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PERCEPTIONS OF INFANTS AS A

FUNCTION OF ADULT AND INFANT CHARACTERISTICS

A DISSERTATION SUBMITTED TO

THE FACULTY OF THE DIVISION OF THE SOCIAL SCIENCES

IN CANDIDACY FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

BY

CHRISTINE GESELL ANDERSON

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CHAPTER I

INTRODUCTION

Researchers have attempted to identify factors that
place some parent-infant dyads at risk for later
developmental problems. The current developmental models
suggest that developmental outcome is determined by the
adult, the child, the environment, and their interactions.
There is some empirical evidence suggesting that a
"hypersensitivity" in maltreating parents appears to play a
role in negative perceptions of children and the parenting
experience. There also is empirical evidence suggesting
that infant prematurity and infant attractiveness are
related to adult perceptions of infants and thus, potential
caregiving behaviors. This study was designed to
investigate the relationships between adult and infant
characteristics and adult perceptions of infant
attractiveness, infant age, and infant emotional state.

Undergraduate college students were asked to rate
photographs of infants on attractiveness, age appearance,
and emotional state. The photographs of preterm and full-
term infants were taken at four ages; 41-42 weeks
conceptional age (C.A.), and 2 months, 4 months, and 6
months (corrected for gestational age at birth for the

preterm infants). The research participants were blind to the birth condition (i.e., whether preterm or full-term), sex, and age of the photographed infants. In addition, participants were asked to complete the Child Abuse Potential Inventory which assessed attitudes toward parenting and children, and personality traits.

CHAPTER II

REVIEW OF LITERATURE

Child maltreatment has been increasingly recognized as
a complex phenomenon involving characteristics of the adult,
the child, the environment, and their interactions (Belsky,
1980; Cicchetti, 1989; Emery, 1989; Wolfe, 1985). One
factor that has been associated with dysfunctional parenting
is unrealistic parental expectations of children's behavior
(Azar, Robinson, Hekinnian, & Twentyman, 1984; Newberger &
Cook, 1983; Twentyman & Plotlin, 1982). These expectations
do not appear to be related to knowledge of developmental
milestones (Kravitz & Driscoll, 1983) but instead to
inappropriate judgments of more complex competencies. For
example, Azar et. al. examined the differences between
maltreating and non-maltreating mothers on two measures of
parental expectations: the knowledge of the age when
various developmental milestones are acquired (e.g., ability
to count and climb stairs); and judgments regarding more
complex behaviors of children (e.g., the appropriateness of
punishing a nine-month old for crying too much, expecting a
five year old to be responsible for the care of younger
siblings, and expecting a three year old to play quietly for

extended periods of time). Results showed no differences between the parental groups on knowledge of age appropriate developmental milestones. However, a significant group difference was obtained on the more complex child behavior measure showing maltreating mothers to have unrealistic expectations of child behavior in this domain. While research has identified these misperceptions, very little is known about what might account for them.

One condition suspected of contributing to inappropriate parental expectations has involved examining parental perceptions of childrearing practices. Studies have found that maltreating parents are less satisfied with their children and perceive childrearing to be more difficult than non-maltreating parents. In addition, maltreating parents report less enjoyment in the parental role and have a greater tendency to express negative affect toward their children (Trickett, Abner, Carlson, & Cicchetti, 1991; Trickett & Sussman, 1988).

Findings that maltreating parents may be negatively biased toward their own children and in their childrearing practices may be related to their reactions to children in general. Frodi and Lamb (1980) examined whether maltreating mothers respond atypically to infant signals. Maltreating and non-maltreating mothers were shown videotapes of crying and smiling infants and the mothers' physiological responses (i.e., heart rate, blood pressure, and skin conductance) to

the infant stimuli were measured. In addition, subjects rated their emotional responses to each infant condition. Findings showed that maltreating mothers were more physiologically aroused (i.e., increased heart rate, blood-pressure, and skin conductance) than non-maltreating mothers when exposed to crying infants. They also reported less sympathy and more annoyance toward the child. Moreover, the researchers found minimal changes in the physiological arousal in maltreating mothers response to either a smiling or crying infant, whereas the non-maltreating mother showed no arousal or declines in arousal when viewing a smiling infant. These findings suggest that maltreating parents may find any elicitation of parent-infant social interaction to be aversive.

However, this physical reaction of maltreating parents may not be limited to situations involving parent-infant interactions. Bauer and Twentyman (1985) examined parental reactions to a number of aversive stimuli. Maltreating and non-maltreating mothers were exposed to both child-related stressful stimuli (i.e., situations of stressful parent-child interactions) and non child-related stressful stimuli (i.e., fire alarm and car horns honking). Results showed that in the child-related situations, the maltreating group consistently viewed the children as acting intentionally to annoy them. Moreover, these mothers reported more annoyance across both the social and nonsocial stressors, supporting

the existence of a generalized pattern of hyperresponsivity
to a variety of situations in maltreating parents.
Consistent with these reports of heightened physiological
responses, other studies have indicated that maltreating
parents report experiencing more stress and feeling more
depressed, anxious, and emotionally distressed than non-
maltreating parents (e.g., Egeland, Jacobvitz, & Sroufe,
1988; Lahey, Conger, Atkeson, & Treiber, 1984).

The ethological theory provides one explanation for
these physiological and perceptual differences found in
maltreating parents. Ethologists have suggested that
through the evolutionary process, humans are predisposed
with innate releasing mechanisms (IRMs) that are
automatically triggered by specific environmental stimuli.
One such IRM is the adult response to infants which
functions to promote the survival of the infant and in turn
the species. Specifically, infant characteristics serve as
signals that elicit innate caretaking behaviors and
affective responses in adults. From this perspective, the
heightened physiological responses of maltreating parents
may interfere or alter this natural process and result in
faulty interpretations of the situations. These
interpretations would then be manifested in behavior.
Support for this idea has been found in studies
investigating the parent-child interactions of maltreating
families. Findings in this area have indicated that,

overall, maltreating parents interact with their children at a lower rate (Burgess & Conger, 1978); display fewer positive behaviors (Burgess & Conger, 1978; Kavanagh, Youngblade, Reid & Fagot, 1988); and display more aversive behaviors (Bousha & Twentyman, 1984; Lahey, Conger, Atkeson, & Treiber, 1984).

One interpretation of these data is that dysfunctional parenting may be due in part to a pre-existing condition in the parent that manifests itself in negative perceptions and behavior toward children. While research indicates that this may be the case, the majority of studies on child maltreatment have been conducted with adults who have already engaged in child maltreatment, making it difficult to ascertain whether these dysfunctional parental characteristics exist prior to parenting or are a result of their parenting experiences. This issue is significant because the manner in which the parent-child relationship develops is not solely dependent on characteristics of the parent but also is influenced by characteristics of the child.

There is empirical evidence that attractiveness (or cuteness) of the infant is one among numerous factors that may influence the parent-infant relationship. Examining a possible link between infant attractiveness and inappropriate parenting may be of considerable significance to understanding the etiology of unrealistic expectations of

children's behavior.

   As stated before, ethologists have suggested that specific infant physical and behavioral characteristics are releasers of caregivers' approach and care behavior, as well as suppressors of aggressive behavior. For example, infants possessing "babyish" facial features (large eyes placed in the middle of the face, round heads and small noses, mouths and chins) are preferred by adults (Sternglanz, Gray, & Murakami, 1977). Adults rate infants with these features as more attractive and tend to look longer at them than the faces of infants not possessing these specific characteristics (Hildebrandt & Fitzgerald, 1978, 1979a, 1981). In addition to the role of physical attributes, there is evidence that behavioral attributes can also affect ratings of attractiveness. For example, positive infant expressions (e.g., smiling, happy, cheerful) are rated as more attractive than negative expressions (e.g., crying, unhappy) (Hildebrandt, 1983; Holmes, Reich, & Lauesen, 1987; Karraker & Stern, 1984; Power, Hildebrandt, & Fitzgerald, 1982),

   In addition to the impact of physical characteristics on adult perceptions of infant attractiveness, these characteristics also affect adults' expectations for the infants' behavior and development. Stephen and Langlois (1984) showed a sample of African-American, Caucasian, and Mexican-American male and female adults photographs of

infants (same ethnic groups as the adults) taken at three ages: newborn, three months, and nine months. The adults rated the infants on attractiveness and on behavioral and developmental traits. The findings showed that on measures of "smart", "likeable", "good" and "causes parents problems", there was a positive bias for the physically attractive infants which was present across ethnic groups and ages.

In a similar study, Ritter, Langlois, and Casey (1991) investigated the relationships among infant age appearance and facial attractiveness, and adult expectations of the developmental maturity of infants differing on these dimensions. Parents and non-parents shown pictures of six month old infants were asked to rate the infants on attractiveness and age appearance. The adults also rated the competence of the infants in the areas of communication skills, motor abilities, social skills, cognitive level, and self-help skills. Results showed that both parents and non-parents rated the unattractive infants as older than their attractive age-mates. Furthermore, the parents overestimated the developmental competence of the unattractive infants, with unattractive females being perceived as more capable in communication and cognitive skills than the attractive females, and both unattractive female and male infants rated as more capable in motor abilities than attractive male and female infants. These

researchers propose that their findings suggest that less attractive and older appearing children may therefore become "trapped in a vicious cycle in which adults hold unrealistic expectations concerning the behavior of these children, and, in turn, the children's actual behavior appears to be immature." (p. 80). Therefore, their failure to behave as expected in combination with the negative evaluations unattractive children elicit, may result in even more dysfunctional evaluations by adults and in turn have a negative influence on adult-child interactions.

These data suggest that infants who do not share facial features associated with "babyishness" may be judged as less attractive and be less successful in eliciting appropriate nurturant responses from adults. Furthermore, the data suggest that the relationship between facial attractiveness and age-appearance may partly account for unrealistic expectations of children's competence. This suggests that particular populations of infants who, for one reason or another, do not possess these characteristics might be at risk because they will be less successful at eliciting such nurturing responses.

One such infant population may be premature infants who at birth are commonly described as looking like "little old men." In fact, Maier, Holmes, Slaymaker and Reich (1984) found that premature infants lack the "babyish" facial features found in full-term infants. This study first

examined the specific facial features of young preterm
infants (31-34 weeks gestational age), older preterm infants
(35-37 weeks gestational age) and full-term infants (40
weeks gestational age) and then used these data to generate
composite drawings depicting these three groups of infants.
These drawings were then used to elicit adults' perceptions
of attractiveness. The results of this study indicated that
preterm infants have significantly smaller eyes and narrower
heads than full-term infants; the eyes of the preterm
infants are placed proportionally higher in the face and
closer to the sides of the face; and the distance between
their noses and mouths is proportionally greater than for
the full-terms. Maier et al., also found that college-age
adults evaluated the preterm infants less positively than
the full-term infants along several dimensions including
attractiveness, behavioral functions (e.g., would eat well-
would not eat well), and ability to elicit interactive
behaviors from the adult raters.

