Infant/Parent Interaction: Studies and Intervention Guidelines Based on the SIAI Model

Jeanette A. McCollum
Vicki D. Stayton

Social interactions between caregiver and infant provide the interpersonal context for the infant's development. However, research indicates that the prelinguistic communicative characteristics of infants with handicaps may differ from those of handicapped infants in ways which interfere with the ease with which pleasurable interactions are established. Intervention directed toward facilitating such interactions should therefore be a major component of any 0-3 program, and a number of models have been outlined for this purpose. One of these, the SIAI (McCollum, 1983) has recently been tested through a series of single subject research studies (McCollum, 1984; Stayton, 1984). The present paper illustrates the variety of ways in which the model was used in these studies, and draws from them a number of practical intervention guidelines gleaned both from the results of the studies and from the experiences of the interventionists who implemented the studies.

■ Social interactions between caregiver and infant provide the interpersonal context for the infant's language, cognitive, and social development (Bruner, 1975; Schaffer, 1977; Stern, Beebe, Jaffe, & Bennett, 1977). The ability of both mother and infant to initiate interaction and to respond to and attach meaning to the behavior of the other appears to be crucial in establishing the interactive process; to the extent that these occur, interaction can develop in a positive manner, facilitating mutual satisfaction and the infant's development (Ratner & Bruner, 1977; Stern, et al., 1977). However, research indicates that the prelinguistic communicative characteristics (e.g., patterning of vocalizations, intensity of smiles) of infants with handicaps may differ from those of nonhandicapped infants in ways which interfere with the ease with which pleasurable interactions are established (Als, 1982; Emde, Katz, & Thorpe, 1978; Jones, 1977). If the caregiver is unable to read the interactive cues of the infant or to adapt his or her own interaction patterns to the unique capabilities of the infant, social interaction may be neither mutually rewarding nor supportive of the infant's development. Intervention directed toward social interaction should be a component of any 0-3 intervention program (Bromwich, 1981). Such intervention can be very successful in helping caregivers adjust their own interactive characteristics to better match those of their babies (Field, 1982; Fraiberg, 1974; McCollum, 1984).

A variety of types of intervention have been used for this purpose. The model on

This research was supported by Special Education Programs, Office of Special Education and Rehabilitation Services, U.S. Department of Education, Grant #G008001795. The authors wish to thank Developmental Services Center, Champaign, IL, for referral of families. Special thanks go to Laurel Bushman, Kim Spengel, and Leslie Larson for their help in implementing the project.

which this paper is based, the Social Interaction Assessment/Intervention (SIAI) model (McCollum, 1983), is one of the few which outline systematic steps to be followed by interventionists. This model seems particularly useful because it mirrors intervention practices already used in infant programs, including assessment of needs, development of intervention goals based on the assessment, application of intervention procedures, ongoing data collection, and evaluation of progress.

The SIAI has been used in a series of single-subject studies and has led to changes in a variety of interactive behaviors in mothers and babies. Results of three of these studies are reported in McCollum (1984). The purpose of the present paper is to demonstrate how the model is used and to outline practical guidelines drawn both from the research studies and from the experience of the interventionists who implemented the studies.

The following sections will first describe the model and its underlying assumptions and then present in detail the procedures as they were applied with one dyad (Stayton, 1984). Results for three additional dyads will also be summarized (McCollum, 1984). Implications for interventionists will then be outlined.

THE SIAI: ASSUMPTIONS AND APPLICATIONS

Social intervention represents a complex and constantly changing interweaving of interactive behaviors of two unique individuals. Hence, no single parent training "lesson" can match the interactive capabilities and needs of all dyads. Instead, intervention must be based on an assessment of the typical interactive patterns of each individual dyad at any particular point in the infant's development. The fit between caregiver and baby is the ultimate focus of intervention; however, it is the adult member of the dyad who consciously can alter different aspects of his or her own interactive behavior. The approach taken in the SIAI model is therefore aimed at helping caregivers adjust interactive styles to the particular interactive characteristics of their babies.

