DOCUMENT RESUME

ED 214 349 EC 141 568

AUTHOR Walker, Jeanette A.; Kershman, Susan M.
TITLE Deaf-Blind Babies in Social Interaction: Questions of Maternal Adaptation.
PUB DATE Apr 81
NOTE 41p.; Paper presented at the Bi-Annual Meeting of the Society for Research in Child Development (Boston, MA, April 2-5, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Affective Behavior; *Deaf Blind; *Interaction; Mothers; *Parent Child Relationship; Social Development; Young Children

ABSTRACT

Patterns of social interaction were compared between four deaf blind children (3 to 5 years old) and their mothers and a matched group of four normal children (1 month to 19 months old) and their mothers in terms of amount of interaction, modalities used, affective quality, and contingent response patterns. Videotaped home interactions were coded according to the modalities in which interactions took place. Both quantitative and qualitative differences were found between the social interaction patterns of the normal and deaf blind Ss. The two groups tended not only to respond to different categories of behaviors, but also with different categories. Normal Ss were more likely to respond than deaf blind Ss and were more predictable in their interactive responses and in their affect. Deaf blind Ss were less responsive, less predictable, and generally less interactive. The two groups of mothers differed in their overall use of change and repetition. Mothers of deaf blind Ss used kinesthetic responses proportionately more and the verbal/vocal category less, and were less active overall than were mothers of normal Ss. However, in relation to their children, mothers of deaf blind Ss were proportionately more active, engaging in twice as many interactive behaviors as the children. The complex nature of interactions is stressed, as is the difficulty of interpreting differences between populations of dyads. (CL)

Deaf-Blind Babies in Social Interaction: Questions of Maternal Adaptation

Jeanette A. Walker, Ph.D.
Department of Special Education
University of Illinois

Susan M. Kershman, Ph.D.
Department of Special Education
Temple University

The social interactive process during the first three years of life is based on a meshing of individual patterns of behavior, and on the changing roles assumed by each interactor over time. The establishment of normal patterns of interaction is at least partially dependent on the normal capabilities and responses of the infant. It might be expected that extreme differences in intra-individual characteristics, such as those which may be associated with handicapping conditions, would be related to differences in interaction patterns as well. Further, one might expect that such patterns would be influenced not only by the child's characteristics and behavior patterns, but by the parent's perceptions of the child's ability to engage in social interaction, by the past history of the relationship, and by how much satisfaction the parent experiences in social interaction with the child.

Social interaction implies the adjustment of each partner to the characteristics and behaviors of the other. When one partner is a baby, the mother is responsible for most of the adjustment which occurs. When the baby is severely handicapped, as in the present study, one might assume that even more of the responsibility for adjustment would rest with the mother.

If it can be assumed that, given a normal baby, the characteristics shown by the mothers of the deaf-blind babies in this study would be

Deaf-Blind Babies in Social Interaction: Questions of Maternal Adaptation

Jeanette A. Walker, Ph.D.
Department of Special Education
University of Illinois

Susan M. Kershman, Ph.D.
Department of Special Education
Temple University

The social interactive process during the first three years of life is based on a meshing of individual patterns of behavior, and on the changing roles assumed by each interactor over time. The establishment of normal patterns of interaction is at least partially dependent on the normal capabilities and responses of the infant. It might be expected that extreme differences in intra-individual characteristics, such as those which may be associated with handicapping conditions, would be related to differences in interaction patterns as well. Further, one might expect that such patterns would be influenced not only by the child's characteristics and behavior patterns, but by the parent's perceptions of the child's ability to engage in social interaction, by the past history of the relationship, and by how much satisfaction the parent experiences in social interaction with the child.

Social interaction implies the adjustment of each partner to the characteristics and behaviors of the other. When one partner is a baby, the mother is responsible for most of the adjustment which occurs. When the baby is severely handicapped, as in the present study, one might assume that even more of the responsibility for adjustment would rest with the mother.

If it can be assumed that, given a normal baby, the characteristics shown by the mothers of the deaf-blind babies in this study would be similar to those displayed by the mothers of the nonhandicapped babies, then the ways in which these mothers differ may be viewed as occurring in response to the characteristics of the deaf-blind baby. Further, these differences may indicate either adjustment or non-adjustment (e.g., disorganization, display of behaviors unrelated to the interactive partner, etc.). If the former is assumed, i.e., that differences are adjustments to the characteristics of the deaf-blind babies as interactive partners, it must still be determined whether these adjustments are adaptive ones. And questions of adaptation must be accompanied by the question, "Adaptive for what?" Furthermore, many adjustments may be logically interpreted as either adaptive and/or non-adaptive, depending on the answer to that question in that particular case, making this a very complex issue.

The purpose of the present study was to compare patterns of social interaction between a group of four deaf-blind babies and their mothers to those of a matched group of four normal babies and their mothers in terms of amount of interaction, modalities used, affective quality, and contingent response patterns. Particular attention was given to possible adaptive functions that differences between mothers might play in relation to differences found between the two groups of babies. While it is recognized that causal links can not be established from the present data, such an approach allows the examination of mother differences as adjustments to baby differences; further speculation then becomes possible in terms of the adaptive and non-adaptive qualities of these adjustments.

It was predicted that the deaf-blind babies' behavior would be both more limited in variety and less predictable in terms of the parents' being able to anticipate what the infant would respond to. Each of these types of differences would have implications for the mothers' ability to adapt, for they would define a social partner who would be outside of the mothers' experience with, and expectations for, social communication. It was also predicted, however, that social communication would occur despite the limitations of the babies, albeit in alternative ways, displaying different characteristic patterns than in the normal baby-parent dyads.

Subjects

The sample for this study was composed of four parent-child dyads in which the child was classified as functionally deaf-blind, and four dyads in which the child was nonhandicapped. The handicapped children were selected on the basis of their participation in an intervention program for young deaf-blind children. Three were boys and one a girl; these four babies ranged in developmental age from 1 month to 20 months, with three of the babies being in the 1-2 month range. Chronological ages ranged from 3.0-5.4 years, with three of the babies being under 3.11. Two of the babies were black and two caucasian.

The group of normal babies were recruited from a daycare center, and were chosen to participate in the study on the basis of similarity to one of the handicapped children on the variables of developmental level, sex, race, socioeconomic status of the family, and the education of both parents. Chronological age was not used as one of the matching variables. The normal babies were therefore chronologically younger than the deaf-blind babies, ranging in age from 1.6 months to 19 months.