In a subsequent study, Holmes, Reich, and Lauesen
(1987) investigated whether or not these earlier differences
could be attributed to the fact that at the time of the
photographs the preterm infants were younger in post-
conceptional age than the full-term infants. Furthermore,
they examined the effects of infant facial expression on
adult ratings of infants. College-age adults rated
photographs (instead of composite drawings) of smiling and

neutral expressions of four month old preterm and full-term
infants (corrected age for the preterm infants) in terms of
perceived attractiveness, behavioral competence of the
infants, and behavioral inclinations toward the infants.
Findings were consistent with those of the earlier study.
The full-term infants were consistently judged more
positively than the preterm infants in all dimensions even
though the infants were all four months old (preterm age
corrected for gestational age at birth). Moreover, the
smiles of the preterm infants were rated as less attractive
than those of the full-term infants. Holmes and her
colleagues suggest that the difference in attractiveness is
not a function of conceptional age per se but, rather
appears to be related to some aspect of the premature birth.
Moreover, these findings indicate that the differences
persist to at least four months of age, thereby heightening
the possibility that their effects could affect caregiver
responses over a prolonged period of time.

In a similar study, Frodi, Lamb, Leavitt, Donovan,
Nett, and Sherry (1978) examined whether parents perceive
differences in the cry and appearance of premature infants
and full-term infants. In this study, parents viewed
videotapes of infants who were crying or quiescent. Half of
the parents saw a preterm infant and the other half a full-
term infant. Sound tracks were dubbed so that half of the
full-term infants and half of the preterm infants "emitted"

the cry of a normal full-term infant, while the other half emitted the cry of a premature infant. Physiological measures were gathered from parents as well as ratings on their mood, perceived sex of the infant, how pleasant they perceived the infant, and how likely they were to interact with the infant. Results showed that the cry and appearance of the premature infant were perceived as more aversive than those of the full-term infant. Moreover, the parents reported that they were less eager to interact with the premature infant, whom they rated as less pleasant. Based on these studies, it appears that all adults (including parents) perceive premature infants as less attractive and as possessing less positive attributes than full-term infants.

The relationship between the attractiveness of an infant and actual caregiver-infant interactions was examined by Cleland, Stilson and Reich (1992). As previously mentioned, Holmes et al. (1987) found college students who had no knowledge of infants birth histories rated the faces of preterm infants as less attractive, less likeable, and less cute than the faces of full-term infants. Cleland et al. found significant positive correlations between the ratings gathered from the Holmes study and the actual interactions of the same infants with their mothers. Specifically, as the ratings of infant attractiveness, likeablity and cuteness decreased so did the mother-infant

interactions. Based on their findings, these authors suggested that the responsiveness of the caregiver was related to the physical characteristics of the faces of their infants.

As previously discussed, the Maier, et al. (1984) study found that the faces of preterm infants are narrower than those of full-term infants at birth. Anderson, Holmes and Klocek (1990) examined whether the facial features of preterm infants continued to differ from those of full-term infants as they grew older (when preterm age was corrected for gestational age at birth). Photographs of preterm and full-term infant faces were projected onto a flat vertical surface and the facial features found by Maier et al. to differentiate among preterm and full-term infants were measured. Results indicated that, overall, preterm infants had narrower faces than full-term infants. Moreover, while increased age resulted in increased roundness for the full-term infants, increased age was associated with increased narrowness for preterm infants.

The results of these studies indicate that infant prematurity may affect the perceptions and responses of adults who are unrelated to the infants and who viewed the infants passively. Although not directly tested, these studies also suggest that perhaps these same effects may carry over to caregiver behavior. Were this the case, one might assume that the abnormal facial appearance (i.e., less

"babyishness" features) of preterm infants may be one factor
contributing to the high rate of parent-infant disturbance
in families with preterm infants (for a review, see Frodi,
1981). McCabe (1988) investigated the way in which facial
features may serve as cues about age, maturity, and
competence and found that maltreated children have smaller
craniofacial proportions that make them appear older than
those of the same age, matched non-maltreated children.
McCabe suggests that adults may have unrealistic
expectations for a child perceived as older, and that the
child's inability to meet those expectations might elicit
disciplinary or abusive responses.

<u>Summary</u>

The present literature review has indicated several
important implications for the understanding of the
developing parent-infant relationship and in particular
parental unrealistic expectations of children's
competencies. First, dysfunctional parents appear to be
hyperresponsive to children. This heightened response may
negatively influence their perceptions of and behaviors
toward children. Second, facial features and expressions of
infants influence parental perceptions of infant
attractiveness. This appears to have an impact on the
interactions and the developing relationships of parent-
infant dyads. Third, premature infants have atypical facial
features, have been rated by adults as less attractive and

as less able to elicit caregiving behaviors. The
ethological perspective would predict that the less
"babyish" facial features of premature infants would
interfere with their ability to elicit caregiving behaviors
and positive affective responses in adults. In addition,
characteristics in adults such as high arousal levels may
inhibit or alter the elicitation of caregiving behaviors in
response to children. Moreover, the ethological perspective
would predict that the combination of these conditions would
be possible factors that place these adult-infant dyads at
risk for developing dysfunctional relationships.

Since there appear to be no studies that bridge these
two areas of research, there remains a need for exploration
to determine if, in fact, the joint characteristics of the
adult and the infant influence adult perceptions of the
infant. The purpose of this study was to address this
relationship among adult and infant characteristics and
adult perceptions. The major purpose was to determine
whether adults' perceptions of infant attractiveness varied
as a function of both adult characteristics that have been
found in maltreating parents and infant characteristics. It
was proposed that both infant and adult characteristics
would contribute to adult ratings of infant attractiveness.
Specifically, it was predicted that preterm infants would be
viewed as less attractive by all adults and that adults with
personality profiles characteristic of physically abusive

parents would rate all infants as less attractive than would
adults whose personality profiles were not similar to those
characteristic of physically abusive parents. In addition,
the investigator was interested in determining whether
perhaps these two variables interact in such a manner that
ratings of infant attractiveness are particularly depressed
in cases where an adult with an abusive profile is
responding to an infant with preterm facial characteristics.

In addition, adult perceptions of infant age and
emotional state were examined to determine if these
perceptions were also susceptible to influence by adult and
infant characteristics.

Hypotheses

It was expected that the following outcomes would
occur: (a) adults who had characteristics found in
maltreating parents would perceive infants as less
attractive (cute and likeable) and older than adults who did
not have these characteristics; (b) preterm infants would be
perceived as less attractive (cute and likeable) than full-
term infants; (c) infants with smiling faces and older
infants would be rated more positively than non-smiling and
younger infants; (d) perceptions of infant emotional state
would be related to adult characteristics; and (e) the
effects of infant group and of infant facial condition would
be more pronounced for adults with personality profiles
characteristic of maltreating adults than for adults without

such personality profiles.

CHAPTER III

METHOD

Subjects

Participants were 310 undergraduate students at Loyola University of Chicago completing a course requirement in introductory psychology. The participants were given an explanation of the procedures to be followed, the possible benefits and the risks of the study, and provided informed consent prior to participation. Of the 310 subjects, 56 were eliminated from the study due to missing data and/or invalid child abuse potential profiles (i.e., elevated scores in faking good, faking bad, random responses, excessive blanks). The remaining study sample consisted of 250 undergraduate students (79 males, 171 females; mean age 18.62 years, age range 17 - 39; 20 African-Americans, 190 Caucasians, 4 Hispanics, 21 Asians, 1 American Indian, 14 with unreported racial group). These participants were assigned to one of two adult groups as determined by their composite score on the Child Abuse Potential Inventory (CAP). The high scoring group (N = 58) consisted of subjects who reached or were above the cut-off score of 215 which "indicates that the examinee has characteristics

similar to known, active physical child abusers" (Milner, 1986, p. 12). This group will be referred to as High Profile Adults. The low scoring group consisted of the remaining adult subjects (N = 192) and will be referred to as Low Profile Adults.

Environment and Equipment

A classroom approximately 15 x 18 ft was utilized for the testing procedures. Chairs with desk tops were positioned so that each participant had a clear view of a projection screen at one end of the room. A Kodak (model 760 H) slide projector was used to show subjects the infant stimuli slides. Participants were tested in 10 groups of 25 students (total 250).

Infant Stimuli

Stimuli consisted of 280 photographs (slides) of the faces of 20 preterm and 20 full-term infants taken at four ages: 41-42 weeks conceptional age, 2 months, 4 months and 6 months.[1] Except at 41-42 weeks conceptional age (when only neutral photographs were taken), each of the 40 infants provided two photographs (one smiling and one neutral) at each of the remaining four ages. Thus, each infant contributed seven photographs to the total stimulus pool.[2]

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[1] The photographs of the infants were used in a previous report (Anderson, Holmes, & Klocek, 1990).

[2] Seven pictures were missing due to problems with the flash apparatus (3 photos), no clear smile (3 photos), missed appointment (1 photo). The seven missing infant stimuli were replaced randomly from stimuli within that cell so that each

Photographs were taken in the infants' homes with a 35mm
camera. Although an electronic flash was used, lighting
varied because of differences in natural light within the
homes and the use of two different flash attachments. There
was no evidence that this variation was systematic across
groups and ages (Chi Square (df,3) = 1.64, n.s.). To
control for any gender cues, all infants were photographed
in an infant seat, wearing a white t-shirt. Distance from
the top of the infant seat to the camera lens was held
constant at 73 cm. Multiple photographs (mean number of
photographs per visit = 8) were taken of the individual
infants at each age. All photographs were viewed by the
investigator and an assistant blind to infant birth
condition and infant age who selected the two photographs
which best fit the following criteria: correct orientation
(i.e., full frontal face); a "neutral" face (i.e., eyes
open, alert but no particular emotion present); and a
"smile" face (i.e., mouth in clear smile position, eyes open
and "bright"). In cases where there was a discrepancy,
graduate students blind to infant characteristics made the
final selection. Because infants do not smile spontaneously
at 41-42 weeks conceptional age, only neutral photographs
were obtained at that particular visit. Therefore, of the
280 photographs, 160 showed a neutral face and 120 showed a

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participant saw the appropriate number of stimuli from each
cell.

All infants (both preterm and full-term) were born at Evanston Hospital between March 1987 and November 1987. All infants met the following criteria: weight appropriate for gestational age at birth; stable medical condition upon discharge; Caucasian; and no facial anomalies. Infants were recruited through random examination of medical records. Once a particular infant met the criteria, parents were contacted and parental informed consent was obtained. Approximately 33% of the selected parents of full-term infants declined to participate in the study. Two primary reasons were given for refusal to participate: (a) the time commitment necessary to complete the study, and (b) the first photograph would have to be taken soon after delivery. Of the preterm infants' parents, approximately 20% declined participation in the study. The primary reason for refusal in this was the length of time necessary to complete the study. Of the infants who participated, the following characteristics of each group were determined.

Preterm group. The preterm group consisted of 20 infants (10 female, 10 male). Characteristics of this group include: gestational ages of less than 36 weeks (mean gestational age = 32.3 weeks, range = 28 to 35 weeks); birth weights less than 2501 grams (mean birth weight = 1792.1 g, range = 1085 to 2500 g); birth lengths less than 49 cm (mean birth length = 42.5 cm, range = 37 to 48 cm); and birth head circumference less than 42 cm (mean birth head circumference

circumference less than 42 cm (mean birth head circumference = 30.6 cm, range = 26 to 41 cm).

Full-term group. The full-term group consisted of 20 infants (10 female, 10 male) with normal perinatal histories, born at term (i.e., 39-42 weeks gestation). Birth weights of the full-terms ranged between 2724 to 4554 grams with a mean of 3524.3 grams, birth lengths ranged between 49 to 56 cm with a mean of 52.3 cm, and birth head circumferences ranged between 34 to 40 cm with a mean of 35 cm.

