1983

Adults' Responses to Infant State Patterns

Linda Vest Klein
Loyola University Chicago

ADULTS' RESPONSES TO INFANT STATE PATTERNS

by

Linda Vest Klein

A Thesis Submitted to the Faculty of the Graduate School of Loyola University of Chicago in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

March

1983

DEDICATION

This work is dedicated to my husband, John, with love.

ACKNOWLEDGMENTS

I would like to acknowledge the wise suggestions and recommendations, as well as the support and encouragement given to me by Deborah L. Holmes, the Director of my thesis, and by Jill N. Nagy, the other member of my committee. I would also like to thank the staff of the Evanston Hospital for their assistance in this research.

VITA

The author, Linda Vest Klein, is the daughter of James Weston Vest and Susan Robb Vest. She was born August 12, 1954, in St. Paul, Minnesota. August 9, 1980, she married John Kieran Klein in Minnetonka Beach, Minnesota.

Her elementary education was obtained in the public schools of Northbrook, Illinois. Secondary education was obtained at Orono Senior High School, Long Lake, Minnesota, where she graduated in 1972.

In September, 1972, she entered Carleton College, in Northfield, Minnesota, which she attended until March, 1975. She then transferred to the Institute of Child Development at the University of Minnesota. In June, 1977, she received the degree of Bachelor of Arts with a major in child development.

While attending the University of Minnesota, she volunteered at the University's Program for Autistic-type Children, and in June, 1977, she became employed as a teacher-therapist in that program. In September, 1978, she was employed as a research assistant at the Institute of Child Development.

In August, 1979, she entered the graduate program in clinical psychology at Loyola University of Chicago. She trained as a psychology trainee at the Loyola Guidance Center and Day School from August, 1979 to August, 1981. In September, 1981, she was granted a graduate assistantship in the Psychology Department. In September, 1982, she began an internship at the Veterans Administration Medical Center, Minneapolis, Minnesota.

TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS ii

VITA iii

LIST OF TABLES v

CONTENTS OF APPENDIX vi

Chapter

I. INTRODUCTION AND LITERATURE REVIEW . . . 1

II. METHODS 10

Materials 10
Subjects 14
Procedure 14

III. RESULTS 18

Summary Scores 19
Individual Items 21

IV. DISCUSSION 32

REFERENCE NOTES 35

REFERENCE LIST 36

APPENDIX A 40

LIST OF TABLES

Table		Page
1.	Segments within Videotapes	13
2.	Age of Subjects in Each Group Exposed to Different Videotape Stimuli	15
3.	Group Means: Subjects' Reactions to Infants--Summary Score	20
4.	Group Means: Subjects' Happiness with Infants	23
5.	Group Means: Subjects' Wish to Play with Infants	25
6.	Group Means: Subjects' Wish to Vocalize with Infants	26
7.	Group Means: Amount of Infant Crying Perceived by Subjects	29
8.	Group Means: Quality of Infant Sleep Perceived by Subjects	31

CONTENTS OF APPENDIX

Page

APPENDIX A Rating Scale 40

CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

It has been determined that preterm infants (those born before 37 weeks gestational age) are at greater risk than are full-term infants for subsequent difficulties in their social, emotional, and cognitive development. Subtle cognitive and intellectual deficits have been documented in children who were born preterm (Caputo, Goldstein, & Taub, 1979). Also, retrospective (Elmer & Gregg, 1967; Klein & Stern, 1971; Lynch & Roberts, 1977) and prospective studies (Hunter, Kilstrom, Kraybill, & Loda, 1978) have found that preterm children are vastly overrepresented in cases of child maltreatment and abuse. However, even within the group of preterm infants and children, the incidence of these later casualties is not large enough to allow accurate prediction of the problems merely from the fact of preterm birth. Other factors in addition to preterm birth must be considered. The quantity and quality of the caretaking that is given to these infants and children is one such factor to be considered when searching for contributing elements in the subsequent difficulties experienced by some of these children (Sameroff & Chandler, 1975). One important aspect of caretaking is the relationship and

interaction pattern between parents and children. It has long been an assumption or belief of many developmental psychologists that early experiences influence later development. Given this assumption, it would seem likely that the earliest interactions between parents and their infants would be important factors in the establishment of their succeeding relationships, which in turn are held to be of prime importance in the development of social, emotional, and cognitive skills in the children.

In this light, it is significant that even the earliest interactions between neonates and their parents differ for full-term and preterm infants. Quantitatively, mothers of preterm infants have been described as being more verbal during interactions with their babies than are mothers of full-term infants (Cohen & Beckwith, 1976; DiVitto & Goldberg, 1979; Field, 1977a; Field, 1980b). In addition, mothers of preterms have been observed to be "more stimulating in all modes (visual, tactile, auditory and vestibular)" when interacting with their babies (Field, 1977a; Field, 1979b). Other quantitative differences that have been observed in comparisons of interactions between parent/full-term infant and parent/preterm infant dyads include less body contact (DiVitto & Goldberg, 1979; Leifer, Leiderman, Barnett, & Williams, 1972; Klaus, Kennell, Plumb & Zuelke, 1970; Goldberg, Brackfeld, & DiVitto, 1980), and

less smiling at infants (DiVitto & Goldberg, 1979; Leifer, et al., 1972; Klaus, et al., 1970) in the parent/preterm infant dyads. Mothers of preterm infants have also been portrayed as being less sensitive to their infants' feeding behaviors and rhythms: they more continuously stimulate their babies during feedings rather than reserving the stimulation for nonsucking periods as do mothers of full-term infants (Field, 1977a).