Several general assumptions underlie and are reflected in the specific assessment and intervention steps. The first assumption is that changing the interactive behaviors of one member of a dyad will bring about change in the other. Second, because the baby's interactive characteristics and purposes will change as he develops, the caregiver will also be faced with the need to make periodic readjustments. Hence, a major goal is to increase the caregiver's ability to make these adjustments independently. One component directed toward this goal is the emphasis on problem-solving. A second way of approaching this goal is to make it clear that there are no "right" or "wrong" answers: Relationships between behaviors of the two members of the dyad are always conceptualized as hypotheses to be explored and tested as the caregiver engages in interactions with the baby. A third assumption is that intervention should result immediately in interactions which are easier and more fun. Behaviors chosen as initial intervention targets are therefore selected from social behaviors already within the repertoires of the two members of the dyad. Finally, since the model is based on the belief that new interactive behaviors can be acquired only if they are clearly understood by the caregiver and then practiced under non-threatening conditions, components of the model are designed to meet these criteria.

Procedures

The SIAI has two stages, assessment and intervention, each containing a series of steps and each based on the use of videotaped interactions. These steps are summarized in Table 1. Steps in the assessment portion of the table are limited to Level II (see below), since this is the one used in the intervention studies on which this paper is based.

Assessment. The assessment stage of the model as originally outlined (McCollum, 1983) contains two levels of assessment to be used either separately or in sequence. Each is aimed at focusing the interventionist's attention on two aspects of the interaction: the modalities used by each partner (e.g., touching, vocal behavior) and different aspects of interactive patterning (e.g., speed, intensity, rhythm). In Level I, the interventionist uses a scale to rate the dyad's interactions on each of these two components. The results are then used to generate hypotheses about

TABLE I
Teaching Steps from the SIAI Model*

Assessment Procedure (Level II)

A. Getting ready
   - choose 1-2 types of situations to videotape
   - videotape each situation, allowing about 4 minutes per situation

B. View videotapes, using discussion and problem solving
C. Select target for child: What do you want him to do more of?
D. Select target for adult, hypothesizing about its relationship to the child's target

   The best targets are: present but of low occurrence, simple to see on videotape, easy to practice, meaningful to the adult

E. Select which situation will be the intervention situation

Intervention Procedure

A. Getting ready
   - decide how many sessions there will be
   - decide where intervention will occur
   - decide which components of the model will be included

B. Components/Steps of Intervention Sessions
   - mother and interviewer watch tape and identify examples of the behavior when they occur
   - intervener reinforces the behaviors
   - intervener demonstrates with the baby
   - caregiver practices with the baby
   - mother and intervener discuss how mother can practice in everyday situations

*Summarized from McCollum, 1983.

relationships between behaviors of the two members. In contrast, in Level II this relationship between interactive behaviors is hypothesized without the aid of a rating scale, relying instead solely on clinical judgment.

As seen in Table 1, the first step of the assessment process used in Level II is to identify in general terms some social behavior of concern in the baby. This should stem from the interventionist's experience with the dyad and from concerns expressed by the caregiver. The type of interactive situation in which this behavior may be of particular concern is also identified. For example, the intervener might have noted that Baby B rarely smiles or laughs during face to face social play with her father, or that diaper changing times are periods of stress for Baby K and his mother, with K either crying or looking anywhere but at his mother's face.

The next step is to videotape the dyad several times in the identified interactive situation. From a careful viewing of these tapes, it is usually possible to identify a caregiver behavior that seems to have some effect on the behavior of concern in the baby. We might note, for example, that Baby B seems more responsive and "smiley" when the father makes funny faces. The assessment stage thus yields specific intervention targets for baby and caregiver. It also provides a baseline measure of their occurrence and relationship. Hence, the goal of the assessment stage is first to choose a behavior change target for the baby, and then to select a caregiver behavior which seems to influence whether or not the baby's targeted behavior occurs. Since the baby's target is an indirect one, the successful assessment is one yielding two behaviors, one for the baby and one for the mother, which are in fact related to each other in the manner hypothesized.