A MANOVA assessed group and sex differences in birth weight, birth length, and birth head circumference. A significant main effect of group was found ($F(3, 29) = 46.57$, $p < .001$). The two groups differed in birth weight ($F(1, 31) = 146.65$, $p < .001$); birth length ($F(1, 31) = 81.01$, $p < .001$); and birth head circumference ($F(1, 31) = 25.66$, $p < .001$).[3] Even with adjusted alphas using ANOVAS, the differences between these variables would be significant. Neither the main effect for sex nor the interaction between sex and group were obtained.

At each subsequent age (two, four, and six months (corrected for preterm infants)), each infant was measured in terms of weight, length, head circumference, distance from ear to ear, and distance from the back of the head to

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3 Degrees of freedom reduced due to missing data for five subjects.

significant effects or interactions for group or sex.

Infant Rating Form

The infant rating form was designed to assess adult perceptions of infant characteristics. Participants were asked to rate the infants depicted in the photographs on four 7-point scales: "How cute is this infant?" (7 = cute, 1 = ugly); "How old is this infant?" (7 = seven months or more, 6 = six months, 5 = five months, 4 = four months, 3 = three months, 2 = two months, 1 = one month or less); "How likeable is this infant?" (7 = very likeable, 1 = not likeable); and "What is the emotional state of this infant?" (7 = happy, 1 = unhappy). These infants characteristics were selected based upon past studies indicating that infant facial characteristics were related to perceptions of attractiveness. The investigator also wanted to examine the accuracy of adult ratings of infant emotional state, as this trait has been found to be misperceived in the maltreating population. In addition, the relationship between adult characteristics and perceptions of infant age was of interest.

Child Abuse Potential Inventory

The inclusion of this instrument allowed the assessment of parenting styles and parental traits such that analyses could be performed to assess relationships between varying parental traits and ratings on infant characteristics. Since dysfunctional parenting has been associated with a

variety of adult characteristics, an inventory that assessed more than one factor was needed. The Child Abuse Potential Inventory (CAP) assesses a constellation of traits that have been found in maltreating parents (Milner, 1986). Specifically, it assesses levels of distress, rigidity, unhappiness, problems with self and child, problems with family, and problems from others, resulting in a scale which provides a continuum from nurturing to maltreating parenting styles.

This inventory is a 160-item self-administered questionnaire designed to measure an individual's parenting potential. Items are answered in a forced-choice format (i.e., agree - disagree). The questionnaire takes a college-educated person about twelve to fifteen minutes to complete and a high school educated person about fifteen to twenty minutes.

Validity data (see, for a review, Milner, 1986) indicate that the inventory is effective in discriminating maltreating parents from a variety of non-maltreating populations with an approximate correct classification rate of 94%. Reliability data indicate that KR-20 reliability coefficients for the abuse scale range from .92 to .96 across a variety of control, high risk, and abuse groups. Test-retest data for one day and one week periods are .94 and .90 respectively.

The CAP has been normed on a wide range of populations

(e.g., maltreating parents, at risk parents, non-maltreating parents, daycare workers, nurturing parents) including college students. Longitudinal data indicate that the future prediction of physical abuse of at-risk parents based on CAP scores is 17.5%. The concurrent validity for the CAP using court referred abusers and general population parents has been found to be 49%. Since only one of the participants was a parent, non-parent participants were instructed to answer parent-related items as if they were parents (per conversation with Milner, 1986).

Procedure

This study assessed the relationship between actual and perceived infant characteristics and adult characteristics in a 2 (infant birth condition) X 4 (infant age) X 2 (infant expression) X 2 (adult groups) design. The two levels of infant birth condition were full-term (40 weeks gestation) and preterm (35 weeks or less gestation) birth. The four levels of infant age were 41-42 weeks conceptional age, 2 months, 4 months and 6 months (corrected for gestational age at birth for the preterm infants).[4] The two infant expressions were neutral and smiling. The two adult groups (high, low) were determined by each subject's composite score on the Child Abuse Potential Inventory (Milner, 1986).

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[4] Data gathered from the 41-42 weeks conceptional age were discussed in a previous report (Anderson, 1990).

Due to the large number of infant stimuli, it was not possible to show all stimuli to all subjects. Rather, each participant viewed 56 stimuli. The 280 infant photographs were randomly assigned without replacement into five groups of 56 pictures so that each group had equal representation of infant sex, birth condition, age, and facial expression.[5] As a result, each infant condition was viewed by an equal number of participants.

The participants were tested in ten groups of 25 students (total 250), with each group tested separately. They were given individual packets containing 56 Infant Rating Forms and the CAP questionnaire. Each packet and its contents were marked with individual identification numbers to ensure confidentiality.

When all participants within each group were seated and facing the projection screen, they were instructed that they would see a total of 56 different pictures of babies. For each baby, they were to record the baby's number (shown on each slide) at the top of the Infant Rating Form, and then to complete the form for that baby.

The first slide was shown and when all participants had completed that rating form, the next slide was shown. This process was repeated until all slides and rating forms were completed. The viewing and rating time per slide was 30

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[5] The seven missing infant stimuli were replaced randomly from stimuli within that cell.

seconds. Each group of participants received a different random order of the infant stimuli to control for possible order effects. After all slides and rating forms were completed, participants were asked to complete the adult questionnaire. Total testing was approximately 50 minutes. Participants whose CAP inventories were invalid as a result of faking good (N = 18), faking bad (N = 1), random responses (N = 4), excessive blanks (N = 3), or who had missing infant rating data (N = 30) were replaced until a total of 250 participants was obtained.

CHAPTER IV

RESULTS

As previously stated, participants were assigned to one of two adult groups as determined by their composite scores on the Child Abuse Potential Inventory (CAP). The high scoring group (N = 58) will be referred to as High Profile Adults (HP) and the low scoring group (N = 192) will be referred to as Low Profile Adults (LP). Due to the unequal number of a adult subjects in the groups, data were analyzed utilizing least squares analyses of variance procedures.

It was anticipated that: High Profile Adults would perceive infants as less attractive and older than Low Profile Adults; preterm infants would be perceived as less attractive than full-term infants; infants with smiling faces and older infants would be rated more positively than non-smiling and younger infants; adult ratings of infant emotion would be related to adult group; and the effects of infant birth condition and of infant facial expression would be more pronounced for High Profile Adults.

Perceived Infant Attractiveness

The first analysis was performed to determine: if adult groups differed in their perceptions of infant

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attractiveness (cuteness and likeability); if these differences were more marked for the preterm infants; and if smiling infant expression and actual infant age had a positive impact on these perceptions. A 2 (Adult Group: high, low profile) x 2 (Infant Birth Condition: full-term, preterm) x 2 (Infant Expression: neutral, smiling) x 3 (Infant Age: 2 months, 4 months, 6 months (corrected for the preterm infants)) repeated measures multiple analysis of variance (MANOVA) procedure was performed on ratings of perceived infant cuteness and likeability. Based on past studies indicating that these two variables showed a linear relationship (Holmes, et al., 1987; Maier et al., 1984) and were believed to tap into the same construct, these two measures were combined. The interdependence of infant cuteness and likeability were tested and found to be significant (Bartlett Test of Sphericity (df,1) = 253.53, $\underline{p}$ < .001).

Tests of homogeneity of variance revealed lack of homogeneity of variance (Box $\underline{M}$ = 470.62, $\underline{F}$ = 1.31, $\underline{p}$ < .001) in the following variables: cuteness for the preterm infants at the two month neutral expression (PT2MNC); cuteness for the full-term infants at the two month neutral expression (FT2MNC); and likeability for the preterm infants at two and six months neutral expression (PT2MNL and PT6MNL respectively). Plots of normal probability suggested that the homogeneity of variance problems were not due to

significant deviations from normality. For each of these variables, the outliers were eliminated and data were re-analyzed and the results were consistent with those of the original MANOVA. Because the MANOVA procedures are believed to be robust enough to take care of potential problems associated with non-normal distributions for moderate sample sizes (Harris, 1985), results from the original MANOVA were assessed to be appropriate.

Results revealed that Adult Group, Infant Birth Condition, Infant Expression and Infant Age all made significant contributions to ratings of attractiveness (see Table 1). High Profile adults rated infants as less attractive than the Low Profile adults ($\underline{F}$(2, 247) = 4.27, $\underline{p}$ < .05). In addition, preterm infants were rated as less attractive than full-term infants ($\underline{F}$(2, 24) = 59.84, $\underline{p}$ < .001) and smiling infant faces were rated as more attractive than neutral infant faces ($\underline{F}$(2, 247) = 206.47, $\underline{p}$ .001). Finally, older infants were rated as more attractive than younger infants ($\underline{F}$(4, 990) = 51.48, $\underline{p}$ 51.48). However, these main effects were modified by significant interactions.

As predicted, a significant multivariate Adult Group x Infant Birth Condition x Infant Expression interaction was obtained, $\underline{F}$(2, 247) = 3.60, $\underline{p}$ < .03 (see Table 1). Univariate analyses showed infant cuteness as the major contributor to the interaction, although not significantly

Table 1

Results for Repeated Measures Multivariate Analysis of

Variance for Measures of Infant Cuteness and Likeability

Effect	F	d.f.
Main effects:		
Adult Group	4.27*	(2, 247)
Infant Birth Condition	59.84***	(2, 247)
Infant Expression	206.47***	(2, 247)
Infant Age	51.48***	(4, 990)
Interactions:		
Adult Group by:		
Infant Birth Condition	.76	(2, 247)
Infant Expression	.95	(2, 247)
Infant Age	1.37	(4, 990)
Infant Birth Condition by:		
Infant Expression	1.60	(2, 247)
Infant Age	10.04***	(4, 990)
Infant Expression by		
Infant Age	.69	(4, 990)
Adult Group by Infant Expression by:		
Infant Birth Condition	3.60*	(2, 247)
Infant Age	2.55*	(4, 990)
Infant Birth Condition by Infant Age by		
Infant Expression	3.99**	(4, 990)
Adult Group by Infant Expression by		
Infant Age by Infant Birth Condition	.45	(4, 990)

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

so; $F(1, 248) = 3.07$, $p < .09$ (see Tables 2 & 3). It was
expected that this significant three-way interaction would
be due to a significant two-way interaction between Infant
Expression and Infant Birth Condition for High Profile
Adults but not for Low Profile Adults. Specifically, it was
expected that there would be a cumulative depression in
attractiveness ratings for preterm infant with neutral
expression for High Profile Adults. While visual inspection
of Figure 1 supported this prediction, neither univariate
two-way interactions involving Infant Expression and Infant
Birth Condition were significant for either Adult Group. As
shown in Tables 4 and 5, simple effects analyses revealed
significant effects which indicated that, overall, Low
Profile Adults rated infants as cuter than High Profile
Adults (overall mean rating for the Low Profile Adults =
4.84; mean overall rating for the High Profile Adults =
4.47). Moreover, there was a nonsignificant trend for the
Low Profile Adults to rate the full-term infants as cuter
than the pre-term infants (mean overall rating for the full-
term infants = 4.97, mean overall rating for the preterm
infants = 4.71; $F(1, 195) = 2.98$, $p < .10$). This trend was
not found for the High Profile Adults (mean overall rating
for the full-term infants = 4.60, mean overall rating for
the preterm infants = 4.33; $F(1, 195) = .97$, n.s.). Both
Adult Groups rated infants with smiling faces as
significantly cuter than the same infant with neutral

Table 2

Results for Repeated Measures Univariate Analysis of
Variance: The Effects of Adult Group (AG), Infant Birth
Condition (IBC), Infant Expression (IE), and Infant Age (IA)
on Measures of Infant Cuteness

Effect	SS	df	MS	F	P
AG	2175.81	(1, 248)	8.77	8.54	< .01
IA	245.15	(2, 496)	.49	101.48	< .001
IA x AG	245.15	(2, 496)	.49	1.21	n.s.
IBC	116.42	(1, 248)	.47	116.62	< .001
IBC x AG	116.42	(1, 248)	.47	.03	n.s.
IE	220.82	(1, 248)	.89	218.08	< .001
IE x AG	220.82	(1, 248)	.89	.47	n.s.
IA x IBC	187.84	(2, 496)	.38	14.51	< .001
IA x IBC x AG	187.84	(2, 496)	.38	.18	n.s.
IA x IE	176.29	(2, 496)	.36	.80	n.s.
IA x IE x AG	176.29	(2, 496)	.36	2.89	< .06
IBC x IE	61.35	(1, 248)	.25	2.94	< .10
IBC x IE x AG	61.35	(1, 248)	.25	3.07	< .09
IA x IBC x IE	181.06	(2, 496)	.37	5.80	< .01
IA x IBC x IE x AG	181.06	(2, 496)	.37	.53	n.s.