Mother/preterm infant interactions have also been observed to deviate qualitatively from the norm for healthy full-term babies' interactions with their mothers. Mothers of preterms are rated as overly persistent and intrusive in their initiations of interaction with their babies. They are seen as not "speaking the same language" as their infants because they exhibit fewer infantized and imitative behaviors than do full-term mothers (Field, 1980a). Preterm mothers also fail to "play the same game" as their infants because they frequently introduce games such as "peek-a-boo" at inappropriately early stages in their babies' development (perhaps because they think in terms of chronological rather than developmental or conceptional age) (Field, 1979c).

Mothers of preterms also fail to take turns with their infants, responding themselves during their infants' turns. The mothers of preterm babies often are observed

not to allow their infants to create breaks in the interactions. For example, these mothers persistently put their faces in the infants' fields of vision even if the children have averted their gazes. Moreover, mothers of preterms often increased their own activity during gaze aversions by the infants, rather than slowing their activity to allow a quiet period to occur. Finally, these mothers more often failed to respond contingently to their babies; they were less likely to attend to infant cues and to modulate their activity in response to those cues (Field, 1980a).

In addition to the differences in the quantity and the quality of the interactions between preterm/mother and full-term/mother dyads, there are some obvious differences in caretaking behaviors between full-term and preterm mothers. For example, during feedings, preterm infants have been observed to be held by their mothers in ways that have been described as non-cradling and less optimal than the positions used by mothers of full-term babies (Field, 1980a).

These differences exhibited by mothers of preterm infants in both quantitative and qualitative dimensions of interactive and caretaking behavior occur in precisely the areas (turntaking, contingency, etc.) that are viewed as the essential elements in the development of healthy adult/infant interactions (Field, 1980a). Further, they involve

behaviors that seem to be performed almost automatically (Stern, 1977) by parents of full-term, healthy children. Why then is it that the parents of preterm infants are so often observed to perform these behaviors differently and at a different rate than are the parents of full-term infants? There are a variety of conceivable explanations.[1]

Some of the possible explanations for the observed differences in interaction behaviors between preterm and full-term parents may involve socioeconomic influences. It has been noted that the biological outcomes of pregnancy are worse for those in poorer environments (Sameroff & Chandler, 1975), and the data indicate that the developmental outcomes for these lower SES, high-risk children are also far worse (Birch & Gussow, 1970). It might also be hypothesized that socioeconomic factors influence or contribute to interaction and caretaking behaviors and styles. Parents' emotional reactions to having produced a high-risk preterm infant might also affect their subsequent behaviors toward their infant. However, these socioeconomic and

---

[1]One possibility that must not be overlooked is that parents of preterm infants are more responsive to being observed or videotaped than are parents of full-term infants. Preterm parents, just because they produced small, usually frail infants, may try harder to be seen as "good", stimulating parents. (See Graves & Glick, 1978; Brazelton, 1981; and Field & Ignatoff, 1981, for discussions of differential responsivity to observation).

parental variables will not be examined here; rather, the characteristics of the infants themselves, and the effects of those characteristics on adults will be the focus of the present investigation.

A possibility to be considered when attempting to explain the behavior of a mother while she is interacting with her preterm infant is that the exceptional condition and behavior of the infant himself elicits the unusual behaviors from the mother. Preterm babies differ from full-term babies on a number of observable dimensions and behaviors (Holmes, Nagy, & Pasternak, in press). For example, the physical appearance of a preterm infant is quite different from that of a full-term infant. Preterm infants are likely to appear small, frail, and weak (Nagy, Holmes, Danko, & Slaymaker, Note 1), and have been found, by both registered nurses with no experience with preterm infants (Corter, Trehub, Boukydis, Ford, Celhoffer & Mende, 1978) and by parents of preterm infants (Blake, Steward, & Turcan, 1975) to be less attractive than full-term neonates.

In addition to physical appearance, another infant variable that is different for preterm and full-term infants is behavioral state patterns. For example, one aspect of infant state is crying, and the cries of preterm and full-term infants have been found to be different from

each other. The cries of preterm or high-risk infants have been described as "high-pitched cry sounds" (Zeskind, 1981). Parents respond differently to these cries than they do to cries of healthy infants (Zeskind, 1980; Frodi, Lamb, Leavitt, Donovan, Neff, & Sherry, 1978). The cries of preterm infants are considered to be more aversive than are those of full-term infants, and they elicit greater autonomic arousal in adults who are exposed to them. These adult responses occur particularly when the preterm cry is presented paired with a videotape of a preterm, rather than a full-term infant's face (Frodi, et al., 1978). This finding of different perceptions and responses by adults to the qualities of the cries of preterm infants suggests that an infant's cries constitute one infant state characteristic that might contribute to adult/infant interaction patterns. The results of the Frodi, et al. study (1978) also support the hypothesis that the physical appearance of preterm infants is a factor influencing the responses and perceptions that adults have of the infants, and which might affect parent/infant interactions.

