EFFECTS OF A LEARNED HELPLESSNESS TASK AND INFANT TEMPERAMENT ON MOTHERS' RESPONSIVITY TO INFANT CRY SOUNDS

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(ABSTRACT)

Mothers' susceptibility to the effects of learned helplessness as a function of the perception of her own infants' temperament and exposure to varying degrees of control over infant crying was explored. Seventy-six mothers were classified as having a difficult or easy infant based upon ratings of their infant on the Infant Characteristics Questionnaire. Using an adaptation of the learned helplessness paradigm, a relatively equal number of mothers from each group were exposed to an escape, inescape, or control pretreatment condition and subsequently tested on a solvable shuttle box task. Mothers of easy infants who were pretreated with inescapable crying demonstrated more failures and trials to criterion than mothers of easy infants in the escape and control conditions. In contrast, mothers of difficult infants did not demonstrate performance differences across the 3 pretreatment conditions. Mothers of difficult infants performed significantly better on the shuttle box task than mothers of easy infants following exposure to uncontrollable crying. Mothers of difficult and easy infants did not differ on measures of depression, perceptions of control over adult-child interactions, and po-

tential for child abuse. Mothers did not respond more rapidly to the cries produced by unfamiliar difficult or easy infants. Findings suggest mothers of difficult infants may initially be less adept at terminating infant crying, but are more resilient to these failure experiences. Indeed, mothers of difficult infants responded more effectively following exposure to uncontrollable infant cry sounds. Results are discussed in terms of the importance of mothers' perceptions of their different caregiving experiences in mediating their responsivity to salient infant cues.

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TABLE OF CONTENTS

LIST OF TABLES

LITERATURE REVIEW

The importance of consistent and sensitive parenting to the social and cognitive development of young children has been well supported (e.g., Lamb & Easerbrooks, 1981). The past two decades have evidenced growing interest in characteristics of the child that may mediate adult responsivity, particularily in the area of infant temperament (e.g., Thomas, Chess & Birch, 1968). Several studies suggest, for example, that irritable infants or infants with a difficult temperament receive less responsive caretaking than infants with an easy temperament (Crockenberg, 1986). Gerwitz (1977) suggests that a mother who initially responds promptly and consistently to infant cues will become less responsive if her infant is difficult to sooth and care for. Failure of a caregiver to control an irritable infant's crying may induce feelings of helplessness or ineffectiveness in the parent, which may disrupt subsequent parent-child interactions. The investigation of maternal responding to infant cry sounds offers one empirical approach to elucidate the role of learned helplessness in understanding differential responsivity to infants perceived as temperamentally more difficult.

DEFINITIONS OF PARENTAL SENSITIVITY

Parental sensitivity refers to an adult's ability to provide contingent, appropriate, and consistent responses to an infant's signals or

needs (Lamb & Easterbrooks, 1981). Caregiver sensitivity entails the perception and accurate interpretation of the infant's or child's signal, as well as the knowledge and implementation of an appropriate response (Ainsworth, 1967). A deficiency in any one of these processes, perception, interpretation, knowledge and/or implementation, could result in insensitive caregiver behaviors. Parental sensitive and responsive behavior can only be determined when considering the context of the child behavior in which it occurs (Cairns, 1979). Although initiating and/or maintaining play would appear appropriate in response to an infant who is alert and smiling, for example, the same caregiver behavior may be considered "insensitive" if the infant appears fussy and tired. Play behavior in each of these "child contexts" may have a different effect on the infant.

IMPORTANCE OF PARENTAL SENSITIVITY

Parental sensitivity to infants' cues, particularly signals of distress, has several immediate and distal effects upon the infant's development. Infants who consistently received more immediate and appropriate (effective) responses when distressed, for example, subsequently cried less, showed more regular rhythms and had longer periods of sleep, suggesting sensitive caregiving helps infants to attain homeostatic control over their state fluctuations (Sander, Stechler, Burns & Lee, 1979). Lamb (1981) suggested that caregiver response to infant distress signals provides the opportunity for important episodes of social learning, as

caregivers responses should be fairly consistent and salient to the infant. Specifically, these continuous distress-relief sequences between the caregiver and infant should allow the infant to: 1) learn that distress predictably elicits an intervention that brings relief; 2) recognize the person responsible for facilitating the transition from displeasure (high state of arousal) to pleasure; 3) develop an integrated concept of the caretaker and 4) associate the caretaker with the desirable outcome that he/she produces (p. 159). The development of a sense of personal effectance, as well as expectations of others' behavior, appear to be facilitated by parental sensitivity.

Infants' Cognitive Development

The importance of parents engaging in contingent and sensitive responding with their children becomes evident when reviewing theoretical and empirical work on the development of secure attachments and child competence (e.g., Ainsworth, 1979; Bell & Ainsworth, 1972). Infants as young as 4 to 8 weeks of age are able to perceive the contingency between their physical actions and external events (DeCasper & Carstens, 1981; Watson & Ramey, 1972), which infants appear to learn through interactions with their caregivers (Lewis & Goldberg, 1969). More immediate and greater responsiveness (e.g., look, touch, hold, smile) to infants' cries and vocalizations has, for example, been associated with more advanced cognitive development, as indexed by the infant's speed of response decrement to repeated stimulation (Lewis & Goldberg, 1969). A high level of maternal interaction and responses contingent upon infant behavior have also been positively correlated with Mental Development Index (MDI)

scores of the Bayley Scales of Infant Development (Lewis & Coates, 1980). Although other factors may clearly influence infants' cognitive development, measures of total stimulation were negatively correlated with MDI scores, emphasizing the importance of responses being contingent upon the infant's behavior. Indeed, work by DeCasper and Carstans (1981) supports a contingency theory of operant learning among newborns.

Findings by Donovan and Leavitt (1978) also suggest that the quantity of stimulation is not as significant as the quality or sensitivity of responses to infants' cognitive development. Although the total number of caregiver behaviors did not differ, mothers who acted in response to their infants' signals had infants who scored higher on a cognitive task compared to infants with less responsive mothers. Caregivers' emotional and verbal responsiveness to their child's cues, assessed when their infants were 20 months of age, were positively associated with their childrens' cognitive ability and social competence at 24 months (Bakeman & Brown, 1980). By continuously eliciting a predictable adult response the infant learns that it is effective, that it can elicit responses and thus partially determine its own experience.

Development of Secure Attachment

In addition to enhancing childrens' play and problem-solving ability, maternal sensitivity has also been associated with children's attachment behavior (Sroufe, 1979). Longitudinal work by Ainsworth and her collegues (e.g., Ainsworth, Bell & Stayton, 1971; Ainsworth, Blehar, Waters & Wall, 1978) has indicated that the contingency and predictability of the caregiver's behavior was a major determinant of the quality of the

relationship established between infants and their mothers. Mothers who had responded sensitively to their infants' signals had significantly more infants who were later classified as securely attached according to their performance in the strange situation procedure. In contrast, mothers who were initially insensitive to their infants' cues and provided little physical comfort had infants who were classified as either avoidant or ambivalent. More recent studies further suggest that mothers of anxious- avoidant infants are more unresponsive to their infants' cues than are mothers of securely attached infants (Belsky, Rovine, & Taylor, 1984; Smith & Pederson, 1987). In summarizing work concerning the influence of caregiver sensitivity on subsequent child competence and attachment, Lamb and Easterbrooks (1981) note that parental sensitivity is viewed as perhaps the most important determinant of individual differences in sociability among infants.

INFANT EFFECTS ON PARENTAL SENSITIVITY

A multiplicity of factors have been proposed to moderate caregiver responsivity to infant cues, encompassing characteristics of the infant (e.g., temperament), the caregiver (e.g., personality traits) and their environment (e.g., socioeconomic status). In postulating the role of the child in formulating parent-infant patterns of interaction, several authors (e.g., Bell, 1968; Korner, 1974) suggest that a decrement in positive maternal responses may occur as a result of infant behaviors that do not facilitate reciprocity in the infant-caregiver dyad. Gerwitz (1977), for example, emphasizes the role of infant temperament in modulating parental responsiveness, postulating that even a parent who initially responds promptly and frequently to infant cues will become less responsive if the infant continues to cry inexplicably and extensively, and thus becoming an aversive stimulus. Several studies exploring the association between difficult temperament and infant-caregiver interactions demonstrate the influence of the child's behavior in facilitating and maintaining parental responses.

CONSTRUCT OF DIFFICULT TEMPERAMENT

The most influential recent theory of temperament has developed from the New York Longitudinal Study conducted by Thomas and collegues (Thomas, Chess & Birch, 1968). These researchers delineated nine dimensions of temperament along which children were categorized as easy, difficult or

slow to warm up based on the qualitative or stylistic aspects of their behavior. Difficult temperament was defined as a a constellation of behaviors including irregularity of biological functions, tendency to withdraw from new situations or stimuli, slow adaptability to change, and tendencies for intense expression and negative mood. The term difficult temperament is thereby employed by several theorists to refer to infants and children who would appear more difficult for most, but not all, caregivers to interact with (e.g., Buss & Plomin 1984; Thomas et al., 1968).

Recently a debate has developed in the literature regarding the theoretical assumptions of temperament (see Goldsmith et al; 1987; Vaughn, Bradley, Joffe, Seifer & Barglow; 1987). One prominent issue concerns whether temperament reflects a constitutional property of the individual (e.g., Buss & Plomin, 1975; Thomas, Chess & Korn, 1982) or a social perception of the parent (e.g., Bates, 1982). This discrepancy appears primarily based on the generally low parent-observer and parent-parent convergence of temperament ratings (e.g., Bates, 1980; Crockenberg & Acredolo, 1983; Hubert, Wachs, Peters-Martin & Gandour, 1982). In addition, Bates, Freeland and Lounsbury (1979) found that maternal ratings of their infants' temperament as difficult on the Infant Characteristics Questionnaire (ICQ) were <u>best</u> predicted by a combination of caregiver characteristics including low extraversion, achievement orientation, primiparity and youth of parent. Similarly, ratings on the Infant Temperament Questionnaire (ITQ) (Carey, 1970) were associated more with demographic and psychological characteristics of the mothers than with the

infants' observed behavior (Sameroff, Seifer & Elias, 1982). Specifically, higher ratings of maternal anxiety and mental illness were associated with ratings of difficult temperament, as indicated by low rhythmicity, poor adaptability, low approach and negative mood. Data also suggest prenatal differences between mothers who subsequently perceive their infants as temperamentally difficult and those who perceive their infants as temperamentally easy. In contrast to mothers of easy infants, mothers of difficult infants expressed more fear for themselves and their unborn children, as well as an external locus of control during their last trimester of pregnancy (Vaughn, Deinard & Egeland, 1980; Vaughn et al, 1987). Findings of more anxiety, lower self-esteem, and more depression among mothers who perceive their infants as difficult have also been found in a sample of older, better educated women of higher socioeconomic status (Vaughn et al, 1987). These data suggest that characteristics of the caregiver may in general be more significant and independent of child characteristics in predicting temperament.

