; posttest = .84).

Reciprocity, Distress, Basic Care, and NonInvolvement. Reciprocal interaction is defined as responsive, mutually positive, and stimulating interaction in routine situations at home (Belsky, Taylor, & Rovine, 1984). The scale is based upon nine behavioral categories: for example, maternal vocalization, positive affect, vocalization of the infant, looking at the mother. Belsky et al. (1984) also developed three other scales for distress (i.e., interactions during distress vocalizations of the infant), basic care (bathing and caregiving behavior), and noninvolvement (maternal behavior not focused upon the child). Observations were registered per 15 s through a checklist of 27 behavioral categories. During pretest and posttest, all families were observed for at least 2 hours using the Belsky system. Intercoder reliability was .93 (range: .73-1.00). Internal consistency (Cronbach's alpha) of the reciprocity scale was .59 on the pretest and .86 on the posttest. Cronbach's alpha for the scale for distress was .86 on the pretest and .83 on the posttest. Cronbach's alpha for the noninvolvement scale was .74 on the pretest and .78 on the posttest. The scale for basic care did not appear to have satisfactory internal consistency, therefore, we deleted this variable from the analyses (Cronbach's α : pretest = .57; posttest = .55).

RESULTS

In Table 1, correlations between pretest and posttest measures are described. From Table 1 it can be derived that most measures showed change to a high degree of stability over time. Correlation coefficients on the diagonal of

Table 1. Pearson Correlations Between Measures of Mother-Infant Interaction on Pretest (upper right part) and Posttest (lower left part)

| | Mother-Infant Interaction Measures | | | | | | <i>M</i> ^a | <i>SD</i> |
|-------------------|------------------------------------|--------|--------|--------|------|-------|-----------------------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | | |
| 1. Home | .74*** | -.05 | .57*** | .27 | -.12 | .26 | 3.3 | 0.35 |
| 2. Sensitivity | .04 | .59*** | .30* | .09 | .00 | .15 | 42.1 | 8.65 |
| 3. Responsiveness | .35* | .22 | .68*** | .54*** | -.22 | -.02 | 6.5 | 1.12 |
| 4. Reciprocity | .46** | .23 | .43** | .58*** | .04 | -.27 | 10.0 | 2.16 |
| 5. Distress | .20 | -.01 | -.08 | .02 | .24 | -.10 | 0.7 | 0.37 |
| 6. Noninvolvement | -.27 | -.03 | -.32* | -.24 | -.08 | .41** | 1.4 | 1.14 |

* $p < .05$. ** $p < .01$. *** $p < .001$.

^a Means and standard deviations of the posttest measures.

Table 1 indicate that except for distress all measures correlated significantly between pretest and posttest. Correlations between posttest measures (lower left part of the table) show that the outcome of the HOME interview correlated significantly with independent observations of responsiveness and reciprocity. Higher scores on the HOME, indicating a more pedagogical organization of the environment, more adequate play material, more variation in pedagogical arrangements, and more maternal involvement, predicted more maternal responsiveness and more reciprocal interaction between mother and infant. Furthermore, responsiveness and reciprocity were correlated, and tests for curvilinearity of this correlation did not show any deviation from linearity (Lambermon & van IJzendoorn, 1988; pp. 36-37). Belsky et al. (1984) found a curvilinear relation between reciprocity and attachment quality, and they concluded that too much or too little reciprocity would have to be considered unresponsive. We found, however, that the more responsive a mother was rated, the more frequent she was engaged in reciprocal interaction with her infant. This outcome may be explained by cultural differences in caregiving style. Because *t* tests showed that the randomized intervention groups (video or brochure) and the randomized social network groups did not differ on the pretest measures, posttest measures were considered adequate criterion variables.

First, because some criterion variables were rather highly correlated, and because of the small size of our sample, a principal component analysis was carried out to reduce the number of variables. After varimax rotation, the principal component analysis yielded two factors, accounting for 54.4% of the variance. Home, responsiveness, reciprocity, and noninvolvement (negative loading) loaded more than .45 on the first factor (eigenvalue = 2.12; 35.4% of the variance). This factor was labeled *responsive involvement*. Sensitivity and distress (negative loading) loaded on the second factor (eigenvalue = 1.14), which was labeled *disfluent interaction*. After z-transforming the variables and recoding noninvolvement and sensitivity, home,

Table 2. Means and Standard Deviations of Mother-Infant Interaction Variables in Video and Brochure Groups, in Small or Large Social Networks

| Subgroups | Responsive Involvement | | Disfluent Interaction | | |
|---------------|------------------------|-----------|-----------------------|-----------|----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>N</i> |
| Small network | | | | | |
| Video | -0.93 | 2.3 | 0.80 | 0.9 | 9 |
| Brochure | -0.37 | 2.2 | -0.34 | 1.3 | 9 |
| Large network | | | | | |
| Video | -1.16 | 4.1 | -0.17 | 1.2 | 8 |
| Brochure | 2.33 | 1.2 | -0.32 | 1.9 | 9 |

responsiveness, reciprocity, and noninvolvement were added to constitute a new variable: responsive involvement. Distress and sensitivity constituted the variable disfluent interaction.