Table 3

Means (and Standard Deviations) of Cuteness Ratings for

Adult Group, Infant Birth Condition, Infant Expression, and

Infant Age

	Conditions	
	Low Profile Adults	High Profile Adults

Preterm

2 Months
No Smile	4.18 (1.23)	3.70 (0.86)
Smile	4.62 (1.18)	4.27 (1.06)

4 Months
No Smile	4.50 (1.05)	4.06 (1.01)
Smile	5.09 (1.07)	4.68 (1.05)

6 Months
No Smile	4.67 (1.09)	4.25 (1.05)
Smile	5.18 (1.05)	5.00 (1.10)

Full-Term

2 Months
No Smile	4.55 (1.12)	4.09 (0.89)
Smile	5.13 (1.09)	4.75 (1.08)

4 Months
No Smile	4.77 (1.00)	4.49 (1.12)
Smile	5.14 (1.07)	4.64 (0.99)

6 Months
No Smile	4.92 (1.06)	4.56 (0.91)
Smile	5.38 (0.95)	5.12 (0.82)

Note: Higher ratings correspond to more positive
evaluations

Figure 1. Differences in adult ratings of infant cuteness as a function of adult group, infant birth condition, and infant expression.

Note. Higher ratings correspond to more positive evaluations.
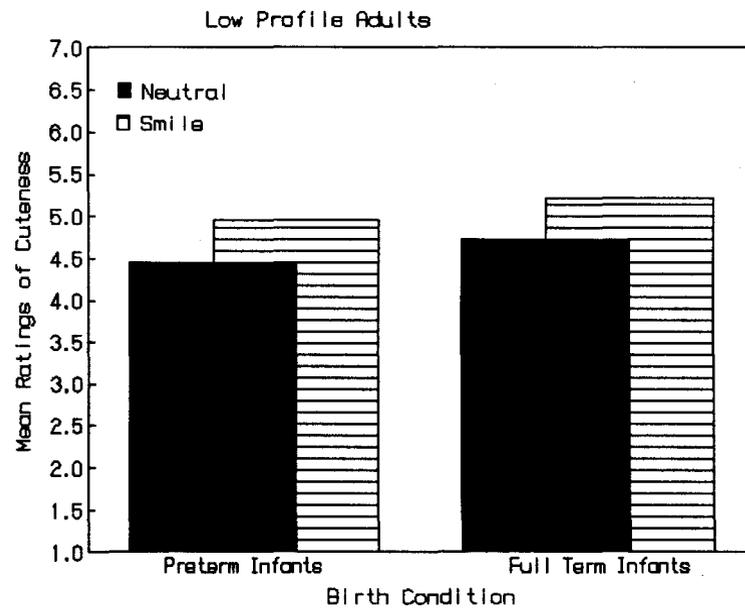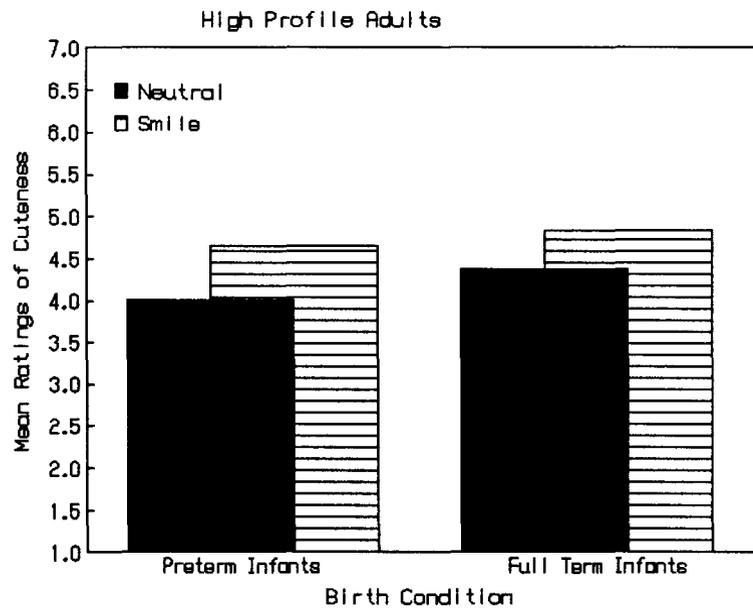
Table 4

Results for Repeated Measures Univariate Simple Effects

Analyses of Variance: The Effects of Infant Birth

Condition (IBC) and Infant Expression (IE) on Measures

of Infant Cuteness for Low Profile Adults

Effect	SS	df	MS	F	P
IBC	13.79	1	13.79	2.98	< .10
Error		195	4.62		
IE	47.21	1	47.21	69.53	< .01
IBC x IE	.04	1	.04	.06	n.s.
Error		321	.68		

Table 5

Results for Repeated Measures Univariate Simple Effects

Analyses of Variance: The Effects of Infant Birth Condition

(IBC) and Infant Expression (IE) on Measures of Infant

Cuteness for High Profile Adults

Effect	SS	df	MS	F	P
IBC	4.46	1	4.46	.97	n.s.
Error		195	4.62		
IE	17.66	1	17.66	26.01	< .01
IBC x IE	.46	1	.46	.68	n.s.
Error		321	.68		

expressions (for the Low Profile Adults, mean overall rating for smiling infant expression = 5.09, mean overall rating for the neutral infant expression = 4.59, $F(1, 321)$ = 69.53, p , < .01; for the High Profile Adults, mean overall rating for the smiling infant expression = 4.74, mean overall rating for the neutral infant expression = 4.19, $F(1, 321)$ = 26.01, p < .01).

In summary, these results indicated that, overall, high profile adults perceived infants as less cute than did low profile adults, regardless of infant facial expression and infant birth condition. Infant facial expression influenced ratings of infant cuteness for both adult groups such that infants were rated as cuter when they were smiling. In addition, the low profile adults (but not the high profile adults) tended to rate full-term infants as cuter than the preterm infants. Moreover, while neither univariate two-way interactions between Infant Birth Condition and Infant Expression were significant for either Adult Group, visual inspection of Figure 1 suggested that the significant multivariate three-way interaction reflects a tendency for the high profile adults to rate preterm infants with neutral faces in a less positive manner than the low profile adults.

In addition to the significant interaction between Adult Group, Infant Birth Condition, and Infant Expression just discussed, a significant multivariate interaction involving Adult Group, Infant Expression, and Infant Age was

also obtained, $\underline{F}$(4, 992) = 2.55, $\underline{p}$ < .04 (see Table 1).
Again, infant cuteness was found to be the main contributor
to the interaction, although not significantly so; $\underline{F}$(2, 496)
= 2.89, $\underline{p}$ < .06 (see Tables 2 & 3). Visual inspection of
Figure 2, showed a pattern similar to the previous three-way
interaction. Again, while neither univariate two-way
interactions between Infant Expression and Infant Age were
significant, Figure 2 suggested that the significant
multivariate three-way interaction reflects a cumulative
negative impact of being two-months old with a neutral face
and being observed by a High Profile Adult. As shown on
Tables 6 and 7, analyses of simple effects revealed that Low
Profile Adults rated infants, in general, as significantly
cuter than did the High Profile Adults (mean overall rating
for the Low Profile Adults = 4.84; mean rating for High
Profile Adults = 4.46). Both Adult Groups rated infants
with smiling expressions as cuter than the same infants with
neutral expressions (for the Low Profile Adults, mean rating
for smiling infant faces = 5.09, mean rating for the infant
neutral expression = 4.59, $\underline{F}$(1, 212) = 14.66, $\underline{p}$, < .01; for
the High Profile Adults, mean rating for the smiling infant
expression = 4.74, mean rating for the neutral infant
expression = 4.19 $\underline{F}$(1, 212) = 54.82, $\underline{p}$ < .01). In addition,
as infant age increased, ratings of cuteness increased for
both adult groups (for the Low Profile Adults mean ratings
at 2 months = 4.62, at 4 months = 4.86, at 6 months = 5.04

Figure 2. Differences in adult ratings of infant cuteness as a function of adult group, infant age, and infant expression.

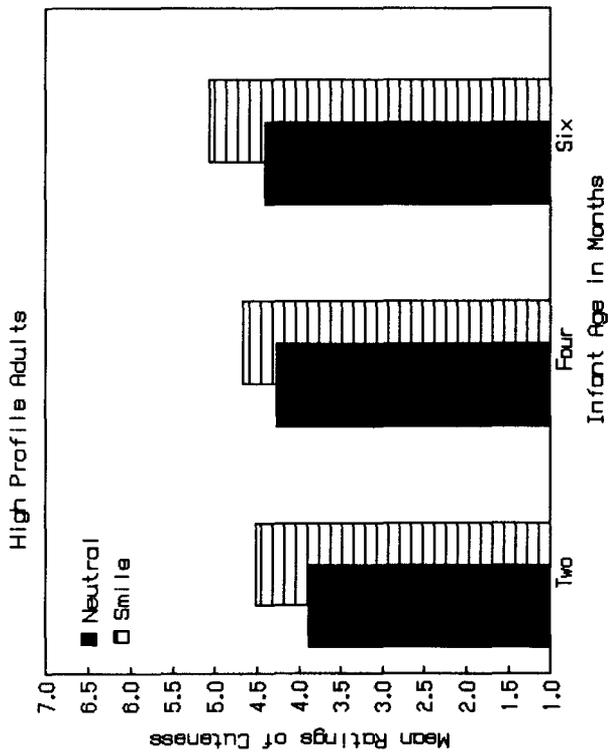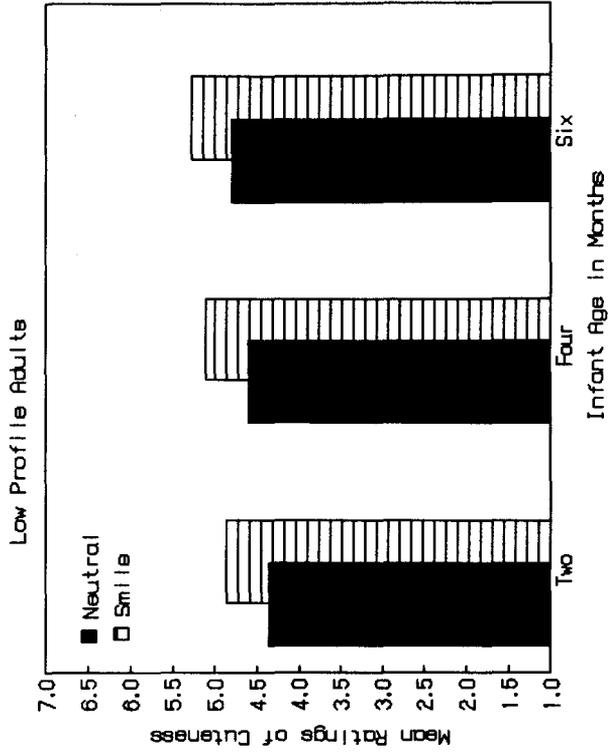Note. Higher ratings correspond to more positive evaluations.