Although there only appears to be very minor if any correspondence between concurrent observational and parental ratings of infant temperament (Hubert, Wachs, Peters-Martin & Gandour, 1982), data clearly suggest individual differences in behavior during the early neonatal period which may contribute to mother-infant interaction. Differences among 2 to 3 day old neonates have been noted, for example, in the frequency and duration of crying, duration of waking activity, frequency of shifts in states, and response to soothing strategies (Korner, 1985; Korner & Thoman, 1972). The quality of the caregiving response (e.g., latency of

response, soothing technique, and duration of response) however, is likely to influence the infant's behavioral state and subsequent responsivity. For example, there generally appears to be a strong interrelationship between a mother's stimulation in a particular domain and the newborn's responsivity in that domain (Osofsky, 1976). Although it is difficult to clearly differentiate between independent infant and caregiver characteristics (e.g., Sameroff & Chandler, 1975), these two areas will be distinguished for purposes of discussion.

INFANT TEMPERAMENT AND MATERNAL RESPONSIVITY

In a review of the literature assessing the relation between difficult temperament and maternal responsivity, Crockenberg (1986) reported 14 studies which found at least one association between negative infant/child emotionality and maternal behavior. Nine of the 14 studies suggest mothers tend to be less responsive or offer less stimulating contact to infants who are perceived as more irritable or as having a difficult temperament (Campbell, 1979; Crockenberg & Acredolo, 1983; Dunn & Kendrick, 1980; Kelly, 1976; Klein, 1984; Lee & Bates, 1985; Linn & Horowitz, 1983; Milliones, 1978; Peters-Martin & Wachs, 1984). When infants were approximately one year of age, for example, mothers' ratings of difficult temperament were negatively correlated with a concurrent measure of maternal responsiveness completed by family specialists (Milliones, 1978).

In a longitudinal study of 64 infants to assess the association between infants' performance on the Neonatal Behavioral Assessment Scale (NBAS) (Brazelton, 1984), maternal ratings of infant temperament (Infant Characteristics Questionnaire) and caregiver-infant interactions, both observed infant fussiness and mothers' evaluations of infant temperament appeared fairly stable over a 3 month period (Isabella, Ward & Belsky, 1985). Results indicated that infants who were initially more adept at modulating control over their behavioral states and who demonstrated fewer behavioral signs of physiological stress were less likely to be reported as fussy or difficult by their mothers at 9 months of age. In

a similar study, infants who were rated as easy to test on the NBAS by the examiner, exhibited more alert states and were held by their mothers more during a feeding session than infants who were perceived as more difficult to test (Linn & Horowitz, 1983). In addition, those infants who were judged by the NBAS examiners to be more reinforcing were more likely to be alert, to look at their mothers more, and to be interacting with their mothers more compared to infants who were perceived as less reinforcing by an objective adult. Again these data suggest the importance of infant characteristics in facilitating and maintaining adult responsivity to infant cues.

Ratings of negative emotionality on the Infant Behavior Questionnaire (Rothbart, 1981) have been negatively correlated with involved maternal contact at one and three months of age (Crockenberg & Acredolo, 1983). A study by Peters-Martin and Wachs (1984), in which infant temperament was assessed at 1, 6 and 12 months using the Toddler Temperament Scale (Fullard, McDevitt & Carey, 1978) and maternal behavior was assessed at 12 months using the Caldwell HOME inventory, found that high intensity behaviors at 12 months of age were associated with less maternal involvement. In addition, negative mood displayed by babies was associated with more restriction and punishment, suggesting not only a decrement in maternal responsiveness to infants with irritable or difficult characteristics, but also differences in the quality of the maternal contact. Similarly, toddlers who were rated as difficult by their mothers received more restrictive parenting than did toddlers who were rated as having an easy or average temperament (Lee & Bates, 1985).

Other child characteristics, such as gender, may influence maternal responsivity to difficult infants. Although some data suggest there are no gender differences in the amount of crying during the early neonatal period (Korner, Chuck & Dontchos, 1968), mothers were more likely to attribute their daughters' cries to hunger, whereas mothers of sons were more likely to attibute their crying to crankiness (Shonk & Frodi, 1988). Mothers with sons also rated their infant's temperament as significantly more difficult on the ITQ and were observed to be less sensitive in their interactions compared to mothers of daughters. Mothers have also been shown to respond less to male irritable infants at 3 weeks of age, compared to female infants who were irritable, with the mothers' unresponsiveness to the irritable male infants increasing over a 3 month period (Moss, 1967). Based on these findings, Moss (1967) postulated that male babies were less consolable, thereby providing less rewarding responses to their mothers' caretaking and thus further decreasing their mothers' responsivity to their distress signals.

Interestingly, infants who were rated by their mothers on the Infant Characteristics Questionnaire (ICQ) (Bates et al, 1979) as difficult produced hunger cries with a higher fundamental frequency at peak, as well as longer and more frequent pauses between cry expirations in comparison to the cries of infants perceived by their parents as average or easy (Lounsbury & Bates, 1982). Unrelated primiparous mothers reported feeling more anger/irritation in response to the cries of the difficult infants, which they perceived as more spoiled. These higher-pitched cries were also more likely to be attributed to psychological/emotional rea-

sons, whereas the cries from infants with an easy temperament were attributed to routine physical discomfort.

In addition to confirming these findings, a separate investigation employing the same cry stimuli found that the cries produced by the difficult infants were perceived as significantly more grating, arousing, piercing and aversive and elicited fewer care for responses than the cries of the average or easy infants (Boukydis & Burgess, 1982). Multiparous parents who had rated their own infant as difficult on the ICQ (Bates et. al., 1979) rated the difficult infant cries as more similar to those of their own infant. Although not found for the primiparous parents, both multiparous and nonparents showed highest levels of arousal, as indexed by their skin potential level, in response to the difficult infant cries. Additional findings suggest that certain characteristics of cry sounds are also associated with the quality of caregiving responses (Zeskind & Collins, 1987).

In contrast to the work reviewed above, several studies suggest that mothers of difficult or irritable babies are more engaged with their babies compared to mothers of less irritable infants (Bates, Olson, Pettit & Bayles, 1982; Caron & Miller, 1981; Crockenberg & Smith, 1982; Fish & Crockenberg, 1981; Klein, 1984; Pettit & Bates, 1984; Peters-Martin & Wachs, 1984). Fish and Crockenberg (1981), for example, reported that infants who cried more and took longer to calm at 1 and 3 months had mothers who engaged in more interaction with them at 9 months of age. Although only modest findings, Bates and collegues (1982) found a positive correlation between a composite measure of infant difficultness (based

upon maternal ratings and behavioral observations) and observed maternal behavior. Babies identified as difficult by their mothers at 3 months of age were concurrently observed to receive more affection and object stimulation by their mothers (Bates, Olsen, Pettit & Bayles, 1982) with this pattern continuing when the infants were 13 months of age (Pettit & Bates, 1984). Crockenberg and Smith (1982) similarly observed mothers to engage in more involved contact with infants who were identified as irritable at 3 months of age. However, additional analyses indicated that baby fussiness was associated with more involved maternal contact only for first born children and for families with high socioeconomic status (Bates, 1985; cited in Crockenberg, 1986).

Although this discrepancy in the literature may be partially accounted for by differences in methodology, age of infant, parity and sample employed, it also suggests that an infant's temperament may be associated with positive or negative parent-child interactions depending upon the specific characteristics of the caregiver (Thomas & Chess, 1977). The pervasive influence of variations in parental sensitivity previously described demonstrates the importance of identifying the factors that determine and affect these individual differences among parents. Numerous characteristics, including personality traits, caregiving attitudes and physiological responsiveness have been proposed in an attempt to account for individual differences in parental sensitivity and responsivity to infant signals.

OTHER DETERMINANTS OF PARENTAL SENSITIVITY

Variables Related to Birth Experience

Some data indicate that characteristics of the parent and/or their experience, such as parity, influence parent's perceptions of their infant's temperament, as well as their caregiving responses. For example, a study by Donte-Bartfield and Passman (1985) indicated that primiparous parents responded to their infants' cries with a shorter latency than multiparous parents. Other work also suggests that primiparous mothers may attend more to their infants, although they appear to do so with less skill, being more likely to initiate an interaction rather than responding to their infants' cues (Bakeman & Brown, 1977). However, multiparous parents who experienced a vaginal delivery expected temperamently more optimal infants and subsequently rated their infants more positively on the ICQ than did primiparous parents or parents who experienced a cesarean (Mebert & Kalinowski, 1984). Mebert and Kalinowski (1984) suggest that differences in parental perceptions of their infants' temperament may be a function of factors associated with the mode of delivery (e.g., extended hospitalization, increased medication, greater family support), and parity (e.g., age, parenting experience) rather than these factors per se.

Personality Characteristics

Early discussions of parental sensitivity implied that it reflected enduring personality traits or predispositions. Lamb and Easterbrooks (1981) suggested the personality characteristics of self-centeredness and adaptability are particularly relevant to parents' abilities to monitor,

interpret and appropriately respond to ambiguous infant cues. Self-centeredness may lead the parent to satisfy his/her own needs before fulfilling the needs of the infant, while low adaptability may inhibit the caregiver from responding to ambiguous cues displayed by the infant. In contrast, Ainsworth and collegues (e.g., Ainsworth, Bell & Stayton, 1971; Ainsworth, Blehar, Waters & Wall, 1978) identified four dimensions of parental personality, sensitive-insensitive, accepting-rejecting, co-operative- interfering, and accessible-ignoring that appear to predict qualitative differences in later mother-infant attachment. Providing some overlap with these dimensions, five traits that possibly yield insensitive parental behavior; ignorance, intolerance, disinterest, carelessness and excessive indulgence were identified from the literature on maternal neglect (Brody & Alexrad, 1978).