Procedure

An initial visit was made to each home to accustom the family to having an observer present. A second visit was then made for videotaping the daily activities of feeding, bathing and play. No structure was put on these sessions; rather, the person videotaping the sessions adapted to the family's normal routine, with this exception; if one of the situations was not naturally engaged in, the videotaper reminded the mother to go ahead and carry out that activity as she normally would. Five minutes of the play sessions, beginning 30 seconds into the session, were used as the data base for the present study; the total data base used in the analyses was therefore derived from 20 minutes of interaction for each group of dyads.

Behavioral codes focused on modalities in which interactions took place. Parent codes included (a) gaze (looking at the baby's face), (b) vocal-verbal, (c) tactile (touching or kissing), (d) kinesthetic (movement of the baby's limbs or body in space), and (e) do-nothing. Categories for baby behaviors were similar, and included (a) gaze, (b) vocal behaviors of a positive or neutral nature, (c) physical movement, (d) vocal behaviors indicating distress, and (e) do-nothing.

The coding procedure was event-based, with no regard for time, and categories were coded as being mutually exclusive. In cases where two categories occurred concurrently, the one which began first was coded; behaviors were thus coded simply as alternating sequences between mother and baby. Inter-observer agreement ranged from 88-96%.

Data from the group of four dyads with deaf-blind babies were compared to those for the group of dyads with nonhandicapped babies using procedures for the analysis of observational and/or proportional data (Fleiss, 1973; Gottman & Bakeman, 1979; Robson, 1973; and Siegel, 1956), including primarily the chi-square test for goodness-of-fit, the binomial z, and the z for testing differences between proportions. Because many of the frequencies for conditional relationships between mother and baby behaviors were small, analyses were performed only on these cells where particular cells or groups of cells met specific criteria. However, while the number of possible comparisons of contingent relationships was relatively small, visual comparisons of the interaction patterns of the two groups were often much more interesting than the statistical analyses.

Results

Because the purpose of this paper is to examine differences between the mothers of these two groups of babies in terms of their possible adaptive functions in relation to the differences between the babies, results from the babies and dyadic units will be presented first, followed by the results for the mothers. These will then be discussed in terms of their possible adaptive functions within the interactions.

As might be expected, both quantitative and qualitative differences were found between the social interaction patterns of the normal and the deaf-blind babies. Quantitatively, the overall rate of interaction was much

- - - - - - - - - - - - - - - - - -

Insert Table 1 about here

- - - - - - - - - - - - - - - - - -

less in the dyads with deaf-blind babies, as seen in Table 1; only about two thirds as many two-step interactive sequences occurred in these dyads as in the others. Furthermore, 50% of the time in which the mothers of the deaf-blind babies were engaged, the babies were not, in contrast to 11% for the nonhandicapped babies.

While recognizing that modalities may not be equal in communicative value, an examination of a combination of those behaviors which may be interpreted as communication by the mother may serve as a simple index to the baby's availability for interaction, while ignoring the quality of the interaction. A further look at the quantity of interactive behaviors shows that when distress was included as a possible communicative system, 50% of the deaf-blind babies' behaviors during the interactive sequences were available to serve as social interaction, in contrast to 89% for the normal babies. When distress was excluded as a communicative category and only positive categories were considered, 39% of the deaf-blind babies' behaviors were available for interaction, in contrast to 76% for the normal baby. Both of these differences were significant at a $p < .001$ level ($z_{tot} = -3.9$; $z_{pos} = -5.19$). Even if the mother were to interpret every one of the deaf-blind baby's behaviors as communication, her baby would still offer her much less chance to engage in or create interactive sequences.

Using the frequencies in the category profile of the nonhandicapped babies as what would theoretically be expected in the deaf-blind group if the two groups were drawn from the same population, it was found that the two groups of babies were also characterized by significantly different qualitative communication profiles in terms of the distribution of their behaviors across the five categories ($X^2 = 118.83$, $p < .001$, df=4). Each group also differed significantly from chance (n derived from $p = .20$) in the distribution of modality use across categories ($X^2_{db} = 25.54$; $X^2_{nhc} = 22.06$; $p < .001$, df=4). Category use was therefore not at a chance level for either group; the two groups, however, differed from each other in the modalities which best characterized their interactive styles.

In order to determine which particular categories might account for these differences, and to more precisely define the two groups of babies as interactive partners, a comparison was made of the two proportions for entries in each set of analogous cells of the category profiles across the two groups, as recommended by Suomi (1979). Two particular categories were found to differ significantly across groups, including vocalization ($z = -2.04$, $p < .05$) and do-nothing ($z = 2.69$, $p < .01$). Each cell for each group was also compared to a chance value ($p = .20$); using this type of analysis, the deaf-blind babies were found to exhibit significantly less vocalization ($z = -4.27$; $p < .001$), less distress ($z = 2.18$; $p < .05$), and more do-nothing ($z = 7.18$; $p < .001$) than would be expected by chance. The nonhandicapped babies also exhibited less do-nothing ($z = -2.0$, $p < .05$). In contrast to the deaf-blind babies, however, they exhibited more gaze ($z = 3.22$, $p < .01$), more vocalization ($z = 2.38$; $p < .05$) and less do-nothing ($z = -2.0$; $p < .05$). The normal babies were thus more likely to engage in vocalization and gaze, the two modalities probably most often involved in everyday social interaction, and familiar to the mothers as interactive categories. The deaf-blind babies used almost no vocalization, and had a much lower probability of engaging in gaze than did the normal babies; rather, they were most often engaged in doing nothing significantly more often than chance. Of those behaviors which the mothers might interpret as interactive, the one most used by the deaf-blind babies was movement, probably the least communicative of the modalities, at least in isolation. The two groups of babies were therefore very different in their overall characteristic communication profiles. ("Communicative" is loosely defined here as any possible mode of interaction; no implication of intentionality is assumed.)

While uncontingent behavior patterns such as those just described characterize the interactive partner in general, contingent patterns characterize the interactive partner in relation to the other member of the dyad, and have implications for both predictability and for the extent to which the behavior interchanges actually resemble social interaction. For example, a baby (or mother) may be extremely vocal, or may become vocal in the presence of another individual, but may exhibit none of this in direct relation to the interactive behaviors of the other. Further, even a baby who displays fewer behaviors in general, or displays behaviors which are largely in categories not usually thought of as communicative, may be a satisfying and enjoyable social partner if those behaviors are clearly related to the mother's own interactive efforts.