Second, a 2×2 between-subjects multivariate analysis of variance was performed on two criterion variables: responsive involvement and disfluent interaction. Independent variables were type of intervention (videotape and brochure) and social network (small and large). With the use of the Wilks' criterion, the multivariate test for the intervention by social network interaction failed to reach statistical significance, $F(2,30) = 1.88, p > .10$. The main effect for intervention did reach statistical significance, $F(2,30) = 3.48, p < .05$, whereas the main effect for social network was nonsignificant, $F(2,30) = 1.45, p > .10$. Univariate tests were performed to determine the significant main effect of intervention more precisely. The univariate test on responsive involvement reached statistical significance, $F(1,31) = 5.34, p < .05$ [*SS* (sum of squares) of the effect: 35.87; total *SS*: 244.04; $n^2 = .15$]. The univariate test on disfluent interaction did not reach statistical significance, $F(1,31) = 1.86, p > .10$. In Table 2, means and standard deviations of responsive involvement and disfluent interaction in the experimental and control groups, and in the large and small social network groups are presented. From Table 2 it can be derived that the brochure group did score higher on responsive involvement in both small and large social networks. The effect of brochure intervention tended to be greater in a large social network than in a small social network, although the univariate effect of intervention by network did not reach significance, $F(1,31) = 2.79, p = .10$. In sum, brochure intervention appeared to be more effective in stimulating responsive involvement than videotaped instruction; brochure intervention tended to be most effective in a large social network.

DISCUSSION AND CONCLUSIONS

Our first hypothesis concerned the expected superiority of parent education through videotapes. Watching videotapes about caregiving and infant

development could be more in agreement with the way in which parents usually gather information about problem situations. Videotaped information is expected to be more lively and motivating than written information (Webster-Stratton, 1982). Our study shows, however, that parent education based upon brochures can be at least as effective as videotaped information. Videotaped information is even less effective in stimulating maternal responsive involvement. About 15% of the variance in responsive involvement can be explained by parent education through brochures. It should be noted, however, that the families in our study were normal low-risk (lower middle-class families). It is obvious that the effectiveness of brochures is restricted in lower class families (as parents are unable to read or unfamiliar with written instruction).

From our interviews during the intervention we derived some possible explanations for this rather unexpected result. The interviews confirmed that videotaped information about distress and play do not stimulate application of new information into maternal practices as much as written material (Lambermon & van IJzendoorn, 1988). Furthermore, it appeared that videotapes lead to comparisons between personal experiences and videotaped illustrations of caregiving problems at a very concrete level. Concrete details about caregiving and behavioral style of the videotaped mother and infant tend to distract parents from the essential aspects of the information (Lambermon & van IJzendoorn, 1988). Parents compare themselves and their infants to the videotaped models and often have to conclude that many differences exist. Written information is more abstract in this respect and therefore does not stimulate the process of comparing the presented information with personal experience at a very concrete level. Parents are free to project their own ideas and perspectives upon the somewhat more abstract written information, and they do not exclude essential aspects of the information because concrete details do not concur with their own practices. Last, information presented through videotapes may be difficult to digest because the flow of information follows a fixed and often very fast pattern (Veen, 1982). Parents have more time to read written material and to process the information at their own pace. It is possible to reread certain difficult paragraphs of a brochure or to read a brochure again when a specific question has arisen.

Our second hypothesis concerned the mediating influence of social network. We suggested that caregivers with a small social network would profit more from parent education because their alternatives to get information from their social environment are more restricted (Belsky, 1984; Crittenden, 1985; Crockenberg & Smith, 1982). Parents from large social networks indeed receive more social support (e.g., caregiving advice) from relatives and/or friends. In this respect, our hypothesis is partly confirmed. It seems reasonable to conclude that parents from small social networks receive less

social support and thus less information. However, the first part of our hypothesis cannot be confirmed. Parents from small social networks even tend to profit less from the parent education. Written instruction tends to be especially effective in stimulating maternal responsive involvement in large social networks. A large social network may not only provide parents with social support and information but may also enable them to discuss new information more frequently and to mirror new ways of caregiving in overcoming feelings of insecurity.

In sum, parent education can change maternal responsive behavior toward the infant. Replication of the study in other samples is necessary to establish the validity and generalizability of this remarkable result more definitely (van IJzendoorn, 1988; van IJzendoorn & Hubbard, in press). Written information appears to be more effective in stimulating responsive involvement, compared to videotaped information, especially in large social networks. Concrete but irrelevant details of videotaped models of mother-infant interaction seem to distract parents from essential aspects of the information. If part of parent education programs, videotaped instruction should be used more cautiously. We think that videotaped instruction may be more effective if used within a more structured context (e.g., discussion groups) in which there is ample opportunity to direct parents' attention to the more abstract information.

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