Situational and Attitudinal Determinants

Other theorists tend to emphasize situational and attitudinal determinants of parental sensitivity. Skinner (1985) presents data suggesting that consistent and appropriate responding to children's cues may be a consequence of parental beliefs (as well as other factors). Specifically, the beliefs that it is important to assess a child's understanding of the situation, to take the child's feelings and views into consideration when making decisions and to make outcomes contingent upon the current state of the child, were proposed to lead to more sensitive parental responses. In addition, the importance of an adult's ability to flexibly adapt to new or ambiguous situations (Lamb & Easterbrooks, 1981) appears supported by data indicating that mothers with more re-

sponsive and flexible attitudes engage in more involved contact and respond to their infants' cries more quickly than mothers with more rigid attitudes (Crockenberg & Smith, 1982).

In extreme cases, rigid attitudes towards childrearing may be one factor leading to dysfunctional parenting. Pruitt and Erickson (1985) classified non-parent adults as having a high or low potential for engaging in child abuse based upon their scores on the Child Abuse Potential (CAP) Inventory (Milner & Wimberley, 1979; 1980). The CAP was constructed to assess parental perceptions in seven areas; distress, rigidity, child with problems, problems from family and others, unhappiness, loneliness, and negative concept of child and self. In contrast to the low scoring adults, adults scoring high on the CAP distinguished less between various infant cues, as indexed by their physiological responses, and generally appeared more defensive in response to infant smiles and cries. In a separate investigation, non-parent adults scoring high on the CAP appeared marginally more aroused, as indexed by their resting heart rate, after listening to infant crying than adults scoring low on the CAP (Crowe & Zeskind, 1988).

A similar physiological response pattern to infant cues, suggesting little discrimination between pleasant and stressful infant signals, as well as increased arousal, has been observed among known child abusers (Disbrow, Doer & Caulfield, 1977; Frodi & Lamb, 1980). Additional data suggest child abusers fail to recognize the visual presentation of infant emotional cues, identifying negative signals as positive significantly more than control parents (Kropp & Haynes, 1987). In an observational

study, although abusers appropriately attempted to initiate interaction with their infants they did not appear to act in response to their infants' cues, resulting in greater fussing, gaze aversion and refusals among their infants (Crittenden, 1981). These data suggest that child abusers and/or adults with a higher potential for committing abuse (as assessed by the CAP) do not have the ability, knowledge or motivation to accurately perceive and/or interpret various infant cues displayed by their own or other infants.

Interestingly, mothers who perceive their own infant as having a difficult temperament also appear less physiologically responsive to changes in infant cues (Donovan, Leavitt & Balling, 1978). Mothers of easy infants exhibited cardiac deceleration in response to a change from smile to cry stimuli and biphasic cardiac responses to changes from cry to smile infant stimuli. In contrast, mothers who rated their child as difficult on the Infant Temperament Questionnaire did not demonstrate significant physiological responses to these changes in infant's cues. Mothers who perceived their infants as difficult also failed to demonstrate physiological responses to changes in infant gaze behavior (Leavitt & Donovan, 1979), whereas mothers who described their infants as easy responded to changes in the infants' averted to direct gaze with cardiac deceleration.

Several laboratory investigations have demonstrated that adults' attributions about infants may have a greater influence on adults' perceptions and reactivity than the infants' actual characteristics. The social status, anxiety level, and mental health status of the mother, for

example, were all related to temperament ratings on the ITQ (Sameroff, Seifer & Elias, 1982). Specifically, higher anxiety levels and mental illness were correlated with ratings of low rhythmicity, poor adaptability, low approach and negative mood. Additional studies suggest a link between mothers' level of anxiety, depression and self-esteem with ratings of difficult temperament (e.g., Vaughn, Deinard & Egeland, 1980; Vaughn et al, 1987), as well as an association between prenatal maternal expectations of temperament and ratings of infant temperament (Mebert & Kalinowski, 1984). Other findings appear contradictory, with some data indicating that multiparous, extraverted mothers tend to rate their infants as more easy (Bates et al, 1979), and other data indicating that mothers with more children perceive them as more difficult than mothers with fewer children (Sameroff, 1974). These cumulative findings suggest that temperament classifications based on parental report measures are more reflective of parents' perceptions of their infants than constitutional characteristics of infants.

In an investigation by Frodi and collegues (1978) the same stimulus infant was described as either normal, difficult, or premature to adult subjects who viewed the infant smiling and crying. Skin conductance response to the cry labelled premature was significantly greater than when the cry was labelled as normal. In addition, the crying and smiling infants labelled as difficult and premature elicited fewer verbal responses of sympathy than the "normal" infant. In sum, adults who believed they were viewing and hearing a premature/ difficult infant crying responded with more negative affect and arousal than adults who believed the same

infant stimuli were obtained from a full-term infant (Frodi, Lamb, Leavitt, Donovan, Neff & Sherry, 1978).

The influence of parental beliefs about the causes of caregiving outcomes on adult responsivity to difficult versus easy child behavior has been explored. The Parent Attribution Test (PAT) (Bugental & Shennum, 1984) was constructed to assess adults beliefs about their and the child's contributions to the success or failure of an interaction. Adults with high control attributions (e.g., emphasizing ability as an important determinant of interaction success) demonstrated similar affective reactions when interacting with responsive and unresponsive children (Bugental & Shennum, 1984). In contrast, adults characterized by low control attributions (e.g., perceived outcome as dependent upon random circumstances or characteristics of the child) exhibited relatively strong, positive affect in response to easy children and weak, negative affect when interacting with difficult children. These findings appear to indicate that adults who perceive themselves as having little control over parent-child interactions will be more reactive to the individual characteristics of the child.

In a second investigation employing the PAT, Bugental and Cortez (1988) presented nonparent women with high- and low-control attibutions for parenting success and failure with a videotape depicting either a responsive or an unresponsive child interacting with an adult. Several physiological measures were monitored while subjects viewed the videotape and during a 5 minute period in which the subject was waiting to interact with the child they had just watched. Reactions were greater to unre-

sponsive than responsive children on measures of heart rate, skin conductance and temperature for both groups of adults. However, unlike high-control women, women with low-control attributions did not demonstrate any reduction in their heart rate levels from baseline while viewing an unresponsive child. In fact, low-control women continued to show an elevated heart-rate level and higher skin conductance while waiting to meet the unresponsive child.

Bugental and Cortez (1988) interpreted these cumulative findings as indicating that attributions of low control act to sensitize adults to difficult child behaviors, whereas attributions of high control act to buffer adults from difficult or unresponsive child behaviors. Difficult or unresponsive child behavior is conceptualized as one form of environmental uncontrollability. Several other findings suggest that individuals who perceive themselves as lacking personal control are more reactive to challanging situations and more prone to the debilitating effects of learned helplessness (e.g., Dweck & Repucci, 1973; Hiroto, 1974; Pittman & Pittman, 1979). Learned helplessness theory appears to have some utility in understanding several processes that may affect maternal sensitivity to various infant cues.

LEARNED HELPLESSNESS THEORY

Briefly, a theory of learned helplessness (Seligman, 1975) postulates that individuals who are exposed to uncontrollable events learn that outcomes are independent from their own behavior. This perception of

non-contingency proactively interferes with the individual's response to future events in which control can be extended. In addition, the process engendered in learned helplessness debilitates performance beyond the conditions under which helplessness was conditioned (Hiroto & Seligman, 1975). Helplessness theory espouses that learning that outcomes are independent from one's responses results in three deficits; motivational, cognitive and emotional. Mere exposure to uncontrollability is not sufficient to induce helplessness, rather the individual must come to expect that outcomes are uncontrollable, which will result in the retarded initiation of voluntary responses (motivational component), greater difficulty in learning successful responses (cognitive component), and depressed affect (emotional component).

Although learned helplessness theory was originally formulated on the basis of laboratory experiments with animals, Abramson, Seligman and Teasdale (1978) proposed an expanded model in order to address several deficits that emerged in generalizing the original model to human subjects. Specifically, these authors proposed that a person's attributions about the cause of non-contingency determines the person's subsequent expectations for future non-contingency, which in turn determines both the kind of deficit and its generality and chronicity. People's attributions are classified along three orthogonal dimensions; internal- external, stable-unstable and global-specific. Attributing uncontrollable bad events to internal, stable and global factors leads to more debilitating helplessness effects.

Maternal Learned Helplessness and Response to Infant Cries

The investigation of maternal responding to neonatal cries offers one empirical approach to elucidate the role of learned helplessness in understanding differential responsivity to difficult infants. Although their research has been criticized (Gerwitz, 1972), Bell and Ainsworth (1972) provide some evidence that promptness of maternal response to an infant's cry is associated with a later decline in the frequency and duration of infant crying, as well as perceptions of effectiveness. Mothers who initially ignored or were delayed in their responding had babies who cried more persistently in the future. These mothers reported feeling more discouraged, and further decreased the promptness of their responding, which resulted in increased infant irritability. Failure of a caregiver to control an infant's cry (which may be associated with infant temperament and soothability) may induce what appears to be learned helplessness on the part of the parent, and disrupt subsequent parent-child interactions.

Laboratory investigations adapting the learned helplessness paradigm (Hiroto & Seligman, 1975) provide some support for the above conceptualization. Following the triadic design typically employed in investigations of learned helplessness, Kevill and Kirkland (1978) exposed 71 nonparent women to 50 5 second trials of either a neonatal pain cry or white noise (3 KHz, 90 db). Subjects were randomly assigned to one of three conditions; an escapable condition in which completing a button-press response 4 times would terminate the sound, an inescapable condition in which subjects responses could not terminate the sound, and a control group in which subjects passively listened to the sound. Throughout the

task subjects received feedback on their performance with either a red light labelled "time up" or a green light labelled "signal off" illuminating during each trial. All subjects were subsequently instructed to solve a series of 20 anagrams, all of which were scrambled in the same order. Regardless of the noise source (pain cry or white noise) subjects in the inescapable condition took longer to solve the anagrams, required more trials to learn the anagram code, and experienced more failures compared to subjects in both the escapable and control conditions. The authors concluded that women in the inescapable condition experienced learned helplessness, demonstrating a motivational deficit as well as a "negative cognitive set" (Miller & Seligman, 1975).