In the cases in which the model has been tested using a single-subject research design, mother/infant pairs were referred to the research project by professionals already ac-

quainted with the dyads. After an initial visit to establish rapport and informally observe the dyad, baseline videotapes were made once a week in the home for 3-5 weeks, with the exact number depending on the complexity and stability of the behaviors being looked at and on the logistics of scheduling. There was also a conscious attempt to vary the number of baseline sessions in order to evaluate how many were actually necessary for the assessment process. Visits occurred at weekly intervals (with one exception) because this is an interval used in many birth-3 intervention programs. A week was also felt to be of sufficient length to allow the mother time to practice the target behavior, but not so long that she might become frustrated if things didn't work out as planned.

Selection of target behaviors for each mother/baby dyad was based on discussion between the professional who referred the dyad and had knowledge of the mother's concerns, the coordinator of the research project, and a graduate student in early childhood special education. The latter served as the interventionist for that dyad. A different student worked with each dyad.

Table 2 presents a summary of dyad characteristics and targets selected through the assessment procedure. A conscious attempt was made to select dyads representing a range of characteristics and interaction needs in order to test the model under different conditions.

Intervention. The SIAI was designed to be flexible enough for use in a variety of intervention settings. For the purposes of validating the model, however, steps were implemented as outlined. At each intervention session, the procedure thus followed the steps shown in Table 1. First, the videotape made at the previous visit was viewed by mother and intervener together. The two then discussed several examples (from the tape) in which the mother displayed (or approximated) the target behavior. These instances were verbally reinforced by the intervener, who also pointed out instances in which the baby had responded with the corresponding target. The mother was then encouraged independently to identify further examples of her own target, as well as instances where it *could* have been used with good effect. If the baby was amenable, the intervener then briefly demonstrated the mother's target with the baby. This was followed by a short practice session by the mother, with facilitating comments from the intervener. There was then a brief discussion of everyday situations in which the mother might be able to practice the target behavior during the coming week. Finally, the dyad was again videotaped in the same situation in order to have a new tape available for the next session. All sessions were conducted in the dyads' homes.

For all dyads, the design used was single subject with a multiple baseline across the two mother behaviors. However, situations chosen for assessment and intervention differed somewhat, reflecting the needs of each dyad. Variations in design were also included in order to evaluate the effects of different conditions and outcomes. All intervention situations were 4-minute play interactions, either with or without toys. However, in two dyads, baseline was continued for five sessions, while in the other two it ended after three. In two dyads, both toy and no-toy situations were videotaped; one (no-toy play) was used as the intervention situation while the other (toy play) was used for collecting data to determine whether or not there was generalization across situations. In the third dyad, only a no-toy play situation was used, while in the fourth, toy play was the only situation used. Consecutive intervention phases for the mother's two targets lasted 3-5 weeks each (5 weeks for 3 of the total of 8 mother targets and 3 weeks for the others), with sessions occurring once per week. For two dyads, follow-up videotapes were made several weeks (at 9 weeks for one dyad and 3 for the other) past the last intervention session in order to assess maintenance of any changes in the mothers' or babies' targets.

Data collection was based on coding the videotapes, with the type of observational procedure used being chosen to reflect the particular target behaviors for each dyad. For example, in Dyad J, behaviors were coded in 10-second intervals, while in Dyads K and T, 5-second intervals were used. Reliability was established on occurrences only, dividing agreements by agreements plus disagreements. Videotapes were viewed once through for each target behavior, and results were graphed across sessions for visual analysis.

TABLE II
Dyad Characteristics and Sample Intervention Targets

*Dyad**	*Dyad Characteristics*		*Intervention Targets*	
	Child	*Mother*	*Child*	*Mother*
"J"	• 18-month-old boy, severe CP, DA approximately 3-4 months	• single parent, 3 children, lower-middle income, mid 30's in age	• vocalization	• moving face close to child's in playful manner (Phase 1) • imitating child's vocalization (Phase 2)
"K"	• 34-month-old girl, twin, no language, limited toy-play schemas (e.g., mouthing), little social awareness, neutral/fussy affect, DA approx. 18 months	• 2-parent family, 4 children, middle income, late 20's in age	• vocalization and appropriate actions with objects	• turntaking (Phase 1) • playfulness (Phase 2)
"T"	• 2-month-old girl, normally developing, but lack of vocal behavior in baby and "flat" interactions with mom	• 2-parent family, 1 child, university students, early 20's in age	• vocalization	• animated facial expression (Phase 1) • imitating child's vocalization (Phase 2)
"S"	• 21-month-old girl, severe cerebral palsy, limited vision, DA approximately 3 months	• 2-parent family, 1 child, lower-middle income, mid 20's in age	• look at mom's face	• position baby face to face (Phase 1) • play social games, e.g., Patty Cake (Phase 2)

*Results for the first three dyads are presented in detail in McCollum (1984); the fourth is the one whose results are shown in Figure 1 of this paper.