Table 6

Results for Repeated Measures Univariate Simple Effects
Analyses of Variance: The Effects of Infant Expression (IE)
and Infant Age (IA) on Measures of Infant Cuteness for Low
Profile Adults

Effect	SS	df	MS	F	P
IE	70.82	1	70.82	14.66	< .01
Error		212	.48		
IA	34.45	2	17.23	34.86	< .01
IE x IA	.05	2	.03	.06	n.s.
Error		352	.49		

Table 7

Results for Repeated Measures Univariate Simple Effects
Analyses of Variance: The Effects of Infant Expression (IE)
and Infant Age (IA) on Measures of Infant Cuteness for High
Profile Adults

Effect	SS	df	MS	F	P
IE	26.48	1	26.48	54.82	< .01
Error		212	.48		
IA	16.30	2	8.15	16.63	< .01
IE x IA	1.26	2	.63	1.28	n.s.
Error		352	.49		

$F(2, 352) = 34.86$, p , $< .01$; for the High Profile Adults mean ratings at 2 months = 4.20, at 4 months = 4.47, at 6 months = 4.73, $F(2, 352) = 16.63$, p , $< .01$). Post hoc Scheffé analyses performed to assess the significance of pairwise differences between ages revealed that although the average cuteness ratings increased with age, the magnitude of the differences was different depending on the Adult Group. For the Low Profile Adults, significance was found between the 2 month and 4 month ratings (difference between means = .24; $F(2, 352) = 11.29$, p, $< .05$), whereas no significance was found between the 4 and 6 month ratings (difference between means = .18; $F(2, 352) = 6.35$, n.s.). However, for the High Profile Adults, significance was found between the 2 and 6 months ratings (difference between means = .53; $F(2, 352) = 16.53$, $p < .01$) but not between the 2 and 4 months ratings (difference between means = .27; $F(2, 353) = 4.29$, n.s.) nor the 4 and 6 months ratings (difference between means = .26; $F(2, 353) = 3.98$, n.s.

Finally, a significant multivariate interaction involving Infant Birth Condition, Infant Age, and Infant Expression was obtained; $F(4, 992) = 3.98$, $p < .004$). Univariate analyses revealed that ratings of cuteness ($F(2, 496) = 5.80$, $p < .004$) and likeability ($F(2, 496) = 6.41$, $p < .003$) contributed to the interaction (for cute, see Tables 2 & 3; for likeable, see Tables 8 & 9). As shown in Figure 3, smiling infant expressions were rated as cuter than

Table 8

Results for Repeated Measures Univariate Analysis of

Variance: The Effects of Adult Group (AG), Infant Birth

Condition (IBC), Infant Expression (IE), and Infant Age (IA)

on Measures of Infant Likeability

Effects	SS	df	MS	F	P
AG	1965.71	(1, 248)	7.93	6.03	< .05
IA	190.66	(2, 496)	.38	88.54	< .001
IA x AG	190.66	(2, 496)	.38	2.35	< .10
IBC	77.20	(1, 248)	.31	68.67	< .001
IBC x AG	77.20	(1, 248)	.31	1.09	n.s.
IE	248.88	(1, 248)	1.00	401.36	< .001
IE x AG	248.88	(1, 248)	1.00	1.88	n.s.
IA x IBC	126.15	(2, 496)	.25	17.07	< .001
IA x IBC x AG	126.15	(2, 496)	.25	.57	n.s.
IA x IE	134.55	(2, 496)	.27	.96	n.s.
IA x IE x AG	134.55	(2, 496)	.27	.67	n.s.
IBC x IE	58.31	(1, 248)	.23	2.02	n.s.
IBC x IE x AG	58.31	(1, 248)	.23	.39	n.s.
IA x IBC x IE	128.40	(2, 496)	.26	6.41	< .01
IA x IBC x IE x AG	128.40	(2, 496)	.26	.03	n.s.

Table 9

Means (and Standard Deviations) of Likeability Ratings for

Adult Group, Infant Birth Condition, Infant Expression, and

Infant Age

	Conditions	
	Low Profile Adults	High Profile Adults

Preterm

  2 Months
No Smile	4.53 (1.15)	4.09 (0.87)
Smile	5.19 (1.05)	4.79 (1.05)

  4 Months
No Smile	4.81 (1.01)	4.43 (0.94)
Smile	5.58 (0.96)	5.29 (1.02)

  6 Months
No Smile	4.90 (1.09)	4.60 (0.87)
Smile	5.68 (0.91)	5.53 (0.97)

Full-Term

  2 Months
No Smile	4.76 (1.09)	4.40 (0.91)
Smile	5.55 (0.97)	5.26 (0.96)

  4 Months
No Smile	4.98 (1.02)	4.65 (0.92)
Smile	5.56 (0.96)	5.37 (0.89)

  6 Months
No Smile	5.06 (0.97)	4.71 (0.91)
Smile	5.71 (0.90)	5.59 (0.78)

Note: Higher ratings correspond to more positive evaluations

Figure 3. Differences in adult ratings of infant cuteness as a function of infant birth condition, infant age, and infant expression.

Note. Higher ratings correspond to more positive evaluations.

Smile Expression — Mean Ratings of Cuteness vs Age in Months (Preterm, Full term)

Neutral Expression — Mean Ratings of Cuteness vs Infant Age in Months (Preterm, Full term)
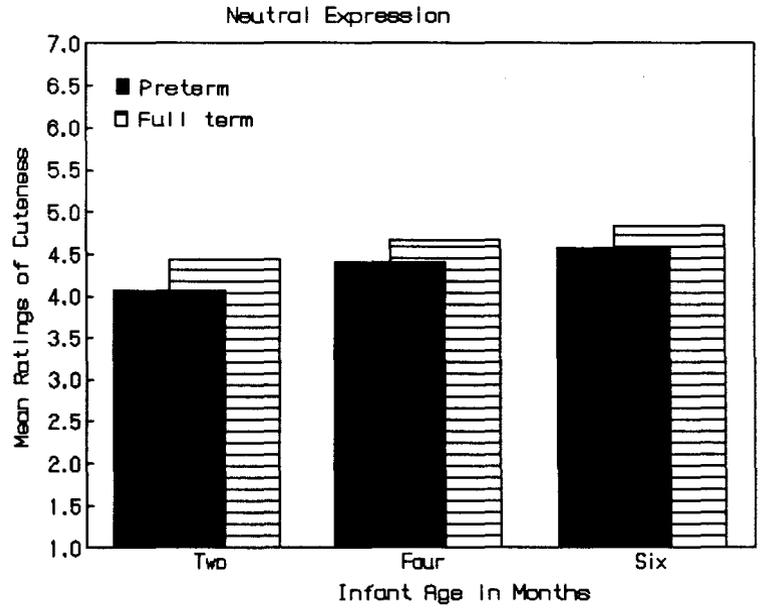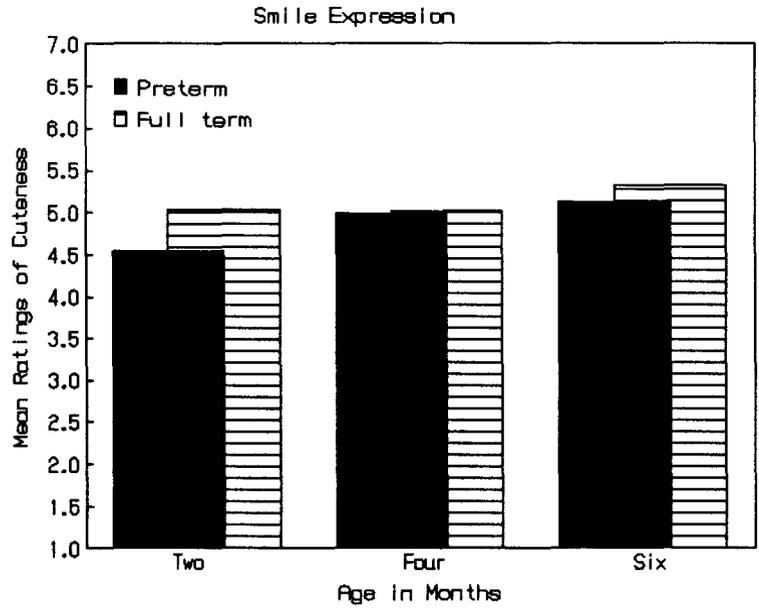
neutral infant expressions (mean overall rating for the smiling expression = 5.01, mean overall rating for the neutral expression = 4.50). Simple effects analyses revealed that in the neutral facial expression, overall, full-term infants were rated as cuter than preterm infants with the same expression (mean overall rating for full-term infants = 4.65, mean overall rating for pre-term infants = 4.36; $F(1, 321) = 50.07$, $p < .01$). Also, as infant age increased, ratings of cuteness increased (mean rating for 2 months = 4.22, for 4 months = 4.53, for 6 months = 4.71; $F(2, 687) = 61.28$, $p < .01$). Post hoc Scheffé analyses revealed significance at the 2 and 4 months ratings (difference between means = .31; $F(2, 687) = 38.75$, $p < .01$) and ratings between 4 and 6 months (difference between means = .18, $F(2, 687) = 13.06$, $p < .05$). However, in the smiling expression condition, these effects were modified by a significant Infant Birth Condition x Infant Age interaction, $F(2, 687) = 16.60$, $p < .01$. Second order effects analyses revealed that full-term infants were rated as significantly cuter than preterm infants at the 2 and 6 month ages (for 2 months: mean rating for the full-term infants = 5.04, mean rating for the preterm infants = 4.56; $F(1, 838) = 43.58$, $p < .01$; for 6 months: mean rating for the full-term infants = 5.32, mean rating for preterm infants = 5.13; $F(1, 838) = 5.82$, $p < .01$). This difference was not found at the 4 month age (mean rating for full-term infants = 5.02, mean

rating for preterm infants = 4.99; $F(1, 838) = .19$, n.s.).