Donovan (1981) completed a similar investigation employing 49 mothers of 3 to 4 month old infants. During the pretreatment phase, which consisted of 35 trials of unsignaled 5-second cries (80 db), mothers were assigned to escapable, nonescapable and control conditions. Mothers assigned to the inescapable and control groups were yoked to mothers in the escape group to insure that women from each group were exposed to the same pattern and duration of cry sounds. Following the pretreatment task all women were presented with a solvable instrumental task, which required sliding a knob to either side of a small shuttle box in order to terminate the cry stimulus. A red light bulb was illuminated 10 seconds prior to cry onset and terminated when the cry signal began. Heart rate was monitored throughout both tasks. Each mother also completed the ITQ (Carey, 1970) following participation in the above experiment.

Mothers pretreated with inescapable crying demonstrated significantly poorer performance on all three dependent measures; mean number of trials to criterion, mean number of failures to escape, and mean response latency. Independent of their assignment to the escape, nonescape or control conditions, however, mothers who rated their children as having a difficult temperament tended to show debilitated performance on the second instrumental task compared to mothers of easy infants. During the second instrumental task, only mothers who were initially given control over cry termination exhibited a deceleratory cardiac response to the light stimulus preceding cry onset. Donovan (1981) suggested that the performance differences between the escapable and inescapable groups may be due to differential processing of cues signaling cry onset, as mothers with previous control over cry termination exhibited heart rate deceleration, which has been proposed to facilitate stimulus intake (Lacey, 1967).

A second set of studies were completed in order to explore the effects of internal versus external locus of control in the development of learned helplessness (Donovan & Leavitt, 1985). Prior to the beginning of the experimental tasks, mothers were classified as having expectancies of internal or external control based upon their answers to Rotter's (1966) Locus of Control Questionnaire. Briefly, individuals with an internal locus of control tend to perceive outcomes as dependent upon their own behavior, while individuals with an external locus of control view factors beyond their control (e.g., luck, chance) as instrumental in effecting reinforcement. In contrast to some previous findings (e.g.,

Albert & Geller, 1979; Hiroto, 1974), the locus of control factor failed to yield significant effects on any of the three dependent variables. Although the lack of any significant findings may be attributable to a small cell size (N = 5), Miller and Seligman (1975) also failed to find performance differences between people espousing an internal and external locus of control to non-contingent reinforcement.

According to the revised theory (Abramson, Seligman & Teasdale, 1978), helplessness is predicted to be most prevalent when attributions regarding one's failure are internal, global, and stable. In contrast, attributing failure to specific and/or unstable factors is likely to attenuate the helplessness effects. To test the prediction that an attribution for failure that is specific to one situation will help buffer against the development of helplessness, Donovan and Leavitt (1985) informed 16 mothers exposed to the nonescape condition (no control over cry termination) that their performance on the second (solvable) task was unrelated to their performance on the first task. Mothers provided with the specific attribution for failure out-performed mothers in the nonescape-nonintervention condition, while not differing from mothers who experienced success in controlling cries on mean number of trials to criterion, and mean response latency.

These findings appear congruent with work by Cole and Coyne (1977), who failed to find performance deficits among subjects pretreated with inescapable aversive tones when subjects were informed that the second solvable task was part of a separate investigation. Similarly, children pretreated with unsolvable problems subsequently displayed performance

deficits on a solvable task if presented by the original experimenter, but not when tested by a different experimenter (Dweck & Reppucci, 1973). Although these data have been interpreted as support for the utility of providing specific attributions for failure in order to attenuate the debilitating effects of helplessness (e.g., Donovan & Leavitt, 1985), the absence of situational demand characteristics may also account for these findings. The situational characteristics of the pretreatment and test tasks are the same in most investigations of learned helplessness, with subjects perceiving both tasks as part of the same experiment (Hiroto & Seligman, 1975).

To further explore the role of attributions in learned helplessness theory Donovan and Leavitt (1985) attributed the identical cry stimulus to an infant with an easy or difficult temperament. Results indicated that mothers pretreated with inescapable cries and mothers receiving the difficult cry attribution demonstrated debilitated performance in terminating cries when presented with a solvable task. The authors concluded that adults' perceptions of infant temperamental styles affect maternal responses. Although this hypothesis appears consistent with data associating lowered maternal responsiveness with mothers who perceive their infant as difficult (e.g., Milliones, 1978), and more negative affect in response to cries attributed to difficult infants, the effect of demand characteristics cannot be ruled out.

Donovan and collegues expanded their work with the learned helplessness paradigm to incorporate mothers who demonstrated a high illusion of control or greatly overestimated their ability to successfully

terminate uncontrollable cry sounds (Donovan & Leavitt, 1986; Donovan, Leavitt & Walsh, 1988). Individuals with a high illusion of control demonstrate a self-serving attributional bias by attributing successful outcomes to internal factors. Illusion of control was estimated by subtracting actual control, according to a predetermined schedule of cry termination (success) or continuation (failure), from subjects' estimated control.

Interestingly, mothers who overestimated their control demonstrated greater susceptibility to learned helplessness as evidenced by debilitated performance on trials to criterion, failures to escape and response latency (Donovan et al, 1988). In addition, mothers from both the high and low illusion groups failed to show the "attentive", deceleratory heart rate response during the anticipatory period preceding each cry. Mothers who overestimated their control over crying were also depression-prone, experienced the most home/work conflict, reported low participation of the father in childcare and perceived their babies as temperamentally more difficult (Donovan & Leavitt, 1986). The authors interpreted these findings as evidence that a high illusion of control may be an ineffective means of coping with child-care tasks, as a mother's ability to learn from past experiences appears limited.

These findings appear to contradict other studies of learned helplessness which found that subjects who believed that they had control over an aversive stimulus subsequently showed better performance on another task than did subjects who perceived themselves unable to terminate the stimulus, despite the fact the neither group could actually exert

control during the pretreatment phase (Geer, Davison & Gatchel, 1970; Glass & Singer, 1972). Although this discrepancy may be accounted for by the different stimuli and procedures employed, the investigation of additional hypotheses appears warranted. Perhaps the mothers in the Donovan and Leavitt (1988) study who perceived their infants as more difficult were less sensitive to their infants' cues and correspondingly less sensitive to monitoring other signals, such as successful cry termination. These mothers may have overestimated the number of successful cry terminations, yet still maintain an external attribution for success (such as chance factors), and thereby demonstrate debilitated performance on the second task.

THE PRESENT STUDY

Work by Donovan (1981) and others (e.g., Kevill & Kirkland, 1980) indicates that mothers in a nonescape condition demonstrate more difficulty in terminating cry sounds than mothers in both escape and control conditions. Based on some preliminary findings, Donovan and Leavitt (1985) proposed that, to the extent that a mother feels she has no control over her own difficult infant, a state of helplessness or reduced responsiveness will emerge. However, in Donovan and Leavitt's study mothers rated their infants' temperament following participation in the learned helplessnes paradigm, making it difficult to determine whether infant temperament influenced mothers' ability to terminate cry sounds or pretreatment condition (escape, nonescape, control) influenced mothers' ratings of their infants' temperament. In order to control for these confounding factors, mothers in the present study will complete the Infant Characteristics Questionnaire (ICQ) (Bates et al., 1979) prior to their participation, and an equal number of mothers who perceive their infants as easy or difficult will be assigned to each experimental condition (escape, inescape or control). As mothers who perceive their infants as difficult are more likely to experience unsuccessful caretaking responses, such as soothing their crying infant, it is hypothesized that mothers who rate their infant as difficult on the ICQ will demonstrate more difficulty in terminating a cry signal, regardless of experimental condition, compared to mothers who rate their infant as easy.

Hypothesis 1: All mothers in the inescape condition will demonstrate more failures to escape, more trials to response criterion and a longer response latency than mothers in the escape and control conditions.

Hypothesis 2: Mothers who perceive their infants as difficult will demonstrate more failures to terminate a cry signal, more trials to reach escape criterion and a longer response latency than mothers who perceive their infants as easy.

Further, Donovan and Leavitt (1985) found that mothers who believed they were responding to the cry of a difficult infant exhibited reliably more difficulty in terminating the cry than mothers who believed they were responding to the cry of an easy infant, even though the identical cry stimulus was presented to all mothers. Although these findings may have resulted from experimental demand characteristics, additional data suggest differential responsivity to the cries of difficult and easy infants. Infants rated as difficult on the ICQ produced hunger cries with a higher fundamental frequency at peak intensity, one factor shown to be important to maternal perception of infant cry sounds (Zeskind & Marshall, 1988). In comparison to the cries of the easy infants, the higher-pitched cries of the difficult infants were perceived as reliably more arousing and aversive, attributed to more emotional causes (e.g., spoiled), associated with more feelings of anger/irritation, as well as fewer care for responses and greater physiological arousal (Boukydis & Burgess, 1982; Lounsbury & Bates, 1982). Interestingly, mothers of difficult infants rated the cries from unfamiliar difficult infants as more similar to their own child's cry compared to mothers of easy infants (Boukydis & Burgess, 1982). These cumulative findings suggest that mothers may respond less

effectively to the cries of difficult infants, particularly those cries with a higher fundamental frequency at peak intensity.

Hypothesis 3: Mothers will demonstrate a longer response latency when exposed to cries produced by difficult infants.

Hypothesis 4: Mothers of difficult infants will rate the cries produced by unfamiliar difficult infants as more similar to their own infants' cry than mothers of easy infants.

In addition, some data indicate that individuals who attribute failure to global and stable factors appear to be more susceptible to the effects of learned helplessness (e.g., Albert & Geller, 1978; Donovan & Leavitt, 1985; Hiroto, 1974). Indeed, work by Bugental and collegues (e.g., Bugental & Cortez, 1988) suggests that attributions of low-control act to sensitize adults to difficult (unresponsive) child behaviors. However, Donovan and Leavitt (1985) failed to find differences in susceptibility to learned helplessness between mothers with an internal or external locus of control (Rotter, 1966). This discrepancy in findings may have resulted from the use of different measures to assess perceptions of control. Whereas Donovan and Leavitt (1985) employed a general measure (Rotter, 1966), Bugental and Cortez (1988) employed the Parent Attribution Test (PAT) (Bugental & Shennum, 1984), designed specifically to assess adults' attributions regarding parenting success and failure. As the PAT assesses attributions specific to parenting success and failure, it would appear to be a better indicator of mothers' susceptibility to learned helplessness involving the termination of infant cry sounds (which may be viewed as an analog caregiving task). Interestingly, mothers who perceive their infants as temperamentally difficult are more

likely to experience an external locus of control than are mothers of easy infants (Vaughn, et al., 1980).