Because many of the cells in both matrices showing overall contingent category use (Table 1) contained low frequencies, no chi-square comparison of the total matrices containing conditional probabilities was made. However, it was possible to use the binomial z to compare the conditional probabilities in some of the individual cells to probabilities based on expected values derived from uncontingent probabilities in the row and column totals. That is, given a particular mother behavior (e.g., vocalization), what was the most probable baby response? Was it any more predictable than it would be simply from the baby's overall use of the categories, i.e., from the uncontingent probability? It was found that the contingent response patterns in neither group were significantly different from overall modality use, at least for those cells with high enough frequencies to be included in the analyses (7 and 10 comparisons for the deaf-blind and nonhandicapped groups respectively).

Despite the lack of significant differences for individual cells, however, it seems obvious that the contingent response patterns which the two groups of babies presented to their mothers were very different. A closer visual analysis of the matrices may be used to clarify these clinical patterns. Vocalization was the category most used by both groups of mothers, and one of the two modalities most likely to obtain a positive response in both groups. In the nonhandicapped group, mother vocalization was most likely to be followed by baby vocalization or gaze, while in the deaf-blind, group movement was the most probable reponse. The deaf-blind babies were almost equally responsive to the mothers' use of the kinesthetic category and to mother vocalization, while the nonhandicapped babies were much more responsive to mother vocalizaton. Consequently, of all the combinations of mother initiate/baby respond, the two most probable contingent patterns in the nonhandicapped group were mom gaze → baby gaze and mom vocal → baby vocal, while in the deaf-blind group they were mom vocal → baby move and mom kinesthetic → baby move. The two groups of babies therefore tended not only to respond to different categories, but to respond with different categories. In the deaf-blind group, in addition, the three mother initiation categories containing the majority of mother behaviors were each almost equally likely to be followed by a no response as by a response. The probability of obtaining any reponse from the deaf-blind babies therefore had a greater tendency to be closer to chance than with the nonhandicapped babies, indicating that the interactive behaviors which mothers directed toward their deaf-blind babies made less difference in terms of differential responding. The normal babies were not only more likely to respond, but to be more predictable in the types of responses which they would make to a particular parent behavior, often matching the behavior of their mothers.

Predictability is a crucial characteristic of any interactive partner; in babies, it allows the mother to anticipate and establish interactive sequences, and enables interactions to take place in chains of behavior which are longer than two steps. It has already been demonstrated that the deaf-blind babies were highly predictable in that the probability that they would do nothing was .50. Further, 73% of their total amount of interaction was accounted for by two categories (do-nothing and movement), while two categories (gaze and vocal) accounted for only 59% of the normal baby's behavior. The deaf-blind baby was thus more predictable overall, but in less interactive ways. When responses to specific parent behaviors were examined, however, the deaf-blind baby was also less predictable. Further, while the normal babies almost always responded, for the deaf-blind babies the probability of a response or a no response was almost equally likely in each case. In addition, movement, the most used interactive modality of the deaf-blind baby, was not differentiated according to specific parent categories. In terms of predictability, then, the mother of the deaf-blind baby would be less able to predict which of her behaviors would get a response, and given a response, would be less able to predict what it would be.

The results just presented not only describe category use by the babies; if one combines the three responsive modalities into one category called "positive," the same results may be used as one index to the overall affective quality of the baby as an interactor, and to the predictability of each affective state (+, -, or n) as presented to the mother. (A do-nothing has been re-defined here as neutral in order to differentiate it from positive and negative; in reality, a do-nothing may or may not be interpreted as neutral by the mother involved in the interaction.) This regrouping is given in Table 2, which displays the affective quality of the babies' contingent responses to each type of parent initiation, as well as the overall affective quality of each group of babies (category profiles).

A highly predictable affective response following any particular type of parent initiation is indicated by a high probability for one type of

---

Insert Table 2 about here

---

affective response (i.e., +, -, or n.), and low probabilities for the other two. Conversely, lower probabilities, or probabilities spread over more of the three possible affective response categories, would indicate a less affectively predictable baby. In congruence with the results already presented, a comparison of the two groups of babies in the distribution of responses across the three affective categories, using the results from the nonhandicapped group for expected values, yielded a significant difference between groups ($X^2 = 108.51$; $p < .001$; df = 2). In addition to differing from each other in the distribution of behviors across affective categories, each group of babies also differed from what might be expected by chance ($p = .33$) ($X^2_{db} = 22.54$, $p < .001$, df = 2; $X^2_{nhc} = 115.47$, $p < .001$, df =2). Responses of both groups were therefore more predictable than chance, although those of the nonhandicapped group were more so. A comparison of analogous cells of the column profiles of the two groups, using the z for comparison of proportions, showed that the two groups differed in the proportion of behaviors in both the positive ($z = 3.9$, $p < .001$) and the neutral ($z = 2.69$, $p < .01$) categories. Further, a comparison of each of the three affective categories for each group with chance ($p = .33$) showed that both groups displayed negative affect significantly less than chance ($z_{db} = -4.52$, $p < .001$; $Z_{nhc} = -4.98$, $p < .001$). However, the deaf-blind babies were also engaged in neutral affect significantly more often than chance ($z = 3.48$, $p < .001$), while the normal babies engaged in neutral affect significantly less than chance ($z = -5.51$, $p < .001$) and positive affect at a level significantly greater than chance ($z = 10.92$, $p < .001$). Thus, the two groups of babies both engaged in negative affect at a less than chance level. The deaf-blind babies, however, were best characterized by neutral affect (defined here as do-nothing), while the handicapped babies were best characterized by positive.

The regrouping of the five categories into three categories of baby affect also allows a slightly different interpretation of patterns of contingent responding. The combination of categories into more inclusive ones yielded cell frequencies of sufficient magnitude for applying a chi-square for comparison of the total matrices (although one cell of the 25 still contained a frequency of zero as the expected value). A chi-square performed to compare these total matrices yielded a significant difference ($X^2 = 134.3$, ($p < .001$, $df = 8$) between the two groups. The two groups of babies thus differed not only in their typical affective quality, as represented in the column totals, but in the distribution of their typical affective responses to particular mother categories of behavior.

The binomial z was used to determine if particular cells accounted for these differences. It was found that in neither group did any of the typical baby responses to the five mother categories differ significantly from what would be expected from the uncontingent probabilities in the row and column totals, at least for those comparisons with frequencies high enough to compute. Overall interactive characteristics were therefore mirrored in responses to particular mother behaviors, at least as reflected in terms of statistical differences.