As shown in Figure 4, a similar pattern was found on ratings of likeability, infants with smiling expressions were rated as more likeable than the same infants with neutral expressions (mean overall rating for smiling expression = 5.50, mean overall rating for smiling expression = 4.76). In the neutral infant expression, full-term infants were rated as more likeable than the preterm infants, $F, (1, 286) = 21.38$, $p < .01$ (mean rating for the full-term infants = 4.85, mean rating for the preterm infants = 4.66). Also, ratings of likeability increased with infant age; $F(2, 209) = 50.82$, $p < .01$ (mean rating at 2 months = 4.55, at 4 months = 4.82, at 6 months = 4.91). Post hoc Scheffé analyses revealed a significant difference between the 2 and 4 month ages (difference between means = .27, $F(2, 409) = 27.61$, $p < .01$) but not between the 4 and 6 month ages (difference between means = .09, $F(2, 409) = 3.07$, n.s. A significant Infant Birth Condition x Infant Age was also found in the smiling expression condition; $F(2, 409) = 17.03$, $p < .01$. Second order effect analyses revealed that full-term infants were rated as significantly more likeable than preterm infants at the 2 month age (mean rating for full-term infants = 5.49, mean rating for preterm infants = 5.10, $F(1, 709) = 30.55$, $p < .01$). This difference was not found at the 4 month age (mean rating for full-term infants = 4.91, mean rating for pre-term infants =

Figure 4. Differences in adult ratings of infant likeability as a function of infant birth condition, infant age, and infant expression.

Note. Higher ratings correspond to more positive evaluations.

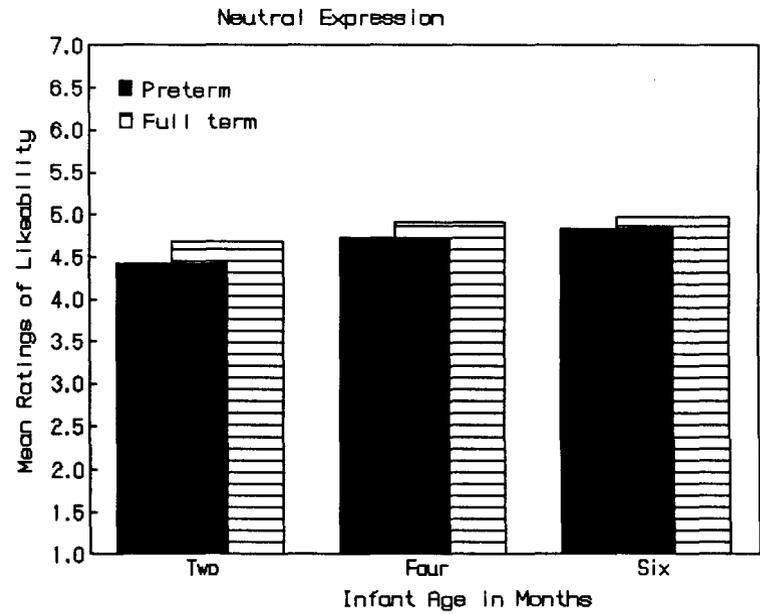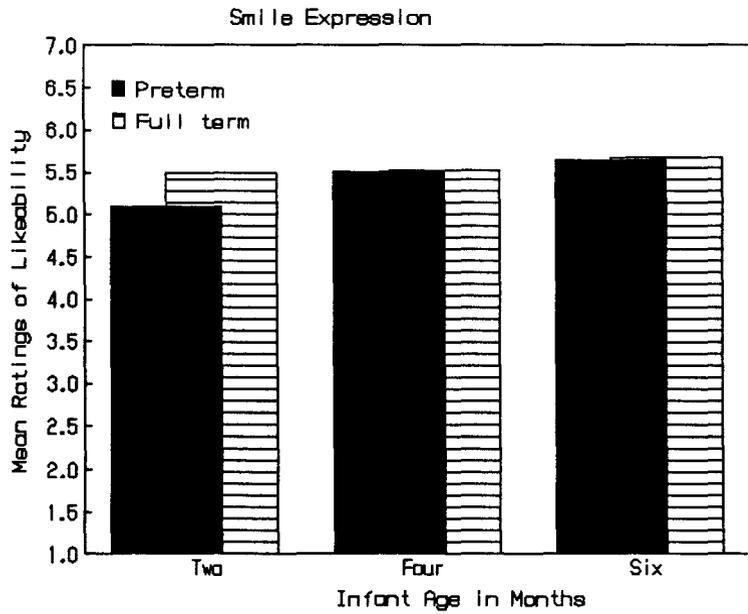**Smile Expression**

Mean Ratings of Likeability vs. Infant Age in Months

- Preterm
- Full term

Neutral Expression

Mean Ratings of Likeability vs. Infant Age in Months

- Preterm
- Full term

4.73, $\underline{F}$(1, 709) = .02, n.s.) nor the 6 month age (mean rating for the full-term infants = 4.97, mean rating for the preterm infants = 4.83, $\underline{F}$(1, 709) = .26, n.s.).

In summary, these analyses indicated infants with smiling facial expressions were perceived as cuter than infants with neutral expressions. Moreover, in the neutral facial expression, full-term infants were perceived as cuter and more likeable than preterm infants. In the smiling infant condition, full-term infants were perceived as cuter than preterm infants when they were two and six months but not at four months. Finally, full-term infants were perceived as more likeable than preterm infants at the 2 month age but not the four and six month ages.

Overall, these results indicated that low profile adults perceived infants as cuter than did high profile adults. For both adult groups, smiling infant facial expression and infant age had a positive impact on perceptions of infant cuteness. The low profile adults, but not the high profile adults, had the tendency to perceive full-term infants as cuter than preterm infants. Moreover, visual inspection of the univariate three-way interactions involving Adult Group, Infant Birth Condition, Infant Expression, and Infant Age (Figures 2 & 3) support the speculation of a cumulative effect on ratings of infant cuteness. Specifically, Figures 2 & 3 suggested that high profile adults tended to rate the neutral face of two-month

old infants and preterm infants in a less positive manner
than the low profile adults. Results also indicated that,
in general, full-term infants were perceived as cuter and
more likeable than preterm infants when the infants
exhibited neutral expressions. In addition, although
ratings of cuteness and likeability increased with age, the
size of the effect of age on these dependent variables
decreased as infant age increased.

<u>Perceived Infant Age</u>

The next set of analysis were performed to determine if
adult groups differed in their perceptions of infant age; if
these differences were more marked for the preterm infants;
and if smiling infant facial expression influenced ratings
of perceived age. A 2 (Adult Group: high, low profile) x 2
(Infant Birth Condition: full-term, preterm) x 2 (Infant
Expression: smiling, neutral) x 3 (Infant Age: 2 months, 4
months, 6 months (corrected for preterm infants)) repeated
measures ANOVA was performed to assess perceptions of infant
age (see Tables 10 & 11).

A significant Adult Group x Infant Birth Condition x
Infant Age interaction was obtained; $F(2, 496) = 3.17$, $p <$
.05. As shown in Figure 5, overall, High Profile Adults
rated infants as older than Low Profile Adults (overall mean
rating of High Profile Group = 4.01; overall mean rating for
Low Profile Group = 3.68. Simple effects analyses revealed
a significant Infant Birth Condition x Infant Age for the

Table 10

Results for Repeated Measures Analysis of Variance: The

Effects of Adult Group (AG), Infant Birth Condition (IBC),

Infant Expression (IE), and Infant Age (IA) on Measures of

Perceived Infant Age

Effects	SS	df	MS	F	P
AG	41.04	1	41.04	3.95	< .05
Error	2575.65	248	10.39		
IA	375.55	2	187.77	436.31	< .001
IA x AG	3.26	2	1.63	3.79	< .05
Error	213.46	496	.43		
IBC	46.75	1	46.75	107.39	< .001
IBC x AG	.55	1	.51	1.26	n.s.
Error	107.96	248	.44		
IE	13.00	1	13.00	36.87	< .001
IE x AG	1.45	1	1.45	4.08	< .05
Error	87.94	248	.35		
IA x IBC	10.90	2	5.45	19.00	< .001
IA x IBC x A	1.82	2	.91	3.17	< .05
Error	142.18	496	.29		
IA x IE	1.01	2	.51	194	n.s.
IA x IE x AG	.05	2	.03	.10	n.s.
Error	129.52	496	.26		
IBC x IE	1.03	1	1.03	3.70	n.s.
IBC x IE x A	.05	1	.05	.19	n.s.
Error	68.91	248	.28		
IA x IBC x IE	.10	2	.05	.18	n.s.
IA x IBC x IE x AG	.05	2	.02	.09	n.s.
Error	132.27	496	.27		

Table 11

Means (and Standard Deviations) of Age Ratings for Adult

Group, Infant Birth Condition, Infant Expression, and Infant

Age

	Conditions	
	Low Profile Adults	High Profile Adults

Preterm

2 Months
No Smile	3.16 (0.99)	3.50 (1.02)
Smile	3.34 (1.08)	3.54 (1.03)

4 Months
No Smile	3.68 (1.01)	3.97 (1.19)
Smile	3.85 (1.08)	4.01 (1.09)

6 Months
No Smile	3.97 (1.12)	4.27 (1.25)
Smile	4.21 (1.12)	4.40 (1.08)

Full-Term

2 Months
No Smile	3.31 (1.01)	3.83 (1.13)
Smile	3.42 (1.06)	3.89 (1.04)

4 Months
No Smile	4.17 (1.17)	4.40 (1.14)
Smile	4.24 (1.08)	4.34 (0.99)

6 Months
No Smile	4.16 (1.07)	4.47 (1.11)
Smile	4.32 (1.07)	4.56 (1.01)

Note: Higher ratings correspond to "older" evaluations

Figure 5. Differences in adult ratings of infant age as a function of adult group, infant birth condition, and infant age.

Note. Higher ratings correspond to "older" evaluations.

High Profile Adults

Mean Ratings of Age

- ■ Preterm
- □ Full term

Infant Age In Months

Low Profile Adults

Mean Ratings of Age

- ■ Preterm
- □ Full term

Infant Age In Months
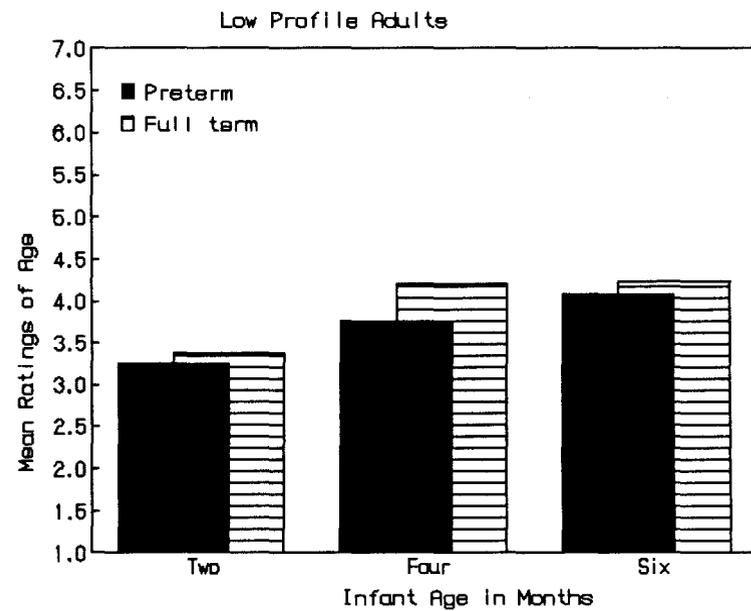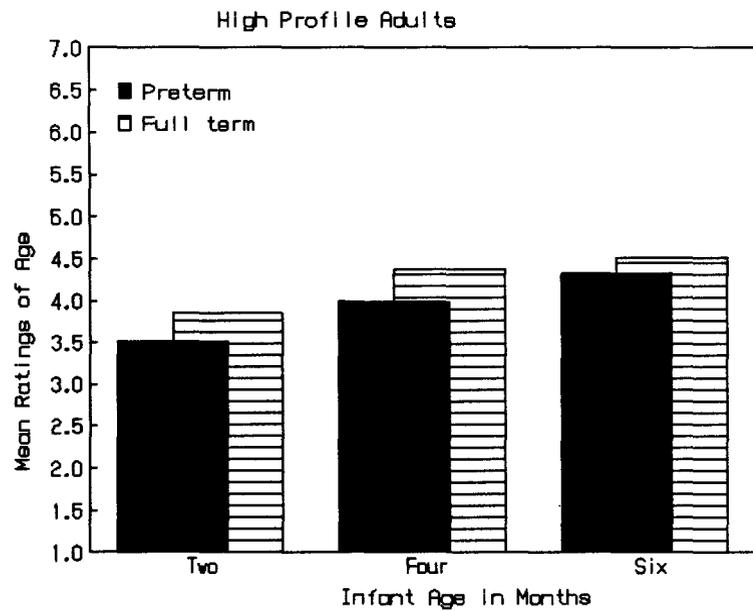
Low Profile Adults (F(2, 679) = 7.94 p < .01) but not for the High Profile Adults (F(2, 679) = .89, n.s.). Second order effect analyses showed that the Low Profile Adults had the tendency to rate full-term infants as older than the preterm infants, with this difference more marked when the infants were four months old (overall mean rating for the full-term infants at 2 months = 3.37, at 4 months = 4.20, at 6 months = 4.24; mean overall ratings for preterm infants at 2 months = 3.25, at 4 months = 3.77, at 6 months = 4.09). Neither the effect of Infant Birth Condition nor the Infant Birth Condition x Infant Age interaction were found for the High Profile Adults. However, in the High Profile Adult Group, ratings of perceived infant age increased with actual infant age; F(2, 679) = 16.12, p < .01. Post hoc Scheffé analyses were performed to assess the significance of pairwise differences between ages. These analyses revealed that two month mean rating was significantly less than the four month mean rating, F(1, 679) = 24.34, p < .01, but the difference between the four and six month mean ratings failed to achieve significance.