In addition to the PAT, the Child Abuse Potential (CAP) Inventory would also appear to assess mothers' susceptibility to learned helplessness. Scores on the CAP have been significantly correlated with scores on the Rotter Internal-External Control Scale (Ellis & Milner, 1981). Findings also suggest that the CAP measures stressors that are specific to the parent-child relationship (Talbott, unpublished data; cited in Milner, 1980). The CAP may therefore be useful to discriminate between mothers who are and are not experiencing stressful parent-infant interactions. Mothers with higher scores on the CAP, indicating greater stress, may be more susceptible to the effects of learned helplessness, as they may have experienced more caregiving failures. Similarly, mothers who perceive their infants as temperamentally difficult appear more likely to experience parenting as stressful compared to mothers of easy infants. Previous findings also suggest that depression is associated with greater susceptibility to learned helplessness (e.g., Seligman, 1975), as well as mothers' perceptions of their infants as difficult (Vaughn et al., 1987).

Hypothesis 5: Scores on the Beck Depression Inventory, Child Abuse Potential Inventory, and Parent Attribution Test will be predictive of impaired performance in terminating the cry stimuli.

Hypothesis 6: Mothers who perceive their infants as difficult will score higher on the Beck Depression Inventory, Child Abuse Potential Inventory and Parent Attribution Test than mothers who perceive their infants as easy.

Finally, this study will further explore the counter-intuitive findings by Donovan and Leavitt (1986) that mothers who overestimated their control demonstrated impaired performance on a learned helplessness task and perceived their infants as more temperamentally difficult, compared to mothers with more accurate perceptions of control. As mothers of difficult infants are more likely to espouse an external locus of control (Vaughn et al., 1980), and experience less successful caretaking, it appears that mothers of difficult infants would be more likely to underestimate their degree of control, particularly in regard to child-care tasks.

Hypothesis 7: Mothers of difficult infants will underestimate their degree of control over cry termination compared to mothers of easy infants.

METHOD

Design

The design of the present study will be similar to that of other investigations of maternal learned helplessness in response to infant cries (e.g., Donovan, 1981). Subjects will be exposed to an instrumental pretreatment task designed to induce varying levels of control, followed by an instrumental test for helplessness. Three pretreatment conditions will be employed, escape, in which subjects can effectively terminate a series of cry sounds, nonescape, in which subjects'attempts to terminate cry sounds will be ineffective, and control, in which subjects will passively listen to a series of cries. Subjects will subsequently be exposed to a second instrumental task, for which all subjects can effectively terminate a series of cries. Mean number of failures to escape, mean response latency and mean number of trials to criterion will all be assessed. A 2 Infant temperament (easy, difficult) by 3 Pretreatment condition (escape, inescape, control) by 2 Cry stimulus (easy, difficult) mixed factorial design will be employed. Infant temperament and pretreatment condition are both between subject factors, while cry stimuli represents a within subjects factor. Based upon mothers' responses on the ICQ, infants will be classified as temperamentally easy or difficult.

Subjects

Mothers in the Montgomery County regional area whose names appeared in the birth announcements were contacted by phone and asked to complete

a set of questionnaires pertaining to their parenting experience. Mothers were told that once their questionnaires were returned, they may be asked to participate in a project concerning maternal responsivity to infant cry sounds for which they would receive 20 dollars renumeration. Approximately 87% (N=112) of contacted mothers agreed to participate. Questionnaires were received from 106 mothers, of whom 76 were asked and agreed to participate in this project.

Mothers participating in this project comprised a fairly homogenous sample. Mothers were predominantly Caucasian (97%) and represented the middle to upper-middle social strata, with a mean social index of 50.95 (SD = 12.18) (Hollingshead, 1975). Their mean age was 28.37 (SD = 4.58) and their mean education was 15.03 (SD = 2.41). All of the mothers except two were currently married and 55 % of the sample were first time mothers. Their infants ranged in age from 3 1/2 to 6 months and were almost equally divided among males (N=40) and females (N = 36). Mothers comprising this sample scored in the normal range on the Beck Depression Inventory (M = 6.24, SD = 5.77) and the Child Abuse Potential Inventory (M = 58.97, SD = 42.16).

Mothers were selected and divided into two groups based on their descriptions of their own infants on the Fussy-Difficult factor of the Infant Characteristics Questionnaire (ICQ) (Bates et al., 1979). Specifically, mothers scoring 19 or above (M = 23.52, SD = 3.20; Range = 19 to 35) were considered as perceiving their infants as more temperamentally difficult, and mothers scoring 14 or below (M = 12.45, SD = 2.73; Range = 8 to 14) were considered as perceiving their infants as temperamentally

easy. Based on these criteria, the mean score for the easy and difficult groups were approximately one standard deviation below and above the average score on this factor (M = 17.77, SD = 5.88) as reported by Bates et al., (1979). Mothers who perceived their infants as more difficult, also rated their infants significantly higher on the Unadaptable and Unpredictable factors of the ICQ. Means and standard deviations on these factors are listed in Table 1. The two groups did not significantly differ on any of the demographic variables described, including delivery or birth complications, as shown by t-tests and X analyses ($p < .20$). Means and standard deviations for these variables are listed in Table 2.

Insert Tables 1 and 2

about here

Instruments

The Demographic Information Sheet is a self-administered form constructed in order to obtain general demographic information, such as, age, annual income, education, and marital status, as well as specific information regarding pre- and perinatal history, family composition and child-care experience (see Appendix B).

The Infant Characteristics Questionnaire (ICQ) is a brief parental report measure of infant temperament comprised of 24 items rated on seven-point scales, with the rating of 1 describing an optimal temperament trait and 7 a difficult temperament (Bates et al., 1979) (see Appendix

C). Items are based on the temperament dimensions suggested by Thomas and collegues (Thomas, Chess & Birch, 1968; Thomas, Chess, Birch & Hertzig, 1963), Prechtl's (1963) changeability and soothability factors and the fussiness and sociability dimensions proposed by Robson and Moss (1963). The ICQ was standardized on a sample of 322 (primarily middle class) mothers whose infants were between the ages of 4 and 6 months. Factor analyses indicated that the ICQ is comprised of four primary factors; Fussy-Difficult (degree of fussiness and difficulty to sooth), Unadaptable (reactions to new events, situations and people), Dull (social responsiveness and activity level) and Unpredictable (ease or difficulty in predicting infant's needs).

The internal consistency of the ICQ factors was checked on a cross-validation sample (N = 196), yielding alpha coefficients of .79 for Fussy-Difficult, .75 for Unadaptable, .50 for Unpredictable and .39 for Dull. Test-retest reliabilities were assessed at a mean interval of 30 days (N = 112), yielding the following pearson correlations for each factor, .70 Fussy- Difficult, .54 Unadaptable, .57 Dull and .47 Unpredictable. Only the Fussy - Difficult factor demonstrated moderate correlations with observer ICQ ratings and more objective observational data. Additional information regarding the reliability and validity of this instrument may be found in Hubert, Wachs, Peters-Martin and Gandour (1982).

The Child Abuse Potential Inventory (CAP) (Milner & Wimberley, 1979;1980) is a 160-item, self-administered inventory, which consists of the following seven factors; distress, rigidity, child with problems, problems from family and others, unhappiness, loneliness, and negative

concept of child and self (see Appendix D). The CAP also contains a lie scale, a random response scale and an inconsistency scale which are useful in estimating the validity of each subject's profile.

Split- half and KR-20 internal consistency measures for the CAP scale listed in the CAP Manual (Milner, 1986) reveal high internal consistency coefficients for both control (.92 - .96) and abuse (.95 - .98) groups. Temporal stability estimates for the CAP Abuse scale are also acceptable, with test-retest correlation coefficients ranging from .90 and .91, for one-day and one-week intervals, respectively, to .83 and .75, for one-month and three-month intervals, respectively. Investigations reviewed in the CAP Manual also support the construct (e.g., abuse scale scores reliably differentiated abusive mothers, non-abusive mothers who were abused during childhood and control mothers with no history of maltreatment, $p < .0001$; Caliso, 1986) and predictive validity (e.g., correctly classifying 92% of abusers and 100% of control parents; Milner & Wimberley, 1980) of the Abuse scale.

The Revised Parent Attribution Test (PAT) (Bugental & Shennum, 1984) is a brief, self-administered questionnaire on which subjects rate the perceived importance of several potential causes of caregiving outcomes along a 7 point scale continuum (see Appendix E). The PAT is comprised of four scales; perceived controllability of adult's contribution to caregiving success (ACS), perceived controllability of adult's contribution to caregiving failure (ACF), perceived controllability of child's contribution to caregiving success (CCS) and perceived controllability of child's contribution to caregiving failure (CCF). A composite score

for perceived balance of control over failure (PCF) has also been constructed (Bugental, Blue & Cruzcosa, 1989).

The Beck Depression Inventory (BDI) is a self-administered questionnaire consisting of 21 groups of four alternative statements, which indicate the extent of depression on a four-point scale ranging from not present to present to a mild, moderate, or severe degree (see Appendix F). Suggested cut-off points for determining the presence and severity of depression are provided.

Apparatus

For the instrumental pretreatment phase the apparatus was comprised of a button placed in a small wooden base. Two small lights were placed symmetrically on either side of the button, a green light labelled "you" and a red light labelled "automatic". In the escape condition, pressing the button 4 times during the inter-trial interval would terminate the cry and flash the green light labelled "you". In the inescapable condition, pushing the button would have no effect on terminating the cry (only the red light labelled "automatic" was flashed). Mothers in the control condition were not exposed to this instrumental task.

The solvable instrumental test task was a modified version of the shuttle box employed by Hiroto and Seligman (1975) and Donovan (1981). The escape response consisted of sliding a small wooden knob protruding from the top of the box, to alternating sides of the box for each successive trial. Subjects must move the knob directly to the opposite side of the box for their response to be correct. Sujects' responses were recorded on an IBM-PC that was interfaced with each apparatus (via the

analog to digital board). LabTech Notebook software package was programmed to monitor the number of correct responses, as well as response latency.

Stimulus Tapes

The stimulus tapes were constructed from a standardized test tape (Lounsbury & Bates, 1982) which contains hunger cries from a sample of 12 infants who were rated by their mothers as having an easy (N = 4), difficult (N = 4) or average (N = 4) temperament on the Fussy - Difficult dimension of the ICQ. Infants ranged between 3 to 5 months of age at time of recording. All cries were recorded in the infants' homes prior to a scheduled feeding. Spectral analysis of the cry stimuli indicated that the cries produced by the infants rated as difficult had higher fundamental frequencies at peak intensity, and longer pauses between cry bursts.