Results

Procedures and results for one dyad (Stayton, 1984) will be presented in detail below in order to provide an example of how the model is used for decision-making. A more general summary of results for the three other dyads (McCollum, 1984) will be given first in order to provide a more varied picture of the model's possible applications.

Summary of Results for Three Dyads. Each of the target behaviors chosen for these three mothers demonstrated either a change in level between baseline and intervention or a continuing upward trend during the intervention phase. For each mother, changes in the first intervention target were also maintained into the second intervention phase and (for both targets) into follow-up sessions. The two targets for each mother were not, however, necessarily equally responsive to intervention. In the two dyads for whom two types of situations were videotaped, there was little or no generalization from No-toy play to Toy play.

In each of the three dyads, target behaviors for the babies responded to the changes in the mother's behavior, showing either a change in level which was maintained across intervention phases, or a continuing upward trend across the two phases. These changes were also maintained in follow-up sessions. For the one baby for whom two targets were chosen (Dyad K), however, only one (vocalization) responded to changes in the mother's target, while the other remained at the same level as during baseline.

Procedures and Results for Dyad S. As shown in Figure 1, the four phases of the study for Dyad S included (a) five baseline sessions, (b) three intervention sessions with Target A, (c) four intervention sessions with Target B, and (d) a follow-up session four weeks after the final intervention session (session 13).

Baseline data were collected during five separate home visits over a three-week period. During each visit, the dyad was videotaped in two different situations: (a) a No-toy play situation, and (b) a Toy play situation. Each situation was videotaped for four minutes. No specific goal was given to the mother for either situation other than to play with her child as she usually did. The baseline tape was used to identify three dependent variables, including one infant and two maternal target behaviors.

Gazing at the mother's face was already present in the infant's repertoire, but rarely occurred. This behavior was selected as the target for the infant primarily because it is a socially appropriate behavior and is a powerful reinforcer of the mother's interactive attempts. Two maternal interactive behaviors that seemed particularly related to the level at which the baby did look at her mom were (a) positioning of the infant in a face-to-face position, and (b) the mom's use of conventional social games such as pat-a-cake. Thus, the baseline tapes made during the assessment stage indicated that while the infant seemed to look at her mother more under certain conditions, the mother rarely provided these conditions. Positioning the infant seemed especially crucial since the infant was physically impaired. Infant gaze at the mother was almost impossible to achieve unless the mother placed her exactly face to face. It was also noted during baseline that while the mother used conventional games, she often terminated them while the infant's responses, including gaze, were increasing in intensity. Upon termination of the game, the infant seemed to withdraw from the interaction.

The No-toy play situation was selected as the focus for intervention, as it was the one in which the targets chosen could occur most spontaneously. Although both play situations were videotaped during all phases of the study, only the No-toy play situation was used for intervention and data collection, primarily because the selected targets were less appropriate during Toy-play. It was, however, useful to have a baseline measure of the Toy-play situation available for the assessment phase.

Intervention was conducted in the dyad's home every two weeks for seven sessions; a 2-week interval was chosen because the dyad was already being visited on alternate weeks by another interventionist. Three intervention sessions were implemented with Target A, the mother's positioning of the infant, and four sessions were conducted with Target B, the mother's use of conventional games. Each session lasted one to one and one-half hours.