Another infant state characteristic that could be expected to affect interactions between parents and their babies is the sleep-wake cycle or pattern of the infant. Behavioral state cycles have long been considered to be crucial variables in the study of infants. On the one

hand, the state of an infant influences his responsiveness to external stimulation (Pratt, 1934; Korner, 1972; Lewis, 1972; Emde & Robinson, 1979). Also, a particular infant's state cycle can have a profound impact on the parent's behavior toward that infant. An infant who is generally very sleepy and quiet will elicit vastly different caretaking and interactive behaviors from an adult than will an active, noisy, alert infant. Researchers have demonstrated that an infant's behavioral state can also affect adults' impressions of as well as their interactions with the infant (Bennett, 1971; Emde, Gaensbauer, & Harmon, 1976).

The role of infant state as a determinant of parental attitudes and behavior is especially relevant since preterm and full-term infants have been observed to differ in the amount of time spent in the various states of wakefulness and sleep and in the quality of their state organization (Holmes, Nagy, Slaymaker, McNeal, & Gardner, Note 2). Preterm infants spend much more time in the sleeping and drowsy states and much less time in the alert and crying states than do full-term infants. It seems likely that adults form impressions of particular infants based in part on the infants' individual state characteristics. For example, infants may be seen as alert and active versus passive, or they may be viewed as being "good sleepers" versus being "poor sleepers", etc.. It also seems possible

that adults might alter their behavior toward the infants in response to their impressions of the infants. Therefore, it might be anticipated that differences in the state patterns and cycles between full-term and preterm infants would account for at least some of the differences observed between the preterm and full-term parent/infant interactions.

The present study was designed to investigate the effects of preterm and full-term infant behavioral state patterns on adults' perceptions or impressions of and their attitudes or reactions toward babies. In addition, the effects of full-term and preterm infant appearance and the interactions between behavioral state and appearance were examined.

CHAPTER II

METHODS

Materials

The materials used in this study were videotapes made of one preterm neonate and one full-term neonate lying in their cribs. The videotapes were made the day before each infant's discharge from the hospital. The videotaping sessions began as soon as the infants were returned to their cribs after a feeding and continued until the time for the next feeding, providing approximately three hours of continuous videotape recording per session. Interruptions in the recordings took place as needed for caretaking procedures.

The preterm infant was videotaped two weeks after her birth, which occurred at 34 weeks gestation, or approximately six weeks before term. She weighed 4 lbs. at the time of the videotaping session. This Caucasian infant had blue eyes and a substantial amount of black hair. The full-term infant was videotaped 32 hours after his birth, which occurred at term, or 40 weeks gestation. At the time of the recording he weighed 6 lbs., 11 ozs.. This infant was also Caucasian, with blue eyes and black hair.

From each of these longer videotapes, two 30-minute videotapes were prepared. For each baby, one tape was edited to depict the state cycle (sleep-wake pattern) of a full-term neonate (i.e., 78% sleep, 4% drowsiness, 6% alert inactivity, 1% alert activity, 11% fussing and crying). The other was edited to depict the state pattern of a preterm neonate (i.e., 90% sleep, 6% drowsiness, 2% alert inactivity, 1% alert activity, 1% fussing and crying).[2] The infant states were identified by the following criteria:

Sleep During the sleep state the infants' eyes were closed. Startles and some motor activity were occasionally present.

Drowsiness During the drowsy state the infants' eyes were either partially open or were fully open but dazed in appearance. Motor activity was occasionally present.

Alert inactivity During the alert inactive state the infants' eyes were wide open, focused, bright and shining. Motor activity was usually absent, but was occasionally present if it involved the infants' looking behavior (i.e., when the infant slowly moved a hand across his field of vision while following it with his gaze).

---

[2]These values were taken from Holmes, Nagy, Sosnowski, Slaymaker, & Pasternak (Note 3).

Alert activity This state was characterized by the infants' wide open eyes and motor activity.

Fussing and crying During this state the infants' eyes were either open or closed, and motor activity was present. (The criteria for defining the behavioral states were adapted from Holmes, et al., Note 3).

The states were presented in the same order in each of the videotapes. There were eight segments within each of the continuous videotapes, as shown in Table 1. Each of the four videotapes commenced portraying the infant in the sleep state, then progressed to the drowsy state, then to the alert inactive state, then to the alert active state, to the crying and fussing state, back to the alert active state, again to the drowsy state, and ending with the infant in the sleep state once again. This cycle has been observed to be typical of most newborns (although, in fact, preterm infants generally do not exhibit such well-defined state patterns). The sound was not audible on the tapes, in order to avoid the confounding factor of the different qualities of the cries made by preterm versus full-term infants. The actual stimulus materials used in the study were four 30-minute videotapes depicting a: (1) full-term infant appearance/mature state pattern, (2) full-term appearance/immature state pattern, (3) preterm appearance/mature state pattern, and (4) preterm appearance/immature

Table 1

Segments Within Videotapes

State Pattern	Sleep	Drowsy	Alert Inactivity	Alert Activity
Mature	11.7*	.6	1.8	.15
Immature	13.5	.9	.6	.15

State Pattern	Crying	Alert Activity	Drowsy	Sleep
Mature	3.3	.15	.6	11.7
Immature	.3	.15	.9	13.5

*Minutes each state was presented.

state pattern.