Two test tapes were constructed following the general procedures employed by Donovan (1981). Stimulus tape 1 was comprised of 32 10 - second cry segments; the four cries from the two temperament categories of easy and difficult, were each recorded 4 times in a random order. The inter-trial interval between cry segments ranged from 15 to 25 seconds, with a mean of 20 seconds. Stimulus tape 2 was comprised of 24 5 - second cry segments, with 4 cries from both the easy and difficult temperament categories each recorded 3 times in a random order. The inter-trial interval ranged between 30 and 45 seconds. The tapes were played on a Panasonic tape player at 80 db, and heard via headphones.

Procedure

All mothers who agreed to participate were mailed a letter briefly describing this project (Appendix A) along with the questionnaire measures listed above and a postage-paid return envelop. From this sample, 76 mothers agreed to come to Virginia Tech Child Development Center to participate in a project concerning maternal responsivity to infant cry sounds. Mothers were scheduled for an individual appointment at their convenience and childcare services were provided when needed. Upon arrival at the Child Development Center each mother was briefly informed that this study involved listening to a series of cries and was asked to sign a consent form for participation (Appendix G). Mothers from each temperament group were randomly assigned to one of three experimental conditions, escapable, inescapable and control, with the restriction that a relatively equal number of mothers with difficult / easy and male / female infants were assigned to each condition. Stimulus tape 1 was then played for all subjects. Subjects in the control condition were simply instructed that a series of cries would be played for which they should just sit and listen. Subjects assigned to the escapable and inescapable conditions were presented with the button press task and informed that:

From time to time an infant cry will come on for a brief period. When a cry comes on, there is something you can do with this box to stop it. It is your task to try to stop the cry.

The purpose of the two lights located on either side of the button was explained as follows:

Note the two lights located on either side of the button. The lights will tell you how the cry on each trial was terminated. If you find the

way to stop the cry, then the green light marked "you" will momentarily flash on after each time you stop the cry sound. If you do not stop the cry, then the red light labelled "automatic" will flash when the cry stops. Again, the green light indicates that you have stopped the cry and the red light indicates that the cry stopped automatically.

As a manipulation check, following completion of the pretreatment task subjects in the escape and inescape conditions were asked to estimate the number of trials for which they successfully terminated the cry sounds. All subjects in the inescape condition reported they did not stop the cry on any trials. For mothers in the escape condition, there was no difference between mothers who perceived their infants as easy and mothers who perceived their infants as difficult on their estimated number of successful trials ($t(24) = .83, p < .42$).

The instrumental test trials were completed in the same room as the pretreatment task, following a ten-minute rest period. All mothers were presented with the shuttle box task and provided with the following instructions:

Again you will hear a series of infant cry segments. Whenever you hear a cry come on there is something you can do with this box to stop it. It is your job to try to stop the cry sound.

When the mothers were ready to begin, stimulus tape 2 was played and each subject's responses during the 24 instrumental test trials were recorded via the IBM-PC. Following completion of the instrumental test all mothers were asked to estimate the number of trials for which they successfully terminated the cry stimulus. A sample of cries, produced by infants perceived as easy (N = 4) and difficult (N = 4) by their mothers, was then played for each subject. Mothers were provided a questionnaire

on which they were instructed to rate on a 7 point scale how similar or dissimilar each cry sounded to their own infant's cry (see Appendix H). Mothers were then asked to complete the BDI for a second time. All mothers were fully debriefed and paid $20 for their participation.

Dependent Measures

Following the same procedure as Donovan (1981), three behavioral response variables were selected to test for subjects' susceptibility to learned helplessness:

1) Mean number of failures to escape, defined as the number of trials containing the entire 5 - second cry.

2) Mean number of trials to escape criterion, defined as the number of trials passed prior to the completion of three consecutive escapes.

3) Mean response latency, defined as the time interval from stimulus onset to performing the correct response.

In addition, subjects' accuracy of control was calculated by subtracting subject's actual control (number of trials for which the cry stimulus was terminated) from their estimated control.

RESULTS

Behavioral Measures Indexing Learned Helplessness

The first analysis explored mothers' susceptibility to the effects of a learned helplessness task as a function of the perception of her own infant's temperament and pretreatment condition. Table 3 shows the means and standard deviations for these variables. A 2 (Temperament rating) by 3 (Pretreatment condition) multivariate analyses of variance (MANOVA) was conducted with (1) mean number of failures, (2) mean number of trials to criterion and (3) mean response latency as univariates. No main effect for pretreatment condition was found, $F(6,134) = .69$, $p < .69$. However, a significant temperament grouping by pretreatment interaction was found, $F(6,134) = 2.21$, $p < .046$. Univariate tests indicated that the two-way interaction was significant for number of failures, $F(2,69) = 4.83$, $p < .01$, and number of trials to criterion, $F(2,69) = 4.95$, $p < .01$, with a marginal effect for mean response latency, $F(2,69) = 2.31$, $p < .11$.

Insert Table 3

about here

Post-hoc comparisons were conducted using Student Newman Keuls with the harmonic mean of N to control for unequal cell sizes (see Appendix I). Results of these analyses showed that mothers of easy infants pre-

treated with inescapable crying demonstrated signficantly more failures ($p < .05$) and trials to criterion ($p < .05$) than mothers of easy infants in the escape and control pretreatment conditions. However, no reliable differences were found for mothers of difficult infants across all three pretreatment conditions. These findings indicate that mothers of easy infants demonstrated effects of learned helplessness, while mothers of difficult infants did not. In fact, mothers of difficult infants pretreated with inescapable crying demonstrated significantly fewer failures ($p < .05$), and trials to criterion ($p < .05$) than mothers of easy infants pretreated with inescapable crying.

When no prior experience terminating cry sounds was provided, mothers of difficult infants had marginally more failures and trials to criterion than mothers of easy infants. A similar pattern was shown by mothers in the escape condition, which also assesses mothers' performance prior to having experience on a similar task. Although not statistically significant, mothers of easy infants had fewer failures ($M = 9.93$, $SD = 9.43$) on the button press task than mothers of difficult infants ($M = 14.25$, $SD = 12.89$), $t(24) = -.98$, $p < .33$. Following procedures outlined by Lipsey (1990), the effect size was estimated at .40. The small sample ($N = 12$) used in this study was therefore insufficient to yield adequate statistical power. However, this pattern appears consistent with findings from Donovan and Leavitt (1988) which suggest that mothers of difficult infants tend to perform more poorly than mothers of easy infants when no prior experience terminating infant cry sounds is provided (control condition).

Efects of Cry Stimuli on Response Latency

To assess if mothers responded less effectively to the cries produced by difficult infants a 2 (Temperament rating) by 2 (Cry stimuli) repeated measures analysis of variance (ANOVA) was conducted on mean response latency. No significant findings were found for temperament group, $F(1,74) = .38$, $p < .54$, cry type, $F(1,74) = .34$, $p < .56$, or their interaction $F(1,74) = .17$, $p < .69$. Table 4 shows the means and standard deviations for this variable. These findings indicate that mothers did not respond less rapidly to cries produced by difficult infants than to cries produced by easy infants. In addition, regardless of the cry stimuli presented, mothers' who perceived their infants as difficult did not demonstrate a longer response latency than mothers who perceived their infants as easy.

Insert Table 4

about here

Perceptual Ratings of Cry Stimuli

To explore mothers' perceptual ratings of cry sounds produced by unfamiliar infants as a function of the perceived temperament of their infant, a 2 (Temperament rating) by 2 (Cry stimuli) repeated measures ANOVA was conducted on mothers' mean perceptual ratings. Higher numbers indicate more similarity. A significant main effect for cry stimuli was found, $F(1,74) = 5.42$, $p < .02$, with mothers rating the cries produced

by unfamiliar difficult infants as more similar to their own infants' cry sound (M = 4.41, SD = 1.17) than the cries produced by temperamentally easy infants (M = 4.06, SD = 1.25). A significant Temperament group by Cry stimuli interaction was not found, $F(1,74) = 2.19$, $p < .14$. Although ratings were in the predicted direction, mothers who perceived their infants as difficult did not reliably rate the cries produced by difficult infants as more similar to their own infant's cry (M = 4.49, SD = 1.17) than mothers of easy infants (M = 4.33, SD = 1.20).

Factors Moderating the Effects of Learned Helplessness

In order to assess the influence of additional factors on mothers' susceptibility to learned helplessness, stepwise multiple regression analyses were completed. This procedure allows for the identification of predictors that may appear "good" at an earlier stage but have lost their usefulness when additional predictors are brought into the equation, and allows for their removal (Pedhazur, 1982). For each of the experimental conditions (escape, inescape and control), each of the dependent variables (mean number of failures, mean number of trials to criterion and mean response latency) were independently regressed on the following predictors: potential for abuse (CAP score), perceptions of adult control over caregiving failure (ACF scale of the PAT), depression (BDI score) and perception of own infants' fussiness (fussy - difficult scale of the ICQ). In all, a total of 9 regression equations were completed. Due to the large number of analyses completed no factors were forced into the equations.

For mothers in the control condition, ratings of their infants' difficultness on the ICQ accounted for 23 % of the variance on mean number of failures, $F(1,19) = 5.82$, $p < .03$. No other factors significanlty added to this equation. These findings indicate that mothers' perceptions of their infants' temperament was associated with number of failures on the shuttle box task, when no prior experience terminating infant crying was provided. In contrast, approximately 63 % of the variance in mean response latency demonstrated by mothers in the pretreatment control condition was accounted for by their scores on the BDI, the ACF and the Abuse scale, with standardized regression coefficients of, .88, .47 and -.55, respectively, $F(3,17) = 9.47$, $p < .001$. Mothers' ratings of their infants' temperament did not signficantly add to this equation. These findings suggest that depression and perceptions of control over caregiving failure are positively associated with response latency, whereas potential for abuse is negatively associated with response latency. For mothers in the control condition, number of trials to criterion was not associated with any of the 4 proposed factors. A summary of the regression analyses on mean number of failures and mean response latency are listed in Table 5.

None of the above 4 factors were reliable predictors of number of failures, number of trials to criterion or response latency for mothers in the escape and inescape conditions. Therefore no further regression analyses were completed on these variables. The correlation coefficients produced by these analyses are listed in Table 6.