A follow-up videotape was made four weeks after the last intervention sessions,

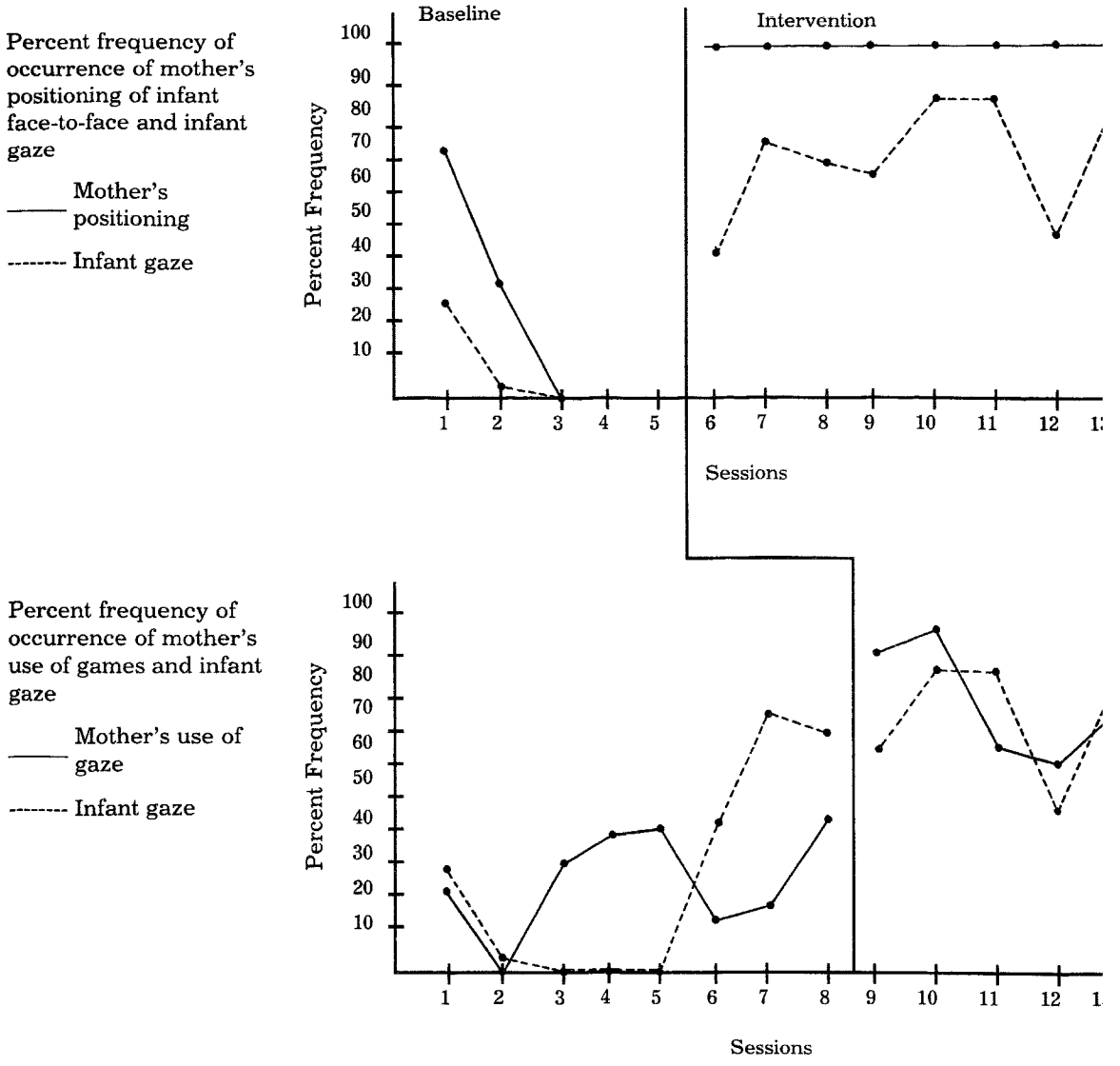

FIGURE 1
Results for Dyad S.

using the same four-minute play situation. No training occurred at this session.

Data collection was based on videotapes of the No-toy play situation made at the 13 sessions. Three minutes of each situation were coded as a data base. The five initial sessions provided baseline data for Target A, while the first eight sessions served as baseline for Target B. Sessions six through eight provided data for intervention into Target A, while sessions nine through twelve provided intervention results for Target B. The follow-up videotape, Session 13, was analyzed to determine if intervention effects were maintained.