In addition to the Adult Group x Infant Birth Condition x Infant Age, a significant Adult Group x Infant Expression was obtained, F(2, 496) = 3.79, p < .03 (see Figure 6). Analyses of simple effects indicated that the Low Profile Adults rated infants with smiling facial expressions as older the infants with neutral expressions, F(1, 352) =

<u>Figure 6</u>. Differences in adult ratings of infant age as a function of adult group and infant expression.

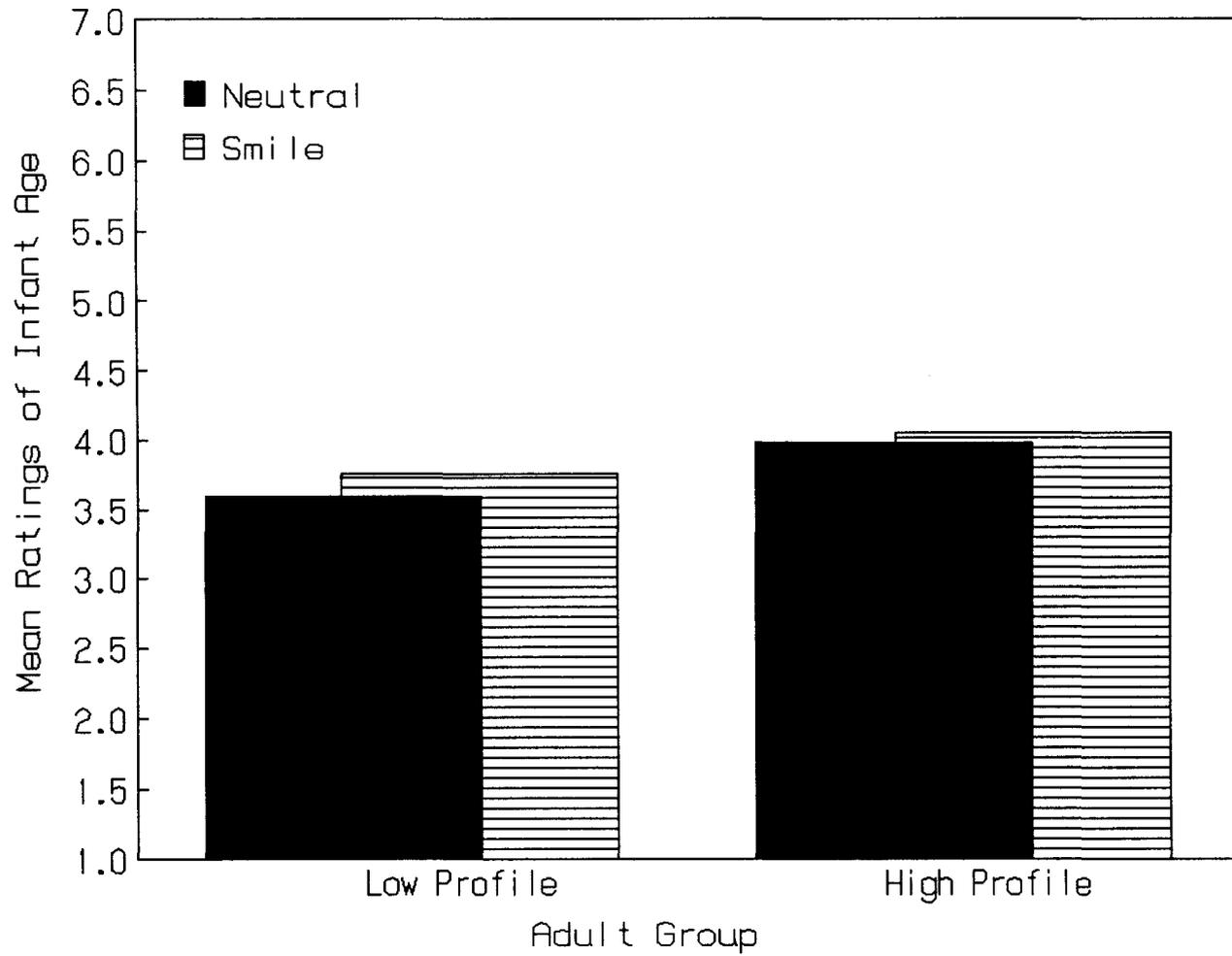<u>Note</u>. Higher ratings correspond to "older" evaluations.

5.08, p < .05.   This impact of infant facial expression was not found for the High Profile Adults.

In summary, these results indicated that, overall, high profile adults perceived infants as older than did low profile adults. In addition, the High Profile Adults did not differentiate between infant birth condition on their perceptions of infant age whereas the Low Profile Adults perceived full-term infants as older than preterm infants, with this difference more marked when the infants were four months old. Although ratings of infant age increased with actual infant age, the magnitude of the differences decreased as age increased. Finally, Low Profile Adults perceived faces of smiling infants as older than the same infants with neutral facial expression. This impact of infant facial expression was not found for the High Profile Adults.

Perceived Emotion

Finally, an Adult Group x Infant Birth Condition x Infant Expression x Infant Age repeated measures ANOVA was performed on ratings of infant emotional state (see Tables 12 & 13). Results revealed a significant main effect of Adult Group (F(1, 248) = 4.26, p < .05) which indicated that the Low Profile Adults rated infants as significantly happier than the High Profile Adults (mean rating for the low risk adults = 4.88, mean rating for the high profile adults = 4.24). A significant interaction involving Infant

Table 12

Results for Repeated Measures Analysis of Variance: The
Effects of Adult Group (AG), Infant Birth Condition (IBC),
Infant Expression (IE), and Infant Age (IA) on Measures of
Perceived Infant Emotion

Effects	SS	df	MS	F	P
AG	10.13	1	10.13	4.26	< .05
Error	589.65	248	2.38		
IA	162.00	2	81.00	231.55	< .001
IA x AG	1.70	2	.85	2.43	n.s.
Error	173.51	496	.35		
IBC	14.49	1	14.49	53.71	< .001
IBC x AG	.02	1	.02	.06	n.s.
Error	66.91	248	.27		
IE	3332.75	1	3332.75	3635.75	< .001
IE x AG	.00	1	.00	.00	n.s.
Error	227.34	248	.92		
IA x IBC	2.58	2	1.29	4.32	< .05
IA x IBC x AG	.44	2	.22	.74	n.s.
Error	148.00	496	.30		
IA x IE	2.34	2	1.17	3.85	< .05
IA x IE x AG	.22	2	.11	.37	n.s.
Error	150.61	496	.30		
IBC x IE	1.03	1	1.03	3.70	n.s.
IBC x IE x AG	.05	1	.05	.19	n.s.
Error	68.91	248	.28		
IA x IBC x IE	5.89	2	2.94	8.56	< .001
IA x IBC x IE x AG	.83	2	.41	1.20	n.s.
Error	170.68	496	.34		

Table 13

Means (and Standard Deviations) of Infant Emotional State

Ratings for Adult Group, Infant Birth Condition, Infant

Expression, and Infant Age

	Conditions	
	Low Profile Adults	High Profile Adults

Preterm

2 Months
No Smile	3.47 (0.68)	3.28 (0.66)
Smile	5.42 (0.80)	5.29 (0.82)

4 Months
No Smile	3.89 (0.74)	3.75 (0.79)
Smile	6.09 (0.64)	5.90 (0.71)

6 Months
No Smile	3.88 (0.70)	3.69 (0.69)
Smile	6.12 (0.73)	6.11 (0.75)

Full-Term

2 Months
No Smile	3.58 (0.73)	3.50 (0.65)
Smile	5.76 (0.81)	5.53 (0.73)

4 Months
No Smile	4.13 (0.82)	3.89 (0.75)
Smile	6.10 (0.72)	5.90 (0.72)

6 Months
No Smile	4.01 (0.65)	4.03 (0.67)
Smile	6.12 (0.73)	6.07 (0.77)

Note: Higher ratings correspond to more positive
evaluations

Birth Condition, Infant Expression and Infant Age was also obtained, $\underline{F}$(2, 496) = 8.65, $\underline{p}$ < .001. As shown in Figure 7, infants with smiling faces were rated as happier than when they exhibited neutral facial expressions (mean rating for smiling expression = 5.90, mean rating for neutral expression = 3.80). In the neutral expression condition, full-term infants were rated as happier than preterm infants (mean rating for full-term infants = 3.88, mean rating for preterm infants = 3.71; $\underline{F}$(1, 272) = 18.95, $\underline{p}$ < .01). In addition, older infants were rated as happier than younger infants, $\underline{F}$(2, 351) = 104.06, $\underline{p}$ < .01. Post hoc Scheffé analyses were performed to assess the significance of pairwise differences between ratings. These analyses revealed that the two month mean rating was significantly less than the four month rating, $\underline{F}$(1, 351) = 84.71, $\underline{p}$ < .01. The difference between the four and six month mean ratings failed to achieve significance. In the smiling expression condition, a significant Infant Risk x Infant age interaction was obtained, $\underline{F}$(2, 351) = 4.01, $\underline{p}$ < .01. Second order effects analyses revealed that full-term infants were rated as happier than preterm infants when the infants were two months old (mean rating for full-term infants = 5.71, mean rating for preterm infants = 5.39, $\underline{F}$(1, 736) = 20.63, $\underline{p}$ < .01) but not at the four and six month ages (mean rating for full-term infants at 4 months = 6.06, at 6 months = 6.11; mean rating for preterm infants at 2 months = 6.05, at

<u>Figure 7</u>. Differences in adult ratings of infant emotion as
a function of infant expression, infant age, and infant
birth condition.