Subjects

The subjects in this study were 92 undergraduate students enrolled in summer session classes at a Catholic university in Chicago, Illinois. There were 48 females and 44 males in the study. None of the subjects were parents. All subjects were volunteers who were recruited from undergraduate courses in psychology and theology. Subjects were randomly assigned to four groups, each of which observed a different one of the four videotapes. The mean ages of the subjects in each group can be seen in Table 2. There were no significant differences among the mean ages in the four groups.

Procedure

Subjects were tested in groups of between two and ten people over a period of one week. Each of the four videotapes was offered for viewing several times within one week so that there were approximately 12 different opportunities for subjects to participate in the study. Each videotape was offered for viewing until at least ten female and ten male subjects observed the videotape. The subjects were not told anything about the nature or the subject of the videotapes or of the study in general until they arrived to participate in the study.

Table 2

Age of Subjects in Each Group
Exposed to Different Videotape Stimuli

Appearance	State: Mature	State: Immature
Full-term	21.95* (n=21)	22.13 (n=24)
Preterm	22.52 (n=25)	21.09 (n=22)

*Age in years.

The subjects were told, when they arrived to participate, that the purpose of the study was to examine adults' reactions to babies. It was explained that they would view a videotape made of a newborn infant on the day before the baby went home from the hospital. Subjects were then informed that after viewing the videotape, they would be asked to complete a rating scale (Appendix A) assessing their impressions of and reactions to the baby. After this explanation, the subjects viewed the videotape and immediately afterward completed the rating scale. The rating scale consisted of 36 items, each presented along an eight point semantic differential scale. The first ten items assessed the subjects' impressions and perceptions of the infant viewed in the videotape (e.g., calm - excitable, small amount of crying - large amount of crying, etc.). The next ten items consisted of the same item content as the first ten, but referred to the average infant rather than to the videotaped infant. The next eight items assessed the feelings and reactions of the subjects toward the observed videotaped infant (e.g., unhappy - happy, want to play with baby - do not want to play with baby, etc.). The final eight items had the same item content as the previous group, but again referred to the average infant rather than to the videotaped infant. The rating scale also asked for some demographic data, such as the subjects' ages, whether

or not they are parents, etc.. Any questions that subjects had regarding the experiment were answered after their completion of the rating scale.

CHAPTER III

RESULTS

The data from the rating scale (Appendix A) was analyzed in several different ways. To investigate group differences in overall response patterns, two-way (Appearance by State) analyses of variance (ANOVAs) were performed on summary scores that incorporated the following groups of individual items: (1) Items 1 through 10, which assessed subjects' general impressions of the videotaped infant, (2) Items 11 through 20, which assessed subjects' general impressions of the average infant, (3) Items 21 through 28, which investigated subjects' overall reactions to the videotaped infant, and (4) Items 29 through 36, which investigated subjects' overall reactions to the average infant. The summary scores on the items assessing subjects' impressions of and reactions to the average infant were analyzed in order to investigate the contexts of the corresponding scores on the items referring to the videotaped infants. The summary scores were derived by reversing the scoring on almost half of the items (numbers 1, 3, 4, 8, 10, 11, 13, 14, 18, 20, 22, 24, 25, 26, 27, 30, 32, 33, 34, and 35) so that in all cases the more positive traits or reactions received the higher score. While it may be argued that

some of the items are ambiguous in this regard, the judgments determining which qualities would be scored in the positive direction were consistent with previous uses of similar rating scales (Nagy, et al., Note 1). The summary scores were then generated by summing the ratings for the items within each of the four groups of items previously described.

After analyzing the four summary scores, ANOVAs were performed on each of the individual items in the rating scale in order to determine which particular items were contributing to the summary score outcomes. The individual analyses were also performed in order to examine more specifically how preterm and full-term infant state patterns or appearances affected the subjects' particular impressions and reactions to the infants. The individual items referring to the average infant were also analyzed, once again to contribute to the understanding of the contexts in which the subjects responded to the videotaped infants.

Summary Scores

Of the four summary scores analyzed, only one differed significantly among the groups. This was the summary of the adults' reactions to the videotaped infants (Items 21 - 28) (Table 3). This ANOVA yielded a significant main effect for State ($F(1,88) = 5.687$, $p = .019$). Those subjects who viewed the videotapes of either infant in the

Table 3

Group Means: Subjects' Reactions to Infants--Summary Scores

	Videotaped Infant (Sum of Items 21-28)		Average Infant (Sum of Items 29-36)	
	Mature State Pattern	Immature State Pattern	Mature State Pattern	Immature State Pattern
Full-term Infant Appearance	6.17	5.13	6.44	5.97
Preterm Infant Appearance	5.81	5.38	6.29	6.12
	ANOVA State ($F(1,88) = 5.687$[1] $p=.019$		ANOVA - - - - - - - - - - - - - - -	

[1]Only those analyses that yielded statistically significant differences between groups are reported in these tables.

mature state pattern had higher (more positive) mean scores on the items assessing their feelings and reactions to the infants than did the groups which viewed the videotapes of either the full-term or the preterm infant portrayed in the immature state pattern. The ANOVA on this summary score of the subjects' overall reactions to the videotaped infant showed no significant effects of the infants' appearances ($F(1,88) = .026$, $p = .871$). There were also no significant interactions between the State and Appearance variables for this summary score ($F(1,88) = .991$, $p = .322$).

The context of these differences did not vary among the groups. In other words, the groups did not differ in their overall reactions to the average infant. In all groups, the subjects' feelings and reactions to the average infant were essentially the same.