Insert Tables 5 and 6

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Self-Report Measures

To test the hypotheses that mothers who perceive their infants as difficult are more depressed, have a higher potential for abuse and espouse less control over caregiving outcomes than mothers of easy infants, t-tests for independent samples were completed on the BDI, CAP Abuse scale and all four scales comprising the PAT. Table 7 shows means, standard deviations and p-values for these variables. Mothers of easy and difficult infants did not signficantly differ on any of these measures ($p < .24$). In addition, a 2 (Temperament group) by 3 (Pretreatment condition) analysis of variance (ANOVA) on mothers' change in depression following completion of the shuttle box task found no effects for pretreatment condition, $F(2,73) = .572$, $p < .57$, temperament rating, $F(1,73) = .579$, $p < .45$, or their interaction $F(2,73) = 1.25$, $p < .29$. These results indicate that regardless of temperament group, mothers who were exposed to inescapable crying did not demonstrate greater depression.

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Perceptions of Control

To explore mothers' perceptions of control as a function of her own infant's temperament and pretreatment condition, a 2 (Temperament rating) by 3 (Pretreatment condition) ANOVA was completed on mothers' estimated number of trials correct minus their actual number of trials correct. No reliable effects for temperament group, $F(1,74) = .01$, $p < .99$, pretreatment condition, $F(2,74) = 1.51$, $p < .23$, or their interaction, $F(2,74) = .73$, $p < .48$ were found. In general, regardless of temperament grouping and/or pretreatment condition, mothers were fairly accurate in their estimations of control.

Effects of Infant Gender on Self-Report Measures

Analyses to explore mothers' scores on the ICQ, CAP, BDI and PAT as a function of their own infants' gender were also conducted. Means, standard deviations and p-values for these variables are displayed in Table 8. No reliable differences were found between mothers' ratings of male and female babies on any of the four factors comprising the ICQ (all p's $< .86$). In addition, no reliable differences between mothers of male and mothers of female infants were found on the BDI $t(74) = .55$, $p < .58$, or the 4 subscales of the PAT (all p's $< .46$). However, mothers of male infants obtained a significantly higher score on the Child Abuse Potential Inventory than mothers of female infants, $t(74) = 2.03$, $p < .05$. Although this may be a spurious finding associated with the large number of analyses conducted, this pattern suggests that mothers of male babies experience more stress than mothers of female babies, at least during the first 4 to 6 months of the infants' life. A 2 (Sex of infant) by 3

(Pretreatment condition) MANOVA was conducted with (1) mean number of failures, (2) mean number of trials to criterion, and (3) mean response latency as univariates. No significant effects for sex of infant, $F(3,67) = .99$, $p < .95$, pretreatment condition, $F(6,134) = .94$, $p < .66$ or their interaction, $F(6,134) = .97$, $p < .89$, were found. These findings indicate that although mothers of sons appeared to be more distressed, they were not less responsive to the infant cry sounds than mothers of daughters.

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Effects of Parity on Behavioral and Self-Report Measures

Similar analyses to explore the impact of parity on mothers' perceptions of their infants' temperament, as well as their reponsivity to the infant cry sounds were completed. Although primiparous mothers rated their infants as more difficult ($M = 18.54$, $SD = 5.47$) on the ICQ than multiparous mothers ($M = 16.75$, $SD = 6.45$), and received higher scores on the CAP ($M = 64.77$, $SD = 43.11$) than multiparous mothers ($M = 51.03$, $SD = 33.98$) these differences were not statistically significant (all p's $> .12$). First time mothers perceived themselves as having signficantly less control over caregiving success on the PAT ($M = 5.22$, $SD = .78$) than multiparious mothers ($M = 5.63$, $SD = .68$), $t(74) = -2.41$, $p < .02$. However, a 2 (Parity) by 3 (Pretreatment condition) MANOVA with

(1) mean number of failures, (2) mean number of trials to critereon, and (3) mean response latency as univariates, found no reliable effects for parity, $F(3,62) = .92$, $p < .43$, pretreatment condition, $F(6,124) = .80$, $p < .57$ or their interaction, $F(6,124) = .52$, $p < .79$.

Maternal Characteristics and Ratings of Infant Temperament

Two stepwise multiple regression analyses were completed to further explore if maternal characteristics and/or experiences influence mothers' ratings of their infants on the Fussy-Difficult dimension of the ICQ. In model one, social index, parity, maternal age, sex of infant and method of delivery (vaginal or cesarean) did not account for a significant portion of the variance on maternal ratings of their infants' temperamemt. Mothers' scores on the BDI, the CAP, and the PAT subscale assessing perceptions of adult control over caregiving failure also failed to significantly predict mothers' ratings of their infants temperament. However, similar stepwise multiple regression procedures indicated that 30 % of the variance in mothers' scores on the CAP (Adj R = .29) was accounted for by their scores on the BDI (B = .48) and mode of delivery (B = .23). No other variables, including social index, maternal age, sex of infant, parity and PAT scores signficantly added to the model.

DISCUSSION

Learned helplessness theory postulates that individuals who are exposed to uncontrollable events learn that their responding is futile, which subsequently impairs their motivation and ability to respond ef-

fectively in future situations (Seligman, 1975). Several studies concerning maternal responsivity to infant cry sounds support the utility of a learned helplessness model in understanding caregivers' differential responsivity to infant cues (e.g., Donovan & Leavitt, 1985). Work by Donovan (1981), for example, provides some support for the hypothesis that a mother's history of success in controlling crying episodes will reliably determine her attention to and her ability to terminate future crying. Several observational studies suggest that characteristics of the infant, such as a difficult temperament, are associated with less attentive and responsive caregiving (e.g., Crockenberg, 1981). This study utilized an analog caregiving task to explore the postulate that mothers who may be unable to sooth their crying infant due to a difficult temperament, are more susceptible to learned helplessness and would subsequently be less effective in controlling unfamiliar infant cry sounds.

The hypothesis that mothers who perceive their infants as difficult would demonstrate greater difficulty than mothers of easy infants in terminating cry sounds, regardless of pretreatment condition, was not supported. Although not statistically significant for the small sample studied, mothers of difficult infants demonstrated more failures and trials to criterion than mothers of easy infants when no prior experience terminating the cry sounds was provided. In addition, number of failures on the shuttle box task was signficantly correlated with mothers' ratings of their infants' fussiness for the pretreatment control condition. Specifically, higher ratings of one's own infant as difficult were associated with more failures on the shuttle box task. This finding suggests that

mothers who perceive their infants as difficult may have more difficulty problem-solving the correct strategy to stop infant crying than mothers who perceive their infants as easy when presented with a novel caregiving task. However, in contrast to mothers of easy infants, mothers of difficult infants did not demonstrate learned helplessness subsequent to having no control over infant crying. Indeed, when placed in the inescape condition mothers of difficult infants performed signficantly better than mothers of easy infants, demonstrating fewer failures and trials to learn the correct strategy.

Although these findings are inconsistent with data obtained by Donovan and Leavitt (1985), which suggested that mothers who perceived their infants as difficult were more susceptible to learned helplessness, this discrepancy may be attributed to a number of methodological differences between studies. In Donovan and Leavitt's study, mothers rated their infants temperament after participating in the learned helplessness experiment. Perhaps participation in the study or more specifically exposure to the pretreatment conditons, influenced how mothers subsequently perceived their infants. In addition, a different instrument, the Infant Temperament Questionnaire developed by Carey (1973), was used to assess infant temperament and mothers were divided into easy-difficult temperament groups based on a median split. Therefore, mothers' ratings of their infants' temperament may not be comparable between studies.

Irrespective of their own infants' temperament, mothers perceived the cries produced by difficult infants as more similar to their own infants' crying compared to the cries produced by easy infants. This con-

tradicts previous findings by Boukydis and Burgess (1982) that difficult infant cries were rated as significantly less similar than easy or average infant cries to the cries of one's own infant. In addition, these researchers found a significant correlation among multiparous parents between ratings of own infants' temperament and ratings of cries of unfamiliar difficult infants as similar to one's own infant. Although the same cry stimuli and measure of infant temperament were employed in both studies, Boukydis and Burgess presented both mothers and fathers with 12 infant cry sounds produced by an equal number of easy, difficult and average infants. Immediately after each cry, parents were instructed to rate the cry sound (e.g., soothing / arousing), their reaction to the cry (e.g., anger / care for), similarity to own infant's cry, and probable cause of crying. In contrast, mothers in this study only rated similarity to own infant's cry following continous exposure of over 50 trials to the same cry sounds, which they were instructed to stop. Thus, mothers participating in this study may have been more familiar with the various cry sounds, more aroused physiologically, and/or experiencing more frustration / fatigue when rating the cry sounds. Inconsistent findings may therefore be due to sex differences, as well as different cognitive and/or emotional sets among respondents. Perhaps by providing a different basis for comparison, for example, exposure to different cry sounds appears to alter how the cry sounds are perceived (e.g., Zeskind & Huntington, 1984).

Although characteristics of the cry sound itself have been shown to influence how adults perceive and respond to infant crying (e.g., Zeskind & Lester, 1978), no differences between mothers' response latency to the

cries of difficult and easy infants were found. Among the cry sounds used in this study, the cries produced by difficult infants had a higher fundamental frequency at peak intensity than the cries produced by easy infants (Lounsbury & Bates, 1982). In previous work, mean fundamental frequency best predicted how urgent, arousing, and distressing cries were perceived by multiparous mothers (Zeskind & Marshall, 1988). Specifically, mothers experienced more anger/irritation in response to the cries of difficult infants, which also elicited fewer soothing responses than the cries of easy infants (Boukydis & Burgess, 1982). However, cries with a higher fundamental frequency were also associated with more urgent and comforting caregiving responses in a naturalistic observation of professional caregivers (Zeskind & Collins, 1987). These inconsistent findings suggest that adults' responsivity to these hyperphonated cry sounds are mediated by characteristics of the listener (Zeskind, 1987). Failure to find differential responsivity to the cries produced by difficult and easy infants may therefore be due to the homogeneous sample employed in this study.

While infants may elicit certain caregiving responses, studies indicate that characteristics of adults, such as their beliefs regarding the causes of caregiving outcomes (e.g., Bugental & Cortez, 1988) and/or their demographic status, may act as a moderator between the behavior of the child and the behavior of the adult. Therefore, it is important to consider how the characteristics of the sample utilized in this study may have influenced their performance. Mothers employed in this study represented a financially well established and educated group. All but two

mothers were married, which suggests at least a minimal support system was available to most participants. Indeed, the presence of positive support in the form of an intimate spousal relationship during the first month following an infant's birth predicted positive affective responses between mother and infant several months later (Crnie, Ragozin, Robinson, & Basham, 1981).