Data were coded from the videotapes separately for each dependent variable, utilizing a MORE, an electronic data collection system which was developed at the University of Washington. For each session, each behavior was coded continuously (either present or absent) for 180 seconds. Each dependent

variable was thus represented as the total number of seconds accounted for by each code in each situation.

The three dependent variations were defined as follows:

1. Mother's positioning of infant face-to-face: This behavior was coded when the infant was facing the mother and was positioned in such a way as to maximally normalize muscle tone and to facilitate the mother's manipulation of the infant's body in social interaction. For example, one position was to place the infant in a sitting position between the mother's legs with the infant's spine and head supported with a pillow.
2. Mother's use of conventional games: This behavior was recorded when the mother used social games such as pat-a-cake, peek-a-boo, and head thinker.
3. Infant gaze: This behavior was coded when the infant looked at/toward the mother's face.

The researcher trained two other persons to code the videotaped situations. Intercoder reliability was established by coding videotaped situations of other dyads engaged in play. Agreement was scored when two observers used the same code (behavior either present or absent) in a given one-second interval, plus or minus one second. Initial reliability, defined as the number of agreements divided by the sum of agreements and disagreements, was .927. Interobserver reliability checks were also made by randomly selecting and coding a tape from the first seven sessions and another tape from the final six sessions. Reliability averaged .939 for maternal behaviors and .844 for the infant behavior. Intracoder reliability was calculated in the same manner. Initial intracoder reliability was .937, and averaged .97 for maternal behaviors and .933 for the infant behavior for ongoing reliability.

The percent frequency of each dependent variable during each 180-second session was calculated by dividing the total number of one-second intervals in which the behavior occurred by the total number of intervals (180). These data were then charted across sessions in order to address the question of whether intervention resulted in changes in the targeted behavior.

Results for Target A, the mother's positioning of the infant, are represented in Figure 1-a. The baseline shows a decreasing trend from session one to three, becoming stable at 0% for the remainder of the baseline period. With the introduction of intervention, the overall occurrence of Target A changed from 0% to 100%. This target remained at 100% across both intervention phases and was maintained in the follow-up session.

Results for Target B, the mother's use of conventional games, are shown in Figure 1-b. Overall occurrence was relatively erratic during the eight session baseline period, with the percent frequency ranging from 0% to 40%. The overall frequency increased during the intervention phase, with frequencies ranging from 56% to 87%, and this increase was present in the follow-up session at 70%. A decreasing trend was evident during sessions 10, 11, and 12 of the intervention phase. However, the trend appeared to be stabilizing for intervention sessions 11 and 12 and the follow-up session, with overall frequencies remaining higher than those in the baseline phase.

Figure 1 indicates that the infant's gaze at her mother decreased from session one to session three and became stable at 0% for the remainder of the baseline phase. The overall frequency of the infant's gaze did increase with the introduction of the first intervention, with an upward shift in level indicated between baseline and the first intervention, and a slight downward shift between the two intervention phases. However, a steady upward trend was evident across both intervention phases and the follow-up session.

Overall, intervention appeared to be more effective with Target A, probably because it was easy for the mother to implement, representing an "all or nothing" type of behavior. However, intervention was necessary before the mother became aware of the importance of positioning and did it without prompting. Target B, the mother's use of conventional games, also increased in overall frequency between baseline and intervention, with a large upward shift of level (from 40% to 87%). For the rest of the intervention phase and into maintenance, the mother used this behavior at a more moderate level, which nevertheless remained higher than during baseline. This pattern is analagous to that

described by McCollum (1984), in which the initial intervention session resulted in higher levels of the target behavior than the later sessions, and may indicate heightened attention to a behavior at the introduction of intervention, with the behavior becoming more stable as it becomes more familiar. Further, it is possible that an overall frequency of occurrence ranging from 56% to 70% of a three minute interactive situation is a more realistic expectation than frequencies ranging from 87% to 96%. Thus, this mother's more moderate use of social games may reflect a more optimal level.

The baby's gaze at the mother increased in overall frequency during intervention and was maintained during the follow-up session. Results indicated that the infant's gaze was directly related to positioning. In fact, the infant never looked at her mother except when she was placed in a face-to-face position. It seems evident that prior to intervention the mother limited social interaction by not providing an appropriate situation where interaction could occur.