Individual Items

The summary score of the subjects' overall reactions to the videotaped infants included three of ten possible individual items which themselves yielded significant differences among the groups. These items therefore contributed to the significant main effect for State found for that summary score.

Happiness The ANOVA on the rating scale item asking subjects whether the infant in the videotape made them feel happy or unhappy yielded a significant main effect for

State ($F(1,88) = 5.198$, $p = .025$) (See Table 4). As was true for the summary score, those groups which viewed either the full-term or the preterm infant in the mature state pattern gave themselves higher ratings for feeling happy with the infants they viewed than did those groups which viewed either infant in the immature state pattern. Again, the Appearance variable yielded no differences among the groups ($F(1,88) = .352$, $p = .555$); the subjects' feelings of happiness with the videotaped infants did not depend on the preterm or full-term appearance of the infants. There were also no significant interaction between the State and Appearance variables found in the analysis of this item ($F(1,88) = 1.930$, $p = .168$).

In terms of the context of these results, the groups did not differ significantly in their feelings of happiness engendered by the average infant. However, the groups that viewed either the full-term or the preterm infant in the immature state pattern showed a significant discrepancy between their ratings of their feelings of happiness with the videotaped infants and the average infant ($F(1,88) = 5.106$, $p = .026$); those groups felt significantly happier with the average infant than they did with the observed videotaped infant. On the other hand, although the subjects who viewed the infants in the mature state pattern rated themselves as less happy with the videotaped infants

Table 4

Group Means: Subjects' Happiness with Infants

	Videotaped Infant		Average Infant	
	Mature State Pattern	Immature State Pattern	Mature State Pattern	Immature State Pattern
Full-term Infant Appearance	6.10	4.88	6.76	6.33
Preterm Infant Appearance	5.44	5.14	6.32	6.68
	ANOVA State ($F(1,88) = 5.198$, $p = .025$)		ANOVA - - - - - - - - - - - - -	

than they did with the average infant, this difference was not statistically significant.

Play Analysis of the item assessing the subjects' wish to play with the infants viewed in the videotapes yielded a significant main effect for State ($F(1,88) = 6.35$, $p = .014$) (Table 5). The subjects who saw the infants portrayed in the mature state pattern rated themselves higher in terms of wanting to play with the videotaped infant than did those groups who viewed the infants portrayed in the immature state pattern.

The subjects' desire to play with the videotaped infants did not vary significantly as a function of the full-term or preterm appearance of the infants ($F(1,88) = .012$, $p = .913$), nor was there a significant interaction between the State and Appearance variables ($F(1,88) = 1.562$, $p = .215$). In addition, once again the context of these results, the subjects' wish to play with the average infant, did not vary among the four groups.

Vocalizing There was a main effect for State ($F(1, 88) = 9.051$, $p = .003$) for the item referring to the subjects' desire to vocalize with the videotaped infant (Table 6). Again, those who viewed the infants in the mature state pattern felt significantly more like vocalizing with the videotaped infants than did those groups that viewed the infants in the immature state pattern. There were no

Table 5

Group Means: Subjects' Wish to Play with Infants

	Videotaped Infant		Average Infant	
	Mature State Pattern	Immature State Pattern	Mature State Pattern	Immature State Pattern
Full-term Infant Appearance	6.33	4.63	6.90	5.58
Preterm Infant Appearance	5.72	5.14	6.40	6.05
	ANOVA State ($F(1,88) = 6.350$ $p = .014$		ANOVA - - - - - - - - - - - -	

Table 6

Group Means: Subjects' Wish to Vocalize with Infants

	Videotaped Infant		Average Infant	
	Mature State Pattern	Immature State Pattern	Mature State Pattern	Immature State Pattern
Full-term Infant Appearance	6.24	4.67	6.57	5.46
Preterm Infant Appearance	5.84	4.77	6.44	5.95
	ANOVA State ($F(1,88) = 9.051$) $p = .003$		ANOVA State ($F(1,88) = 4.243$) $p = .042$	

significant Appearance effects ($F(1,88) = .111$, $p = .740$) or State by Appearance interaction effects ($F(1,88) = .333$, $p = .565$) for this item.

There was also a significant main effect for State ($F(1,88) = 4.243$, $p = .042$) for the corresponding item referring to the subjects' wish to vocalize with the average infant. For this item, the subjects who viewed the infants in the mature state pattern wanted to vocalize with the average infant more than did the subjects who observed the infants in the immature state pattern. No Appearance effects ($F(1,88) = .227$, $p = .635$) or interaction effects ($F(1,88) = .665$, $p = .417$) were found for this item.

The three individual items presented above (Happiness, Play, and Vocalize) were all among the ten items comprising the summary score of the subjects' overall reactions to the videotaped infants. The remaining seven of those items did not show any significant differences among the groups. While the other three summary scores yielded no significant results, there were two individual items from those nonsignificant summary scores that themselves yielded significant differences among the groups. These items both involved the subjects' perceptions of the infants, as opposed to the already presented items, which involved the subjects' reactions to the infants.

Crying The item assessing the subjects' perceptions

of the amount of crying exhibited by the videotaped infants showed a main effect for the State variable ($F(1,88) = 7.316$, $p = .008$) (Table 7). The subjects who observed the full-term infant portrayed in the immature state pattern accurately reported significantly less crying by the infants than did the subjects who viewed the infants portrayed in the mature state pattern. The analysis of this item yielded no Appearance effects ($F(1,88) = .678$, $p = .413$) or State by Appearance interaction effects ($F(1,88) = .427$, $p = .515$).