Again, a visual analysis adds more information to the clinical picture of differences in patterns for the two groups. In general, a positive response was the most predictable one for the nonhandicapped babies to every mother category except do-nothing (which happened only four times for the total group). For each of the mother initiation categories of visual, vocal, tactile and kinesthetic, the normal babies had a very high probability of positive response. For the group of deaf-blind babies, a neutral (do-nothing) was the most predictable response to all mother categories except mother do-nothing (and gaze, which had very few entries). Following the kinesthetic initiation category, the probabilities of a positive response and a do-nothing response from the deaf-blind baby were almost equally likely; responses to vocal/verbal initiation showed the same dichotomy, although not to the same extreme. Response to tactile initiation was even less predictable; 48% of the time it elicited no response, and the remaining percentage was almost equally divided between positive and negative. A positive response was, however, the second most predictable response to the vocal, tactile and kinesthetic categories; if the do-nothing responses are disregarded, the deaf-blind babies showed more similarity to the nonhandicapped babies. While patterns of affective response in both groups were more predictable than chance, they were thus predictable in very different ways. The most likely affective response of the deaf-blind babies was, however, not as predictable as that of the nonhandicapped babies, either in general or in response to particular mother initiations.

Another approach taken to examine the predictability of the affective quality of the interactions was to compute the average number of intra- and inter-individual sequential behaviors with no change in affect; that is, given a particular affective state for either the baby or for the dyad, how long was it likely to last? It was found that both of these measures differed for the two groups. First, given any chain of behaviors, the affective quality most likely to be maintained by the deaf-blind baby was neutral, with a mean length of 2.12 coded behaviors, while for the normal baby it was positive, with a mean length of 6.33. The normal babies were not only more predictable in affect from one behavior to the next, as indicated by a longer mean length, but were predictable in much more socially interactive ways. While this difference was not statistically significant, probably due to the large standard deviations associated with the mean for the nonhandicapped group, its possible clinical significance for the mothers cannot be overlooked.

A similar approach was taken to characterizing the affective quality of the dyads (rather than the infants); a frequency count was made of the 2-step chains in which both the mother's and the baby's behavior were interactively positive, or could be interpreted as such by the other member; any two-step chain containing a do-nothing or distress was therefore excluded. Table 3 summarizes this data for each group of dyads.

Insert Table 3 about here

Of all possible two-step chains between baby and mother, dyads with deaf-blind babies had an average of 16.25 positive two-step chains, comprising 33% of the total interaction. Once entered into, positive chains in these dyads had an average length of 3.25 coded behaviors, or slightly more than one and a half complete interactive turns. In contrast, the average number of positive two-step chains for the dyads with nonhandicapped babies was 52.75, or 73% of the total interaction, with an average length of 12.47 behaviors. These proportions were significantly different across the two groups ($z = -3.52$, $p < .001$). In the dyads with nonhandicapped babies, the proportion of positive two-step chains was greater than chance ($z = 2.69$; $p < .01$); no difference from chance was found for the dyads with deaf-blind babies.

Because of the extremely long chains of one of the dyads in the nonhandicapped group, a second mean was computed excluding this dyad, yielding an average length of 6.79, rather the 12.47 behaviors. Even using this more conservative mean, the dyads with nonhandicapped babies had interactive sequences with twice as many complete interactive turns as the dyads with deaf-blind babies. The deaf-blind baby/mother dyads thus not only entered into positive chains of interaction much less often, but were also less able to maintain these chains for as many turns; in general, these chains consisted of a mother behavior → baby behavior → mother behavior. Data for individual dyads showed that the longest mean length of positive chains for any deaf-blind baby was only slightly larger than the shortest mean length of chains for any nonhandicapped baby. When the dyads with nonhandicapped babies entered into positive chains, they were very likely to be of a more reciprocal and socially interactive nature, and to last much longer.

The length of chains of affect are one aspect of predictability; they are even more revealing as an interactive index in combination with an examination of category change. A baby may exhibit any combination of predictability of affect (low or high) and predictability of category (low or high), with very different consequences for the quality of the interaction. In order to determine whether differences in chains of similar affect were associated with chains of behavior within the same modality, the proportion of category changes was computed for each group, and then combined with changes in affect. As shown in Table 4, the mean frequencies of category change for the two groups were significantly different ($p < .01$). Since this might be expected simply from differences in the amount of interaction

- - - - - - - - - - - - - - - - - - -

Insert Table 4 about here

- - - - - - - - - - - - - - - - - - -

in the two groups, the probability of category change provides a more interesting basis for comparison. First, given any behavior, what is the probability of a category change? Second, given a category change, what is the probability of a change in affect? Finally, how likely is it that a category change will be to, or to another, affectively positive category? While the difference did not reach significance, there was a tendency for the nonhandicapped babies to change categories proportionately more than the deaf-blind babies ($p_{db} = .53$; $p_{nhc} = .62$). Given a category change, however, the deaf-blind baby was much more likely to change affective states as well ($p_{db} = .90$; $p_{nhc} = .43$; $z = 4.09$; $p < .001$). Furthermore, the deaf-blind babies were not only more likely to change affect; it was also less likely that the category change would be to, or to another, positive interactive category ($p_{db} = .10$; $p_{nhc} = .56$; $z = -2.59$; $p < .01$). The nonhandicapped babies were therefore more likely to change categories and to maintain positive affect across these changes, combining variety in interactive modality with generally positive affect, while the deaf-blind babies showed less variety in modality with less predictable affect across category changes.

Thus, when the mother of a nonhandicapped baby initiated any interaction, she could with much more certainty predict (a) obtaining a response, (b) the type of response that it would be, and (c) the affect of the response, than could the mother of a deaf-blind baby. In contrast to the nonhandicapped babies, then, the deaf-blind babies undoubtedly violated many expectations commonly held regarding the behavior of partners in social interaction. They were less responsive, less predictable, and generally less interactive. It was left to the mother to carry the burden of initiating interactive sequences and of obtaining a response in the face of uncertainty about what response her efforts would bring; such inability to control the quality of the interaction could easily be accompanied by a sense of incompetence in the role of social partner for the baby, affecting the confidence with which the mother approached the interaction. Despite these difficulties, however, the deaf-blind babies and their mothers did engage in sequences of social interaction which was different from chance, indicating that the mothers somehow adjusted their own interactive patterns in order to establish contact with their babies.

While several approaches to studying such adjustments are possible, the analyses presented here for the mothers will be similar to those already presented for the babies. Differences between groups of mothers will be examined in terms of (a) the use of modalities, both in general and in response to particular baby behaviors, and (b) patterns of repetition and change following different baby affective states; these differences will then be discussed in terms of their possible adaptive functions within the interactions.