<u>Note</u>. Higher evaluations correspond to more positive
evaluations.

Smile Expression

Mean Ratings of Infant Emotion vs. Infant Age in Months

- Preterm
- Full term

Neutral Expression

Mean Ratings of Infant Emotion vs. Infant Age in Months
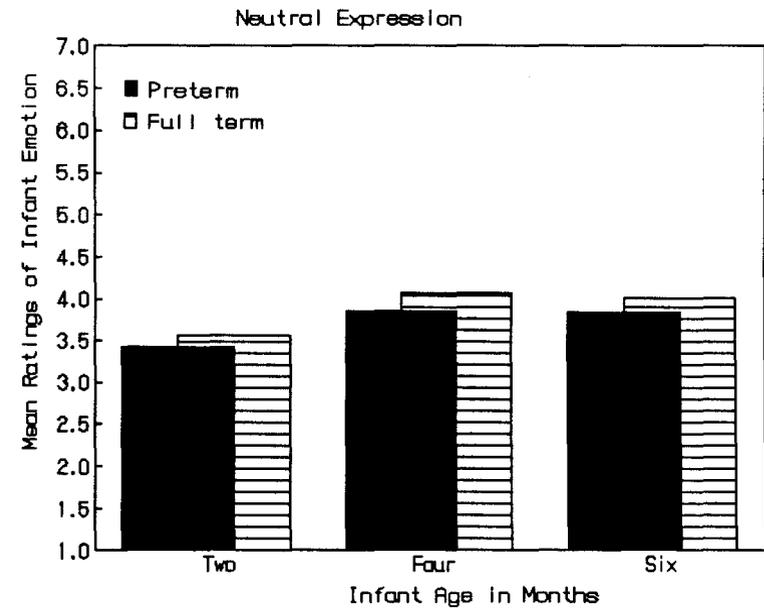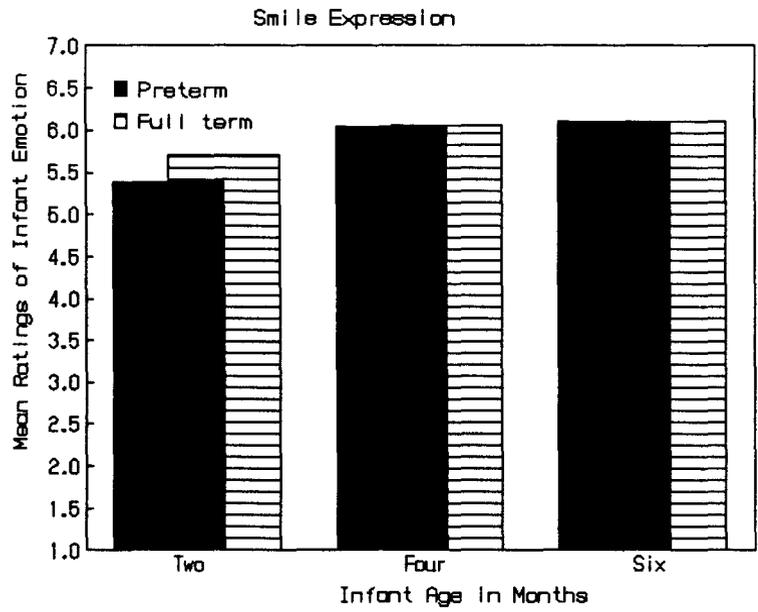
- Preterm
- Full term

6 months = 6.11).

In summary, these analyses indicated that older infants were perceived as happier than younger infants. In addition, full-term infants with neutral facial expression were perceived as happier than the preterm infants with the same expressions, and smiling full-term infants were perceived as happier than smiling preterm infants when the infants were two months but not at any other age. Perceptions of infant happiness increased with infant age. Moreover, low profile adults perceived infants, in general, as happier than high profile adults.

CHAPTER V

DISCUSSION

The purpose of this study was to examine adult
perceptions of infants as a function of adult
characteristics and of infant characteristics. Based on the
marriage of two areas of research (i.e., expectations of
dysfunctional parents and infant attractiveness), it was
expected that adults with characteristics found in
dysfunctional parents would view infants as less attractive
and older than adults without these characteristics, and
that these differences would be more marked for preterm
infants. It was also anticipated that smiling infant faces
would have a positive impact on adult perceptions of infant
attractiveness but that this effect would be less pronounced
for high profile adults. This study was also designed to
determine if these effects would vary with the age of the
children.

As expected, on the basis of previous research which
has suggested a "hypersensitivity" in inadequate parents,
non-parenting adults in this study with characteristics
associated with dysfunctional parenting (i.e., high profile
group), in general, perceived infants as less attractive

(cute) than non-parenting adults without these characteristics (i.e., low profile group).

In addition to the expectations that adult groups would differ in their perceptions of infant attractiveness, it was also anticipated that perceptions of infant attractiveness would be modified by characteristics of the infants. It was anticipated, based on past studies, that preterm infants would be perceived as less attractive than full-term infants and that this negative evaluation would be more marked for the high profile adults. Evidence for this prediction was attained in the findings of a significant multivariate interaction among Adult Group, Infant Birth Condition, and Infant Expression. While neither of the univariate simple effects two-way interactions between Infant Birth Condition and Infant Expression were statistically significant, visual inspection of the cuteness means (see Figure 1) supports the interpretation that this three-way interaction reflects a tendency for high profile adults to view preterm infants with neutral faces in a particularly negative manner, as predicted.

Findings also showed that less subtle features, such as infant expression and age, may have a positive impact on adult evaluations. As predicted, the data indicated that for both adult groups, infants with smiling expressions elicited more positive ratings of attractiveness than neutral infant faces and older infants were perceived as

more attractive than younger infants.

Although, overall, older infants received higher ratings of attractiveness than younger infants, the magnitude of the difference was dependent on adult group. The data suggested that within the high profile adult group, the advantage of infant age did not make a significant contribution in attractiveness ratings until the infants were six months old, whereas in the low profile adult group, the difference appeared between the two and four month ages. This suggests that any overall advantage of smiling to elicit more positive evaluations by high profile adults may not occur until infants are more than four months old. Moreover, while neither of the univariate simple effects two-way interactions between Infant Expression and Infant Age were statistically significant, visual inspection of the cuteness mean ratings (see Figure 2) support the interpretation that the significant three-way multivariate Adult Group, Infant Expression, and Infant Age interaction reflects the tendency for high profile adults to perceive two months old infants with neutral faces less positively.

In addition to the expectations that adult and infant characteristics would influence perceptions of infant attractiveness, it was also anticipated that these variables would contribute to perceptions of infant age. Data revealed that adults in the high profile group perceived infants, in general, as older than did adults in the low

profile group regardless of infant birth condition, facial
expression and actual age. Moreover, the low profile
adults, but not the high profile adults, rated the full-term
infants as older than the preterm infants, with this
difference more marked when the infants were four months old
than at two or six months of age. The data suggested that
unlike the low profile adults, the high profile adults do
not differentiate between the faces of preterm and full-term
infants in terms of age. This lower perception of age of
preterm infants by low profile adults suggests that these
adults may therefore lower their expectations of the
competencies of preterm infants. On the other hand, high
profile adults, who appear to overestimate infant age in
general may expect infants to be more competent than their
actual age. Moreover, since high profile adults also appear
not to differentiate age appearance between preterm and
full-term infants, they may expect preterm infants to be as
competent as full-term infants. Thus, the advantage of
"looking" younger for the premature infants may not play a
part in adult expectations, if the observer is a high
profile adult.

Finally, this study examined the influence of adult and
infant characteristics on adult perceptions of infant
emotion. The data suggested that high profile adults,
overall, perceived infants as less happy than low profile
adults. In summary, data from this study suggest that

adults with characteristics found in dysfunctional parents,
in general, perceive infants as less attractive, older, and
less happy than adults without these characteristics
supporting the speculation that aversive perceptions of
infants found in dysfunctional parents may be operating
prior to the actual parenting experience.

This study also supports the speculation that adult
characteristics, as well as infant characteristics, make
important contributions in perceptions of infants. Since
the majority of studies on inadequate parenting are
retrospective - using already identified maltreating
families - it has been difficult to separate the effects of
child characteristics from those of the parent. These
studies have been unable to address the possibility that the
breakdown of the caretaking process may have started prior
to the birth of the infant (Pianta, Egeland & Erickson,
1989). The results of this study, although highly
tentative, suggest that this breakdown may indeed be
operating prior to actual parenting experience.

In addition, the results of the present study support
current transactional models suggesting that characteristics
of the adult, the child, the environment and their
interactions influence the course of development (Belsky,
1980; Cicchetti, 1989; and Sameroff & Chandler, 1975). The
data also support the assumption that while dyads that are
characterized by a single risk factor (e.g., infant

prematurity, infant unattractiveness, parental abuse potential) are at increased risk for a negative outcome, the cumulative - and sometime interactive - effect of the multiple risk factors results in dyads passing the threshold for negative outcomes (Rutter, 1983). Specifically, the univariate simple effects two-way interactions involving Infant Expression and Infant Birth Condition were not significant for either Adult Group, but when all three factors were present, significant effects on ratings were obtained. A similar pattern was attained for Adult Group, Infant Expression and Infant Age whereby the additive effects of premature birth, neutral infant expression, young infant age and high profile adult and their interactions, may have a particularly strong effect on ratings of attractiveness.

The intent of this study was not to emphasize adult and child influences to the exclusion of environmental influences. Rather, it was intended to provided the identification of possible variables that may place individuals at risk and to help further the understanding of the complex developmental nature of parent-child relationships.

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VITA

The author, Christine Gesell Anderson, is the wife of
Thomas, mother of Julie and Brittany, and daughter of Elmer
and Arlene Gesell. She was born August 8, 1952, in
Waukegan, Illinois.

Her elementary education was obtained in the public
schools of Zion and Waukegan, Illinois. Her secondary
education was completed in 1970 at the Waukegan Township
High School, Waukegan, Illinois.

In June 1979, Ms. Anderson entered Lake County College,
receiving the degree of Associated of Arts in Psychology in
December 1982. In January 1983 she entered Northeastern
Illinois University and received the degree of Bachelor of
Arts with high honors in August 1984 in Psychology and
Social Science.

In September 1984, Ms. Anderson entered George Williams
College. While attending George Williams College, she was
awarded academic fellowships for two years. In January
1986, she entered Illinois Benedictine College and received
a Master of Science degree in Counseling Psychology.

In August 1986, Ms. Anderson entered the Ph.D. program
in Developmental Psychology at Loyola University of Chicago.

She was awarded a full research assistantship from the
graduate school for three years. She received a Master of
Arts degree in Developmental Psychology, May 1990.

APPROVAL SHEET

The dissertation submitted by Christine Gesell Anderson has
been read and approved by the following committee:

    Dr. Deborah L. Holmes, Director
    Vice President, Academic Affairs
    Loyola University Chicago

    Dr. Jill N. Reich
    Chairperson, Psychology Department
    Loyola University Chicago

    Dr. Carol Harding
    Chairperson, Counseling and Education Department
    Loyola University Chicago

    Dr. Bernard Dugoni
    Assistant Professor, Social Psychology
    Loyola University Chicago

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

The dissertation is therefore accepted in partial
fulfillment of the requirements for the degree of Doctor of
Philosophy.

Dec 3, 1993   _Deborah L. Holmes_
Date   Director's Signature