The relationship between Target B and the infant's gaze is not clear from an examination of infant gaze alone. However, if one looks at the parallel relationship *between* the behaviors, as shown in Figure 1-b, it can be seen that in three of the five sessions (intervention and follow-up) maternal changes in the use of games were associated with changes in infant gaze. It should be noted that during the first intervention session, the infant had just recovered from an illness that had lasted seven days; therefore, the decreased overall frequency and lack of parallel relationship for session nine may reflect reduced attention behaviors due to the illness.

IMPLICATIONS AND GUIDELINES

Results of the studies summarized above indicate that using the procedures outlined in the SIAI can result in changes in the interactive capabilities of mothers in at least two types of situations, with babies differing widely in age and characteristics, and with a variety of intervention targets. The model also proved to be one which could be implemented successfully by interventionists with much less experience with parents than most individuals working in parent/infant intervention programs. The results also lend support to the assumptions on which the model is based. It was found that relationships between baby and mother behaviors could be identified using a combination of clinical judgment and careful coding and graphing of interactive behaviors. Further, changes in the mother's behavior acted as an intervention which brought about changes in the baby.

The series of steps in the SIAI provide a way to systematize intervention that results in change in dyadic interactions. The steps do not, however, take the place of clinical judgment. In the view of the interventionists who implemented these studies, decisions made at each step involved a consideration of the entire context in which interactions occurred. Careful observation, ongoing communication, open-mindedness and flexibility were felt to be key ingredients in achieving success. A hypothesis orientation, with parent and interventionist as the problem solving team, seemed to provide the mind set most likely to result in these ingredients being present. Throughout the assessment and intervention process, it was important to keep in mind that the parent was the primary change agent in relation to the infant's behavior. The parents' goals for interaction had to be considered, with communication channels remaining open in order to maximize the parents' participation in decision-making.

In addition to the feeling that the overall problem-solving orientation of the model "worked," the experience gained from implementing the procedures also led to a number of more specific observations which may be useful to others wishing to use the SIAI. These are summarized below for each stage separately.

Assessment

The interventionists in these studies found that appropriate targets could be chosen after direct observation of several interactive sessions; the same was true for the types of situations in which problem interactions typically occurred and which therefore became the situations for intervention. Three baseline videotapes seemed to be the minimum needed to obtain a good picture of the hypothesized target behaviors. Unless some

particular behavior showed a very erratic pattern, three sessions would also provide an adequate base against which to compare data taken during the intervention phase. In those dyads in which additional baseline sessions were taped, little new information was added that was relevant from an assessment point of view. From the mothers' point of view, even three were often too many: They were anxious to get started.

Informal observation of the parent and baby in a variety of situations in the home setting prior to videotaping was very useful. Observations of and discussions with the parent facilitated the selection of appropriate situations for videotaping and making initial hypotheses about targets. In some cases, informal observation indicated the need to videotape the dyad in two or three different situations. Comparison of these tapes, as well as analysis of the data from each, were useful for choosing the most appropriate situation for intervention.

Targets selected should be behaviors that are important and meaningful to the parent. If making "exaggerated faces" seems silly to the mother, for example, she is unlikely to practice it regardless of its potential influence on the baby. In addition, selected targets should be behaviors that can be practiced easily within the normal daily routine. It is probably best to target only one behavior at a time in order to eliminate any chance of interference, and behaviors which are easier to change should be subject to intervention first. The interventionist should remain flexible and willing to change targets if necessary, since once intervention begins, it may be found that some behaviors are difficult to change or that inappropriate targets have been selected.

Intervention. The number of intervention sessions for any one dyad should be dependent on the behaviors selected. For example, positioning the baby in a different way is much easier to learn than is responding to a baby's look with an "exaggerated face." Three to five sessions were used for each of the dyads reported here. Adequate sessions must be provided to allow for acquisition of the behavior, yet the interventionist should be aware that too many sessions, even for more difficult behaviors, may result in boredom or frustration. One solution may be to move on to another target, returning later to the earlier target if it is still an area of concern.