Table 5 presents information analogous to that in Table 1; the roles of initiator and responder are, however, reversed, so that cells represent the frequencies and probabilities for baby initiation and mother response, while the column totals represent frequencies and proportions of overall mother use of each of the categories. While many cell frequencies were

---

Insert Table 5 about here

---

small and again minimized the number of possible statistical analyses, a combination of procedures, along with visual analysis, helps to build a more complete description of the mothers as the interactive partners of the two groups of babies.

The do-nothing category accounted for very little of the parents' behavior in either group, and both groups of parents used the verbal/ vocal category with a higher probability than they did any of the other categories. In the group of parents with normal babies, this category accounted for more than half of the interactive behaviors. Mothers of the deaf-blind babies tended to spread their interactions more evenly over a broader range of categories, and were almost equally as likely to engage in kinesthetic or tactile stimulation as in vocalization. The proportion of behaviors in the vocal/verbal category was therefore lower. A further difference evident from a visual analysis is that the second most frequently used mother category in the deaf-blind group was kinesthetic, rather than tactile. The very low probabilty of the use of gaze by the parents of the deaf-blind babies was notable; these mothers very rarely looked directly into their babies' faces.

A chi-square comparison of the category profiles of the two groups, using the results for the mothers of the nonhandicapped babies as expected values, yielded a significant difference between groups ($X^2 = 54.43$; $p < .001$; df = 4) in the distribution of behavior across categories. Typical category profiles of the groups were thus related to the type of dyad of which the mother was a part, i.e., deaf-blind or nonhandicapped, as they were for the babies. A comparison of each of the groups of mothers with chance values (based on p = .20) also yielded significant differences in both groups (X^2_{db} = 47.01, $p < .001$, df = 4; X^2_{nhc} = 172.88, $p < .001$, df = 4).

As with the babies, a comparison of analogous cells in the column profiles, both to each other and to chance, yielded a more specific description of where these differences occurred. Across groups, the only significant difference of the five comparisons was in the use of gaze ($z = -2.46$, $p < .05$), although the use of vocalization also approached significance ($z = -1.8$). A comparison of each cell with chance showed that the mothers of the deaf-blind babies used significantly less gaze than would be expected from an even distribution of behaviors across categories ($z = -2.25$, $p < .05$), while the mothers of the nonhandicapped babies used significantly more vocalization ($z = 2.91$, $p < .01$).

As with the babies, the question arises as to whether these overall patterns were reflected in responses to each baby category, or whether differential contingent responding characterized the typical mother behaviors following each baby behavior. While small frequencies again precluded the use of the chi-square on the total matrices, it was possible to compare several of the cells with what would be expected from row and column totals. The binomial *z* was used to compare cell frequencies representing contingent response patterns with what would be expected from overall category use, as shown in the row and column totals. In the dyads with nonhandicapped babies, the mothers responded significantly differently than would be expected from the uncontingent probabilities in three different cells (out of a total of 22 comparisons), including gaze → vocal ($z = 2.59$, $p < .01$), move → tactile ($z = 5.92$, $< .001$), and do nothing → tactile

($z = 5.65$, $p < .001$). In the deaf-blind group, the binomial test applied to within-group comparisons of thirteen of the individual cells of baby initiation/mother response patterns with conditional probabilities based on the row and column totals yielded two significant differences. The contingent probabilities of gaze → tactile ($z = 3.15$, $p < .01$) and distress → do-nothing ($z = 3.64$, $p < .001$) were both significantly greater than would be expected from the unconditional probabilities. Unlike the babies, then, the contingent responses of both groups of mothers were different from their overall category use. Each group of mothers varied responses in relation to the preceding baby behavior, but they did so in different ways.

A visual analysis of the two matrices further shows that the mothers of the normal infants were highly predictable in their modality of response; three out of four types of baby initiation (gaze, vocal and distress) were likely to be followed by verbal/vocal behavior on the part of the parent; the fourth (movement) was most often followed by either tactile or verbal/vocal behavior. While they were somewhat similar, the patterns of parent response were much less clearly defined in the deaf-blind baby/parent dyads. Verbal/vocal behavior had the highest probability of occurring in general, as it did with parents of the normal babies; however, it was much less clearly contingent on particular baby behaviors. For example, the probability of a parent verbal/vocal response to baby gaze in the nonhandicapped sample was .71. In the deaf-blind sample, while the probability of a verbal/vocal response to infant gaze was greater than that for other responses, it was also more closely followed by tactile and kinesthetic. The parent of the deaf-blind baby was more likely to use a verbal/vocal behavior following a baby movement than was the parent of the normal baby, who was more likely to use the tactile modality to respond to baby movements.

Baby distress and do-nothing were also followed by different types of parent behaviors in the two groups. The parents of the normal baby were most likely to use verbal/vocal behavior following a baby distress, while the mother of the deaf-blind baby used tactile behavior. Following a baby do-nothing, the parent of the normal baby used the tactile category, while the parent of the deaf-blind baby was most likely to use either kinesthetic or verbal/vocal. These differences raise questions concerning possible differences in the meanings attached to baby behavior in the two groups of mothers.

Given the different characteristic affective styles of the two groups of babies, and assuming that a primary objective of the mothers would be to obtain the maximum amount of positive interaction, one might also expect to find differences in strategies of repetition and change which the mothers might use after different baby affective states. For example, when the baby was exhibiting distress, was the mother more likely to change her mode of interaction or to maintain the one she was already using? That is, what strategies did the mother use to change or maintain a given affective state in the baby? Such an examination is closely related to the predictability of affect in the infant, as the mother would be expected to use the categories which she perceived to be most likely to bring about or maintain a positive interaction. Because the deaf-blind babies were less consistent in their contingent responding to any mother category than were the nonhandicapped babies, it was predicted that the mothers of these babies would be less decisive in their use of particular patterns of behavior following different baby affective states.

Table 6 presents frequencies and probabilities of parent change and repetition following each baby affective state. From the unconditional

---

Insert Table 6 about here

---

probabilities in the column profiles, it is apparent that both groups of parents used a change strategy more often than they used repetition. This was, however, more characteristic of the mothers of the nonhandicapped than of the deaf-blind babies.