The context of these results did not vary among the four groups; the subjects' impressions of the amount of crying by the average infant were similar for each of the groups. However, the subjects who viewed the videotapes of the infants in the immature state pattern revealed a significant discrepancy between their perceptions of the amount of crying exhibited by the videotaped infant and the amount of crying exhibited by the average infant ($F(1,88) = 7.714$, $p = .007$). The infants in the immature state pattern were perceived as crying significantly less than the average infant. While the infants in the mature state pattern were also perceived as crying less than the average infant, this difference was not statistically significant.

Sleep The analysis of the subjects' perceptions of the quality of sleep displayed by the average infant

Table 7

Group Means: Amount of Infant Crying Perceived by Subjects[1]

	Videotaped Infant		Average Infant	
	Mature State Pattern	Immature State Pattern	Mature State Pattern	Immature State Pattern
Full-term Infant Appearance	5.19	5.79	3.52	3.50
Preterm Infant Appearance	5.24	6.23	4.04	3.45
	ANOVA State ($F(1,88) = 7.316$ $p = .008$		ANOVA - - - - - - - - - - - - -	

[1]Higher ratings indicate less infant crying perceived; lower ratings indicate more infant crying perceived by subjects.

yielded a significant main effect for Appearance ($F(1,88) = 11.466$, $p = .001$) (Table 8). The subjects who observed the videotapes of the full-term infants, regardless of state pattern, rated the average infant as sleeping significantly better than did the groups who viewed the preterm infant in either state pattern. The groups did not vary in their impressions of the quality of the average infant's sleep on the basis of the State variable ($F(1,88) = .132$, $p = .717$) nor the interaction of the State and Appearance variables ($F(1,88) = 2.618$, $p = .109$). Also, the subjects' perceptions of the actual videotaped infants did not vary for this item.

Table 8

Group Means: Quality of Infant Sleep Perceived by Subjects[1]

	Videotaped Infant		Average Infant	
	Mature State Pattern	Immature State Pattern	Mature State Pattern	Immature State Pattern
Full-term Infant Appearance	6.19	6.21	5.86	6.25
Preterm Infant Appearance	5.48	5.64	5.32	4.73
	ANOVA - - - - - - - - - - - - - - -		ANOVA Appearance (F(1,88) = 11.466 p = .001	

[1]Higher ratings indicate higher quality infant sleep perceived by subjects.

CHAPTER IV

DISCUSSION

The present study investigated the effects of infant state patterns on non-parent, adult subjects. The subjects viewed videotapes of either full-term or preterm neonates portrayed in either a full-term (mature) or preterm (immature) state pattern. The results suggested that the primary difference that subjects perceived between the two state patterns was that more crying was noted when the infants were shown in the full-term state pattern than when they were portrayed in the preterm state pattern. This result indicates only that the subjects perceived something that is true: the full-term state pattern does in fact provide a larger proportion of crying than does the preterm state pattern. The sleep-wake patterns did not significantly influence the subjects' perceptions of the infants in the other areas assessed by the rating scale.

On the other hand, the subjects' perceptions of the quality of the average infant's sleep were influenced more by the full-term or preterm appearance of the observed infant than by the state pattern depicted by the videotaped infants. Unfortunately, it is not possible to determine whether the subjects were responding to the particular

unique characteristics of the individual infants or to the more general qualities associated with preterm or full-term birth, since only one preterm and one full-term infant were studied.

The subjects' reactions to the infants, in contrast to their perceptions and impressions of the infants, were dependent in a variety of ways on the state pattern depicted by the infants in the videotapes. Subjects who viewed either infant in the full-term state pattern rated themselves as feeling happier and as wanting to play and to vocalize more with the infant than did those subjects who observed either infant in the preterm or immature state pattern. The results indicated that the mature state pattern led to more positive reactions overall to the infants than the immature sleep-wake cycle did.

Taken together, these data suggest that both the variable of preterm or full-term infant appearance and the variable of immature or mature infant state pattern influence adults' impressions or perceptions of infants. It appears that some aspects of adults' perceptions of infants are determined by physical appearance attributes while others are more closely linked to behavioral state qualities. However, these data indicate that adult reactions and feelings toward infants rely more on the behavioral state qualities than they do on physical appearance

attributes, at least in those areas assessed by the rating scale. The sleep-wake patterns of full-term and preterm infants do affect adults' reactions to the babies. An infant's behavioral state pattern in a potent factor in the baby's interactions with others; depending on his state characteristics, the infant elicits different interaction behaviors from adults.

REFERENCE NOTES

1. Nagy, J. N., Holmes, D. L., Danko, M., and Slaymaker, F.. The effects of perinatal events, time, and developmental progress on maternal perceptions of their infants. Manuscript submitted for publication, 1983.

2. Holmes, D. L., Nagy, J. N., Slaymaker, F., McNeal, S. R., and Gardner, T.. State characteristics in full-term and preterm infants. Paper presented at meetings of Southwestern Society for Research in Human Development, Lawrence, Kansas, March, 1980.