The actual intervention components to be included (e.g., watching the tape, practicing the behavior) may also be affected by the uniqueness of each dyad. Studies done with the model thus far have used all of the components; it is not yet known which of these are critical for bringing about change. It was found, however, that different mothers responded differently to the components. For example, one mother seemed particularly threatened by watching the interventionist model the targeted behavior; for her, it might have been beneficial to eliminate this part of the instruction. Although modifications may be necessary, it should be emphasized that as many components as possible should be retained since each step serves a function in identifying/defining, acquiring, and reinforcing targets.

Another consideration in planning intervention is that of generalization to other situations. In the two dyads for whom two types of situations were videotaped, generalization from no-toy to toy situations was minimal. Hence, it seems essential to include practice in several situations in which the behavior may be important, with feedback provided for the parent. In one of the dyads, a method which seemed effective in increasing the amount of transfer was simply to discuss with the mother examples of how the target behavior could be used at different points in the household routine.

Analysis of the data during the actual intervention process was essential for determining if progress was being made and if the target behaviors were in fact related to each other. If a criterion for learning were set, data checks could also indicate when the interventionist could move to another behavior.

SUMMARY

While babies with delays or disabilities may have unique and often frustrating interactive capabilities, research indicates that caregivers can learn to alter their own interactions to better match those of their babies. The importance of social interaction to the babies' development makes this a critical focus for intervention. This paper reviewed

one model which provides a systematic way of approaching intervention into social interaction, presented illustrative data, and offered a series of suggestions derived from the experiences of interventionists who have used the model.

REFERENCES

Als, H. (1982). The unfolding of behavioral organization in the face of a biological violation. In E. Z. Tronick (Ed.), *Social interchange in infancy: Affect, cognition and communication* (pp. 125-160). Baltimore: University Park Press.

Bromwich, R. (1981). *Working with parents and infants: An interactional approach.* Baltimore: University Park Press.

Bruner, J. (1975). The ontogenesis of speech acts. *Journal of Child Language, 2,* 1-19.

Bushman, L. A. (1981). *Parent-infant interactions and the handicapped infant: An intervention study.* Unpublished master's thesis, University of Illinois, Champaign.

Emde, R. N., Katz, E. L., & Thorpe, J. K. (1978). Emotional expression in infancy: II. Early deviations in Down's Syndrome. In M. Lewis & L. A. Rosenblum (Eds.), *The development of affect* (pp. 351-360). New York: Plenum Press.

Field, T. (1982). Interaction coaching for high-risk infants and their parents. *Prevention in human services* (pp. 5-24). New York: The Haworth Press.

Fraiberg, S. (1974). Blind infants and their mothers: An examination of the sign system. In M. Lewis & L. A. Rosenblum (Eds.), *The effect of the infant on its caregiver* (pp. 215-232). New York: Wiley and Sons.

Jones, O. H. M. (1977). Mother-child communication with pre-linguistic Down's Syndrome and normal infants. In H. R. Schaffer (Ed.), *Studies in Mother-infant interaction* (pp. 379-401). New York: Academic Press.

McCollum, J. A. (1983). *The development of behavioral synchrony in social communication: The exceptional infant.* (Grant #G008001795). Washington, DC: Special Education Programs, U.S. Office of Education.

McCollum, J. A. (1984). Social interaction between parents and babies: Validation of an intervention model. *Child: Care, Health and Development, 10,* 301-315.

Ratner, N., & Bruner, J. (1977). Games, social exchange and the acquisition of language. *Journal of Child Language, 5,* 391-401.

Schaffer, H. R. (1977). Early interactive development. In H. R. Schaffer (Ed.), *Studies in mother-infant interaction* (pp. 3-16). London: Academic Press.

Stayton, V. (1984). *Social interaction intervention with a mother-handicapped infant dyad.* Unpublished master's thesis, University of Illinois, Champaign.

Stern, D. N., Beebe, B., Jaffe, J., & Bennett, S. L. (1977). The infant's stimulus world during social interaction: A study of caregiver behaviors with particular reference to repetition and timing. In H. R. Schaffer (Ed.), *Studies in mother-infant interaction* (pp. 177-202). London: Academic Press.

Jeanette McCollum is an Associate Professor in Special Education at the University of Illinois, Urbana-Champaign, where **Vickie D. Stayton** is a doctoral candidate.