A comparison of the category profiles yielded a significant difference between groups in the overall use of these two strategies ($X^2 = 21.88$, $p < .001$, $df = 1$). A comparison of analogous cells across groups, however, yielded no significant differences between groups for use of either strategy. A further comparison of the profile of each group with chance, based on an expected value of .50, showed that the use that parents of nonhandicapped babies made of change and repetition differed significantly from chance ($X^2 = 7.88$; $p < .05$, $df = 2$), while that of the mothers of the deaf-blind babies did not. By applying the z to each cell, using $p = .50$ as the expected value, it was found that the parents of nonhandicapped babies used a change strategy significantly more and repetition significantly less ($z = \pm 2.9$; $p < .01$) than chance. Repetition and change in the deaf-blind group were both very close to a chance level.

The two groups of mothers thus differed in their typical overall use of change and repetition. In order to determine whether this difference between groups would be further reflected in contingent relationships between the preceding baby behavior and the type of mother strategy used, a chi-square analysis was performed to compare the total contingency matrices of the two groups, and yielded a significant difference between groups (χ^2 = 76.13, p < .001, df = 2); the relationship between the babies' affective state and the mothers' use of the two strategies was different in the two groups of mothers. When the individual cells of each of the contingency matrices were compared to expected values based on the uncontingent probabilities listed in the row and column profiles, the only significant difference found was in the nonhandicapped group; mothers of these babies used more change and less repetition following baby negative ($z = \pm 2.35$, $p < .05$) than would be expected from overall use of these strategies.

A visual analysis of the two matrices shows that both groups of parents were almost twice as likely to change their category of interaction following a negative infant behavior as they were to repeat; only in the nonhandicapped group, however, was this difference significant. A positive infant behavior was also slightly more likely in both groups to be followed by a change in category. Following a baby do-nothing, the pattern was very different. While parents of the normal babies were much more likely to change, parents of the deaf-blind babies were equally likely to change and to repeat. Thus, when the deaf-blind babies were neutral (i.e., doing nothing), which was 50% of the time, the mothers seemed to be most uncertain about which strategy to use, employing both repetiton and change at a chance level.

To summarize, the two groups of mothers were qualitatively similar in the low proportion of do-nothing as compared to the other categories: neither group let their babies act without them. They were also similar in their greater use of the verbal/vocal category, one of the most common and "familiar" of the categories of social interaction. The mothers of the deaf-blind babies, however, used this category proportionately less and the kinesthetic category proportionately more, thus shifting their typical mode of interaction to emphasize another to which their babies were responsive. Patterns of contingent responding also differed for the two groups of mothers. That is, the same baby behaviors were followed by different responses in the two groups, with typical patterns in the nonhandicapped group looking much like they might look in everyday social interaction in their greater reliance on vocalization and gaze as interactive categories. Finally, mothers of the deaf-blind babies were less predictable both in the modality which they would use following a particular baby modality, and in the patterns of repetition and change which they would employ after particular affective states.

Discussion

Given the instruction to "play with your baby as you usually do," it may be assumed that the objective of the interactions recorded here would be to engage the baby, and to obtain and continue interactive responding. Whatever worked for this purpose would, in some sense, be adaptive. With the nonhandicapped baby, it was possible for the mothers to meet this objective through familiar patterns of social interaction. For the mothers of the deaf-blind babies, more adjustment was necessary; they had to change their own familiar patterns to match the unfamiliar patterns of their babies. It is not surprising that differences between the two groups of mothers were found in the total amount of interaction, modalities used in interaction, patterns of contingent response, and patterns of repetition and change. The question remains as to whether these differences were adaptive in the sense of maximizing positive social interaction with the babies.

The mothers of the deaf-blind babies were less active overall than were the mothers with normal babies; this finding is consistent with results from other studies with preterm and handicapped populations (e.g., DiVitto & Goldberg, 1979, Field, 1979; Kogan, Wimberger & Bobbitt, 1969). However, in relation to their babies, the mothers were proportionately more active, engaging in twice as many interactive behaviors as did the babies. Such persistence is remarkable in the face of the difficulty of obtaining a response, and when obtained, of that response being not only less predictable in modality and affect, but also being of a kind not usually interpreted as being socially interactive. Such persistence was obviously essential, however, for it was only this which allowed the interaction to continue. While it cannot be directly deduced from these data, it seems clear that the deaf-blind babies probably did not provide any kind of interactive rhythm into which the mothers could enter, or even many behaviors to which the mother could respond, placing the burden for the interaction squarely on the mother. It is not surprising that these interchanges resembled chains of stimulus-response rather than interactive sequences. The mothers, despite the lower rate of interaction, did assume this burden, initiating most of the two-step chains that occurred, thereby adjusting to the babies' lower level of behavior; this adaptation seems crucial for the survival of the these interchanges as interactions.

The lower number of interchanges might also indicate a different kind of adaptation, i.e., more "wait-time" between mother behaviors, an adjustment which might be very adaptive for babies who require a longer pause in order to respond; this possibility would have to be subjected to a different type of analysis than is possible with the present data.

The heavier reliance on kinesthetic stimulation illustrates an adaptation which substitutes a non-traditional interactive category for the more traditional ones which did not work as well; the mothers had learned to use a modality to which the babies would respond. They may also be adjusting their strategies for eliciting pleasurable responses to a lower cognitive level at which their babies may be functioning (Cicchetti & Sroufe, 1978), despite the developmental matching of babies used in this study. The relatively lower probability of all categories, i.e., the more even spread of mother behaviors over categories, may also indicate either an uncertainty about what will work, or an exploration of alternative modalities. Because the mothers were therefore less predictable in their responses following particular baby categories, this difference may in that sense not be an adaptive one for the baby. The reliance on non-traditional categories might also be regarded as at least partially non-adaptive because it may not be conducive to the baby's learning more appropriate social patterns (such as vocal → vocal).

Unlike the normal baby, the deaf-blind baby often responded to the tactile modality with distress. Touching or stroking, for this baby, may not have served as a means of soothing or maintaining contact. This particular pattern, i.e., distress to touching, is consistent with the tactile defensiveness found in many deaf-blind babies. The mothers, however, continued to use the tactile category following infant distress, a pattern that would seem to be non-adaptive in that the most likely baby response, if there was a response, was more distress. Because the next most likely mother response to baby distress was do-nothing, it seems clear that these mothers probably experienced a great deal of uncertainty about how to change this affective state to a happier one.

The mothers' low level of using gaze as a possible communicative category is particularly interesting, and seems to be a non-adaptive difference, for their babies used it relatively more than they did, indicating that it had potential as an avenue for maintaining contact with these babies. A number of interpretations are possible. First, the mothers may have been adjusting to perceptions of the babies' capabilities based on the diagnosis of deaf-blind, rather than to real capabilities. Second, they may have been adjusting to the size of the babies (remember the chronological age), holding them on the lap facing outward rather than in a face-to-face position. Such positioning, for the normal baby of the same chronological age, may be an appropriate adaptive mechanism, enabling the baby to view and learn about the world beyond the mother. Holding the baby facing outward, therefore, may be both adaptive and non-adaptive, illustrating the complexity of this issue.