3. Holmes, D. L., Nagy, J. N., Sosnowski, R., Slaymaker, F., and Pasternak, J. F.. In preparation.

REFERENCE LIST

Bennett, S.. Infant-caregiver interactions. Journal of American child psychiatry, 1971, 10, 321-335.

Birch, H. & Gussow, G. D.. Disadvantaged children. New York: Grune & Stratton, 1970.

Blake, A., Stewart, A., & Turcan, D.. Parents of babies of very low birthweight: Long term follow up. In Parent-infant interaction Ciba Symposium 33. Amsterdam: Elseview Publishing Company, 1975.

Brazelton, T. B.. Neonatal behavioral assessment scale. Philadelphia: J. B. Lippincott Company, 1973.

Brazelton, T. B.. Parental perceptions of infant manipulations: The effects on parents of inclusion in our research. In V. L. Smeriglio (Ed.), Newborns and parents: Parent-infant contact and newborn sensory stimulation. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1981.

Caputo, D. V., Goldstein, K. M., and Tabu, H. B.. The development of prematurely born children through middle childhood. In T. M. Field, A. M. Sostek, S. Goldberg, and H. H. Shuman, (Eds.), Infants born at risk: Behavior and development. New York: Spectrum Publications, Inc., 1979.

Cohen, E. S. and Beckwith, L.. Maternal language in infancy. Developmental psychology, 1976, 12, 371-372.

Corter, C. M., Trehub, S., Boukydis, C. F. Z., Ford, L., Celhoffer, L., and Mende, K.. Nurses' judgments of the attractiveness of premature infants. Infant behavior and development, 1978, 1, 373-380.

DiVitto, B. and Goldberg, S.. The effects of newborn medical status on early parent-infant interaction. In T. M. Field, A. M. Sostek, S. Goldberg, and H. H. Shuman (Eds.), Infants born at risk: Behavior and development. New York: Spectrum Publications, Inc., 1979.

Elmer, E. and Gregg, C. S.. Developmental interactions of abused children. Pediatrics, 1967, 40, 596.

Emde, R. N., Gaensbauer, T. J., and Harmon, R.. Emotional expression in infancy: A probehavioral study. Psychological issues monograph, 1976, 10 (37).

Emde, R. N. and Robinson, J.. The first two months: Recent research in developmental psychobiology and the changing view of the newborn. In J. Noshpitz and J. Call (Eds.), Basic handbook of child psychiatry. Volume 1: Development. New York: Basic Books, 1979.

Field, T. M.. Effects of early separation, interactive deficits, and experimental manipulations on infant-mother face-to-face interaction. Child development, 1977, 48, 763-771.

Field, T. M.. Games parents play with normal and high-risk infants. Child psychiatry and human development, 1979a, 10, 41-48.

Field, T. M.. Interaction patterns of high-risk and normal infants. In T. M. Field, A. M. Sostek, S. Goldberg, and H. H. Shuman (Eds.), Infants born at risk: Behavior and development. New York: Spectrum Publications, 1979.

Field, T. M.. Interactions of high-risk infants: Quantitative and qualitative differences. In D. B. Sawin, R. C. Hawkins, L. O. Walker, and J. H. Penticuff (Eds.), Exceptional infant, Volume 4: Psychosocial risks in infant-environment transactions. New York: Brunner/Mazel, Inc., 1980a.

Field, T. M.. Interactions of preterm and term infants with their lower- and middle-class teenage and adult mothers. In T. M. Field, S. Goldberg, D. Stern, and A. M. Sostek (Eds.), High-risk infants and children: Adult and peer interactions. New York: Academic Press, 1980b.

Field, T. M.. Maternal stimulation during infant feeding. Developmental psychology, 1977b, 13, 539-540.

Field, T. M.. Visual and cardiac responses to animate and inanimate faces by young term and preterm infants. Child development, 1979c, 50, 188-195.

Field, T. M. and Ignatoff, E.. Videotaping effects on the behaviors of low income mothers and their infants during floor-play interactions. Journal of applied developmental psychology, 1981, 2, 227-235.

Frodi, A., Lamb, M., Leavitt, L. A., Donovan, W. L., Neff, C., and Sherry, D.. Fathers' and mothers' responses to the facts and cries of normal and premature infants. Developmental psychology, 1978, 14 (5), 490-498.

Goldberg, S., Brachfeld, S., and DiVitto, B.. Feeding, fussing, and play: Parent-infant interaction in the first year as a function of prematurity and perinatal medical problems. In T. M. Field, S. Goldberg, D. Stern, A. M. Sostek (Eds.), High-risk infants and children: Adult and peer interactions. New York: Academic Press, 1980.

Holmes, D. L., Nagy, J. N., and Pasternak, J. F. The development of infants born at risk. New Jersey: Lawrence Erlbaum and Associates, In press, 1982.

Hunter, R. S., Kilstrom, N., Kraybill, E. N., and Loda, F.. Antecedents of child abuse and neglect in premature infants: A prospective study in a newborn intensive care unit. Pediatrics, 1978, 61, 629-635.

Klaus, M. H., Kennell, J. H., Plumb, N., and Zuelke, S.. Human maternal behavior at first contact with her young. Pediatrics, 1970, 46, 187-192.

Klein, M. and Stern, L.. Low birth weight and the battered child syndrome. American journal of diseases of children, 1971, 122, 15.