Differences in contingent responding show the same complexity in interpretation. The different meanings which the mothers in the two groups seem to attach to the same infant behaviors provide an illustration. When the deaf-blind babies did nothing, their mothers were most likely to use kinesthetic stimulation, establishing the 2-3 step chain that was the most typical pattern for these dyads. The "do-nothing" category seems to have been interpreted by the mothers of these babies as a non-interactive category, and one to be followed by an initiation. When the normal babies did nothing, their mothers were most likely to use the tactile category. The mothers of these babies did not seem to be trying to elicit a response, but rather to be employing a "wait" strategy; it seems plausible that these mothers did not interpret the do-nothing as an absence of interaction, but rather as a rest period during which contact was maintained by touch while waiting for the interaction to return in the form of the more communicative vocalization and gaze categories. A second example of possible differences in meanings attached to baby behaviors is provided by the responses of the two groups of mothers to baby movement. When the normal babies moved, the mothers were most likely to use the tactile modality, possibly as a soothing technique or again as a "wait" strategy; movement seemed to be viewed as a secondary communicative modality by these mothers, rather than as a primary one. When the deaf-blind baby moved, the mothers were most likely to use the vocal/ verbal category; movement was responded to as if it were a primary communication category. While the mothers of the nonhandicapped babies thus seem to have differentiated between those behaviors which usually comprise social interaction and those which do not, the mothers of the deaf-blind babies seem to be willing to treat any behavior as social interaction, a response which seems to be very adaptive in this situation.

If repetition is useful for obtaining responses from the deaf-blind babies, the mothers of the deaf-blind babies' relatively greater use of repetition is a further difference that may indicate an adaptive response, and has been found in other studies with handicapped babies (Walker & Becker, in preparation). In order to examine the adaptive function of repetition more fully, an analysis would have to be made of differences in responses of the deaf-blind babies following repetition and change in order to determine which strategy was more successful. The almost equal reliance on the two strategies following the babies' doing nothing seems to indicate an uncertainty about what will work; no adjustment to the babies was made in this case.

An examination of differences as possible adaptations strongly supports the notion that a simple description of differences between populations of dyads is not enough, for differences may indicate adaptations, or at least adjustments, to characteristics of the babies. It would be beneficial to review past descriptions of differences between populations with this in mind, and to direct future research toward the complexities of this issue.

References

Chicchetti, D., & Sroufe, L. A. An organizational view of affect: Illustration from the study of Down's syndrome infants. In M. Lewis, & L. A. Rosenblum (Eds.), The Development of Affect. New York: Plenum Press, 1978.

DiVitto, B., & Goldberg, S. The effects of newborn medical status on early parent-infant interaction. In T. M. Field, A. Sostek, S. Goldberg, & H. H. Sherman (Eds.), Infants Born at Risk. New York: Spectrum, 1979.

Field, T. M. Interactions of preterm and term infants with their lower- and middle-class teenage and adult mothers. In T. M. Field (Ed.), High-Risk Infants and Children. New York: Academic Press, 1980.

Fleiss, J. L. Statistical Methods for Rates and Proportions. New York: John Wiley, 1973.

Gottman, J. M., & Bakeman, R. The sequential analysis of observational data. In M. E. Lamb, S. J. Suomi, & G. R. Stephenson (Eds.), Social Interaction Analysis: Methodological Issues. Madison: University of Wisconsin Press, 1979.

Kogan, K., Wimberger, H., & Bobbitt, R. Analysis of mother-child interaction in young mental retardates. Child Development, 1969, 40, 799-812.

Robson, C. Experiment, Design and Statistics in Psychology. New York: Penguin Books, 1973.

Siegel, S. Nonparametric Statistics. New York: McGraw-Hill, 1956.

Suomi, S. J. Levels of analysis for interactive data collected on monkeys living in complex social groups. In M. E. Lamb, S. J. Suomi & G. R. Stephenson (Eds.), Social Interaction Analysis: Methodological Issues. Madison, Wisconsin: University of Wisconsin Press, 1979.

Walker, J. A. & Becker, J. W. Developmental changes in social games: Handicapped twins and their parents. In preparation.

Table 1

Contingency Matrices for

Parent Initiate/Baby Respond

Response: Deaf-Blind (db) Baby

Parent Initiation	Gaze	Vocal	Move	Distress	Do Nothing	Total Freq.	Uncond. Prob.	
Gaze	(0) 0	(0) 0	(1) 1.0	(0) 0	(0) 0	1	.01	
Vocal	(4) .12	(1) .03	(8) .24	(2) .06	(19) .56	34	.37	
Tactile	(4) .16	(0) 0	(3) .12	(6) .24	(12) .48	25	.27	
Kinesthetic	(5) .18	(0) 0	(8) .29	(1) .04	(14) .50	28	.30	
Do Nothing	(0) 0	(1) .25	(1) .25	(1) .25	(1) .25	4	.04	
Total Freq.	13	2	21	10	46	92	.99	Total
Uncond. Prob.	.14	.02	.23	.11	.50	1.00	18.4	Rate/Minute

Response: Normal (nhc) Baby

Parent Initiation	Gaze	Vocal	Move	Distress	Do Nothing	Total Freq.	Uncond. Prob.	
Gaze	(7) .44	(4) .25	(0) 0	(5) .31	(0) 0	16	.11	
Vocal	(25) .32	(30) .38	(9) .12	(7) .09	(8) .10	78	.55	
Tactile	(7) .23	(3) .10	(12) .40	(4) .13	(4) .13	30	.21	
Kinesthetic	(5) .36	(2) .14	(3) .21	(1) .07	(3) .21	14	.10	
Do Nothing	(0) 0	(1) .25	(0) 0	(2) .50	(1) .25	4	.03	
Total Freq.	44	40	24	19	16	143	1.00	Total
Uncond. Prob.	.31	.28	.17	.13	.11	1.00	28.6	Rate/Minute

Note: Each cell contains the cell frequency (in parentheses) and the transitional probability

Comparison of babies' category profiles for groups: $x^2 = 118.83$, $p \leq .001$

Comparison of analogous cells in category profiles: $z_{voc} = -2.04$, $p \leq .05$; $z_{d.n.} = 2.69$, $p \leq .01$