Korner, A. F.. State as variable, as obstacle, and as mediator of stimulation in infant research. Merrill-Palmer quarterly, 1972, 18, 77-94.

Leifer, A. D., Leiderman, P. H., Barnett, C. R., and Williams, J. A.. Effects of mother-infant separation on maternal attachment behavior. Child development, 1972, 18, 95-121.

Lewis, M.. State as an infant-environment interaction: An analysis of mother-infant interaction as a function of sex. Merrill-Palmer quarterly, 1972, 18, 95-121.

Lynch, M. A. and Roberts, J.. Predicting child abuse:

Signs of bonding failure in the maternity hospital. British medical journal, 1977, 60, 624-626.

Pratt, K. C.. The effects of repeated auditory stimulation upon the general activity of newborn infants. Journal of genetic psychology, 1934, 44, 96-116.

Stern, D. N.. The first relationship: Infant and mother. J. Bruner, M. Cole, and B. Lloyd (Eds.), The developing child series. Cambridge: Harvard University Press, 1977.

Wolff, P. H.. The causes, controls, and organization of behavior in the neonate. Psychological issues monographs, 1966.

Wolff, P. H.. Observations on newborn infants. Psychosomatic medicine, 1959, 21, 110-118.

Zeskind, P. S.. Adult responses to cries of low and high risk infants. Infant behavior and development, 1980, 3, 167-177.

Zeskind, P. S.. Behavioral dimensions and cry sounds of infants of differential fetal growth. Infant behavior and development, 1981, 4, 279-306.

APPENDIX A

RATING SCALE

Subject number _____ Age _____ Sex _____

Are you a parent? _____

Amount of experience with infants:

Much 1 2 3 4 5 6 7 8 None

Circle the number between the two phrases or words for each item which you think best describes the infant you viewed in the videotape.

Infant in videotape:

1.	calm	1 2 3 4 5 6 7 8	excitable
2.	sleeps poorly	1 2 3 4 5 6 7 8	sleeps well
3.	small amount of crying	1 2 3 4 5 6 7 8	large amount of crying
4.	alert and active	1 2 3 4 5 6 7 8	passive
5.	unhealthy	1 2 3 4 5 6 7 8	healthy
6.	different	1 2 3 4 5 6 7 8	normal
7.	small for age	1 2 3 4 5 6 7 8	big for age
8.	happy	1 2 3 4 5 6 7 8	unhappy
9.	"difficult" baby	1 2 3 4 5 6 7 8	"easy" baby
10.	attractive	1 2 3 4 5 6 7 8	unattractive

Now, circle the number for each item which you think best describes the average infant.

		Average infant:	
11.	calm	1 2 3 4 5 6 7 8	excitable
12.	sleeps poorly	1 2 3 4 5 6 7 8	sleeps well
13.	small amount of crying	1 2 3 4 5 6 7 8	large amount of crying
14.	alert and active	1 2 3 4 5 6 7 8	passive
15.	unhealthy	1 2 3 4 5 6 7 8	healthy
16.	different	1 2 3 4 5 6 7 8	normal
17.	small for age	1 2 3 4 5 6 7 8	big for age
18.	happy	1 2 3 4 5 6 7 8	unhappy
19.	"difficult" baby	1 2 3 4 5 6 7 8	"easy" baby
20.	attractive	1 2 3 4 5 6 7 8	unattractive

Next, circle the number between the two phrases or words for each item which you think best describes the way the infant in the videotape made <u>you</u> <u>feel</u>.

		Infant in videotape:	
21.	unhappy	1 2 3 4 5 6 7 8	happy
22.	want to interact with the baby	1 2 3 4 5 6 7 8	do not want to interact with the baby
23.	annoyed	1 2 3 4 5 6 7 8	not annoyed
24.	interested in the baby	1 2 3 4 5 6 7 8	uninterested in the baby
25.	want to hold the baby	1 2 3 4 5 6 7 8	do not want to hold the baby

26.	want to play with the baby	1 2 3 4 5 6 7 8	do not want to play with the baby
27.	want to vocalize with the baby	1 2 3 4 5 6 7 8	do not want to vocalize with the baby
28.	nervous	1 2 3 4 5 6 7 8	comfortable

Now, circle the number for each item which you think best describes the way the average infant generally makes <u>you feel</u>.

		Average infant:	
29.	unhappy	1 2 3 4 5 6 7 8	happy
30.	want to interact with the baby	1 2 3 4 5 6 7 8	do not want to interact with the baby
31.	annoyed	1 2 3 4 5 6 7 8	not annoyed
32.	interested in the baby	1 2 3 4 5 6 7 8	uninterested in the baby
33.	want to hold the baby	1 2 3 4 5 6 7 8	do not want to hold the baby
34.	want to play with the baby	1 2 3 4 5 6 7 8	do not want to play with the baby
35.	want to vocalize with the baby	1 2 3 4 5 6 7 8	do not want to vocalize with the baby
36.	nervous	1 2 3 4 5 6 7 8	comfortable

What sex do you think the baby in the videotape is? _____

APPROVAL SHEET

The thesis submitted by Linda Vest Klein has been read and approved by the following committee:

Deborah L. Holmes, Ph.D., Director
Associate Professor in Psychology

Jill N. Nagy, Ph.D.
Assistant Professor in Psychology

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

March 16, 1983
Date

Deborah L. Holmes, PhD
Director's Signature