---- Significant differences in comparison of category profile cells to chance (z)

.... Significant differences in comparison of conditional to unconditional probabilities (z) (no significant differences)

Table 2

Baby Affective Responses to Parent Initiation in Different Modalities

Parent Initiation	Baby Response: Frequency (b): db +	db −	db n	db tot. freq.	nhc +	nhc −	nhc n	nhc tot. freq.	Probability: db +	db −	db n	db unc. prob.	nhc +	nhc −	nhc n	nhc unc prob.
Visual	1	0	0	1	11	5	0	16	1.00	0	0	.01	.69	.31	0	.11
Vocal	13	2	19	34	64	7	8	78	.38	.06	.56	.37	.82	.09	.10	.55
Tactile	7	6	12	25	22	4	4	30	.28	.24	.48	.27	.73	.13	.13	.21
Kinesthetic	13	1	14	28	10	1	3	14	.46	.04	.50	.30	.71	.07	.21	.10
Do Nothing	2	1	1	4	1	2	1	4	.50	.25	.25	.04	.25	.50	.25	.03
Total Freq.	36	10	46	92	108	19	16	142								
Uncond. Prob.	.35	.11	.50	—	.76	.13	.11	—								

Comparison of babies' category profiles for groups: $x^2 = 108.51$; $p \leq .001$

Comparison of analogous cells in category profiles: $z_{pos} = 3.9$, $p \leq .001$; $z_{neut.} = 2.69$, $p \leq .01$

---- Significant differences in comparison of category profile cells to chance (z)

.... Significant differences in comparison of conditional to unconditional probabilities (z) (no significant differences)

Comparison of total contingency matrices for groups: $x^2 = 134.3$, $p \leq .001$

Table 3

Mean Frequency and Length

of Positive Interpersonal Two-Step Chains

		$\bar{x}$	s.d.	t	signif. level	prob.	z.	signif. level
Mean Number of positive two-step chains	db nhc	16.25 52.75	11.50 7.59	-5.298	.0018	.33 .73	-3.52	.001 *
Mean Length of positive two-step chains	db nhc	3.25 12.47	1.55 11.46	-1.595	.2152	-		-

*significant difference between groups

Table 3

Mean Frequency and Length

of Positive Interpersonal Two-Step Chains

		$\bar{x}$	s.d.	t	signif. level	prob.	z	signif. level
Mean Number of positive two-step chains	db nhc	16.25 52.75	11.50 7.59	-5.298	.0018	.33 .73	-3.52	.001 *
Mean Length of positive two-step chains	db nhc	3.25 12.47	1.55 11.46	-1.595	.2152	-		-

*significant difference between groups

Table 4

Mean Frequency and Probability

of Changes in Baby Category and Affective State

		Cell Freq.	$\bar{X}$ Freq.	s.d.	t	Signif. level	prob.	z	Signif. level
Total Category Changes	db nhc	48 88	12.0 22.0	5.60 1.63	3.430	.0140*	.53 .62	.83	ns
Affect Changes/ Total Changes	db nhc	43 38	10.75 9.50	5.25 6.24	.306	.7697	.90 .43	4.09	<.001*
Positive Two-step Changes/ Total Changes	db nhc	5 49	1.25 12.25	1.26 4.79	4.445	.0044*	.10 .56	-2.59	<.01*

* Significant differences between groups

Table 5

Contingency Matrices for

Baby Initiate/Parent Respond

Initiate: Deaf-Blind Baby	Parent Response: Gaze	Vocal	Tactile	Kinesthetic	Do Nothing	Total Freq.	Uncond Prob.	
Gaze	(0) 0	(5) .36	(4) .29	(4) .29	(1) .07	14	.15	
Vocal	(0) 0	(0) 0	(1) 1.00	(0) 0	(0) 0	1	.01	
Move	(0) 0	(12) .57	(2) .10	(6) .29	(1) .05	21	.23	
Distress	(0) 0	(3) .23	(5) .38	(1) .08	(4) .31	13	.14	
Do Nothing	(1) .02	(16) .37	(9) .21	(17) .40	(0) 0	43	.47	
Total Freq.	1	36	21	28	6	92	1.00	Total
Uncond. Prob.	.01	.39	.23	.30	.07	1.00	18.4	Rate/Minute

Initiate: Normal Baby	Parent Response: Gaze	Vocal	Tactile	Kinesthetic	Do Nothing	Total Freq.	Uncond. Prob.	
Gaze	(5) .12	(30) .71	(5) .12	(1) .02	(1) .02	42	.30	
Vocal	(7) .17	(27) .64	(3) .07	(5) .12	(0) 0	42	.30	
Move	(1) .05	(8) .36	(10) .45	(3) .14	(0) 0	22	.16	
Distress	(3) .16	(9) .47	(3) .16	(2) .11	(2) .11	19	.13	
Do Nothing	(1) .06	(4) .25	(7) .44	(3) .19	(1) .06	16	.11	
Total Freq.	17	78	28	14	4	141	1.00	Total
Uncond. Prob.	.12	.55	.20	.10	.03	1.00	28.6	Rate/Minute

Comparison of mothers' category profiles for groups: $x^2 = 54.43$, $p \leq .001$

Comparison of analogous cells in category profiles: $z_{gaze} = -2.46$, $p \leq .05$

---- Significant differences in comparison of category profile cells to chance (z)

.... Significant differences in comparison of conditional to unconditional probabilities (z)

Table 6

Proba[illegible]ility of Parent [illegible]e of Repeats/Changes

Following Baby Affective States

		Parent Response					
		(a) Parent of db			Parent of nhc		
		Change	Repeat	Uncond. Prob.	Change	Repeat	Uncond. prob.
Baby Affective State	Positive	(18) .53	(16) .47	(34) .40	(50) .54	(42) .46	(92) .67
	Negative	(8) .73	(3) .27	(11) .13	(19) .86	(3) .14	(22) .16
	Do Nothing	(19) .46	(22) .54	(41) .48	([illegible]7) .71	(7) .29	(24) .17
	Uncond. Prob.	(45) .52	(41) .48	(86)	(86) .62	(52) .38	(138)

Each cell contains the cell frequen[illegible] (in parentheses) and the transition probability

Comparison of mothers' category profiles for groups: $x^2 = 21.88$, $p \leq .001$

Comparison of analogous cells in category profiles: no significant differences

---- Significant differences in comparison of category profile cells to chance (z)

.... Significant differences in comparison of conditional to unconditional probabilities (z)

Comparison of total contingency matrices for groups: $x^2 = 76.13$, $p \leq .001$