In addition, mothers participating in this project appeared to be basically well adjusted, as indicated by their relatively low scores on the Beck Depression Inventory and the Child Abuse Potential Inventory. Mothers of difficult infants in this sample may therefore be more resilient to the effects of learned helplessness and better equipped to problem-solve alternative soothing strategies compared to mothers who are experiencing more stress and/or have less available support. Indeed, findings from this investigation suggest that mothers who experience more stress or depression may be more susceptible to learned helplessness. Specifically, higher scores on the Beck Depression Inventory were associated with a longer response latency for mothers in the control condition. Mothers who are depressed may be less motivated and/or adept at responding to their infants' cues. Previous work completed by Seligman and associates, for example, indicates that experience with inescapable noise and depression results in similar impairments on a solvable instrumental task (Klein & Seligman, 1976; Miller & Seligman, 1975).

In contrast, high scores on the Child Abuse Potential Inventory were associated with a shorter response latency on the shuttle box task. This suggests that mothers with a higher potential for abuse, as indexed by

their CAP score, will likely respond quickly to infant crying. Previous findings indicate that non-parent adults who score high on the CAP display higher physiologic arousal while listening to infant crying compared to their low scoring counterparts (Crowe & Zeskind, 1988). In addition, adults with a higher potential for abuse, as well as known child abusers, do not distinguish between various infant cues as indexed by their physiologic responses (Frodi & Lamb, 1980; Pruitt & Erickson, 1985). Adults with a higher potential for abuse appear to be more aroused, but less sensitive to infant crying. Together these findings suggest that adults with a higher potential for abuse may respond more quickly to infant cry sounds because of their greater arousal than adults with a low potential for child abuse. However, the more rapid responses of adults who score high on the CAP may not be sensitive to their infants' needs nor effectively sooth their infants' crying.

The hypotheses that mothers of difficult infants would be more depressed, espouse less control over caregiving outcomes and experience more parenting stress than mothers of easy infants were not supported. Although these findings may appear surprising when considering the different parenting experiences that infants with easy and difficult temperaments likely provide, again it is important to view these findings within the well functioning, homogeneous sample employed. The majority of mothers participating in this study were married, college educated and in the upper middle class of socioeconomic status, all factors which may have helped to buffer these mothers from developing dysfunctional responses to difficult parenting experiences.

Interestingly, mothers of sons experienced reliably more parenting stress, as indexed by their scores on the CAP, than mothers of daughters. Although male infants were not perceived by their mothers as reliably more difficult than female infants, previous work suggests male infants are perceived as more irritable and receive less maternal stimulation than female infants (e.g., Shonk & Frodi, 1988). Moss (1967) suggested that male babies may be less consolable and thereby provide less rewarding responses to their mothers' caretaking than female babies, resulting in less maternal responsivity to the distress signals of boys. However, no differences in terminating cry sounds were found between mothers of male and mothers of female infants in this study.

This study explored the influence of maternal perceptions of their own infants' temperament on susceptibility to learned helplessness. One prominant issue in temperament research concerns whether temperament reflects a constitutional characteristic of the individual (e.g., Buss & Plomin, 1975) or a social perception of the parent (e.g., Bates, 1982). Most findings suggest a very low correlation between parent and observer ratings of infant temperament (e.g., Hubert, Wachs, Peters-Martin & Gandour, 1982). Although mothers' ratings of their infants' temperament were not associated with demographic or psychological variables incorporated in this study, several studies found that mothers' ratings of their infants as difficult were best predicted by demographic and psychological characteristics of the caregiver (e.g., Bates et. al., 1979; Sameroff, Seifer & Elias, 1982). Because previous work suggests that adults' perception or interpretation of children's actions may be more influential

in determining adults' responses than specific child behaviors (e.g., Bugental & Cortez, 1988), objective measures of infant temperament were not obtained. Donovan and Leavitt (1985) provide additional support for the importance of mothers' attributions for unsuccessful experiences in mediating their susceptibility to learned helplessness.

Results from this investigation suggest two different processes may be occurring among mothers who perceive their infants as temperamentally easy and mothers who perceive their infants as difficult. Mothers' perceptions of their infants as increasingly difficult were significantly associated with more difficulty terminating infant crying when presented with a novel analog task. Through continuous interactions with a hard to console infant mothers of difficult infants may, for example, develop negative expectations regarding their caregiving skills and/or their infants' responsivity. This perception may subsequently interfere with their initial response to infant crying. In contrast, mothers of temperamentally easy infants would likely learn that their caretaking responses are frequently very affective and thereby feel more adept at soothing their infant.

However, mothers of easy infants, who typically do not experience difficulty soothing their infants, quickly learned that their responding was futile following exposure to uncontrollable infant crying. These mothers were subsequently less affective at stopping infant cry sounds than their counterparts in the escape and control conditions. Perhaps for mothers of easy infants, placement in the inescape pretreatment condition presented a novel failure experience which altered their cognitive

set and interfered with their development of effective caregiving strategies. For mothers of difficult infants, however, having no control over crying was likely not a new experience. Mothers of difficult infants may have learned to try many different soothing strategies when presented with continuous crying. The experience of having no success in terminating the infant cry sounds appears to have primed mothers of difficult infants to implement a wider array of strategies and thereby enhance their performance on the shuttle box task.

Several observational studies suggest that mothers of difficult infants are more engaged with their babies compared to mothers of less irritable infants (e.g., Fish & Crockenberg, 1981). Perhaps mothers of irritable or hard to console infants may learn to stimulate their infants in different ways, as well as spend longer periods of time with their infant because their initial interactional style may frequently be unsuccessful. For example, mothers of infants who cried more and took longer to calm at 1 and 3 months displayed more interaction with their infants at 9 months of age than did mothers of infants who were easier to console (Fish & Crockenburg, 1981). Interestingly, babies identified by their mothers as difficult were observed to receive more affection and object stimulaton by their mothers only for first born children and families with higher socioeconomic status (Bates et al., 1982). Again, the greater responsivity observed among mothers of difficult infants following exposure to uncontrollable crying may be associated with the well-functioning, homogeneous sample employed in this study. Future research should further explore socioeconomic and cultural factors that may medi-

ate caregivers' responsivity to infants with different temperamental styles.

Research concerning parental responsiveness to salient infant cues, such as crying, will continue to proliferate because of the importance of caregivers' responsivity to infants' social and cognitive development (e.g., Bell & Ainsworth, 1972). Findings from this investigation partially support the utility of a learned helplessness model to better understand how the interplay between infant and parental characteristics influence caregiver responsivity. However, a theorectical framework to account for the facilitation effects observed among some individuals following experience with uncontrollable events should be incorporated and empirically tested. Future investigations should also integrate naturalistic and laboratory approaches in order to explore the relation between children's behavior, parental attributions and parental responsivity to their children's cues.

REFERENCES

Abramson, L.Y., Seligman, M.E., & Teasdale, J.D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Ainsworth, M.D.S. (1967). Infancy in Uganda: Infant Care and Growth of Love. Baltimore: Johns Hopkins University Press.

Ainsworth, M.D.S. (1979). Attachment as related to mother-infant interaction. In J.S. Rosenblatt, R.A. Hinde, C. Beer, & M. Busnel (Eds.), Advances in the Study of Behavior (vol. 9). New York: Academic Press.

Ainsworth, M.D.S., Bell, S.M., & Stayton, D.J. (1971). Individual differences in strange situation behavior of one-year-olds. In H.R. Schaffer (Ed.), The Origins of Human Social Relations. New York: Academic Press.

Ainsworth, M.D.S., Blehar, M.C., Waters, E., & Wall, S. (1978). Patterns of Attachment. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Albert, M., & Geller, E.S. (1978). Perceived control as a mediator of learned helplessness. American Journal of Psychology, 94, 389-400.

Bakeman, R., & Brown, J.W. (1980). Early interaction: consequences for social and mental development at three years. Child Development, 57, 437-447.

Bates, J.E. (1980). The concept of difficult temperament. Merrill-Palmer Quarterly, 26, 299-319.

Bates, J.E., Freeland, C.A., & Lounsbury, M.L. (1979). Measurement of infant difficultness. Child Development, 50, 794-803.

Bates, J., Olsen, S., Pettit, G., & Bayles, K. (1982). Dimensions of individuality in the mother-infant relationship at six months of age. Child Development, 53, 446-461.

Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.

Bell, R.Q. (1971). Stimulus control of parent or caretaker behavior by offspring. Developmental Psychology, 4, 61-72.

Bell, S.M. & Ainsworth, M.D.S. (1972). Infant crying and maternal responsiveness. Child Development, 43, 1171-1190.

Belsky, J., Rovine, M., & Taylor, D.G. (1984). The Pennsylvania Infant and Family Development Project: 3. The origins of individual differences in the infant-mother attachment: Maternal-infant Contributions. Child Development, 55, 718-728.

Boukydis, C.F., & Burgess, R.L. (1982). Adult physiological response to infant cries: Effects of temperament of infant, parental status, and gender. Child Development, 53, 1291-1298.

Brazelton, T.B. (1984). Neonatal Behavioral Assessment Scale. Philadelphia: J.B. Lippincott Co.

Brody, S., & Axelrad. S. (1978). Mothers, Fathers, and Children. New York: International Universities Press.

Bugental, D.B., Blue, J. & Cruzcosa, M. (1989). Perceived control over caregiving outcomes: Implications for child abuse. Developmental Psychology,

Bugental, D.B., Caporael, L., & Shennum, W.A. (1980). Experimentally produced child uncontrollability: Effects on the communication of adults with different control perception. Child Development, 51, 520-528.

Bugental, D.B., & Cortez, V.L. (1988). Physiological reactivity to responsive and unresponsive children as moderated by perceived control. Child Development, 59, 686-693.

Bugental, D.B., & Shennum, W.A. (1984). "Difficult" children as elicitors and targets of adult communication pattterns: An attributional-behavioral transactional analysis. Monographs of the Society for Research in Child Development, 49.

Buss, D.M. & Plomin, R. (1984). Temperament: Early developing personality traits. Hillsdale, New Jersey: Erlbaum.

Caliso, J.A. (1986). A psycholgical study of mothers who do not physically abuse their children despite histories of physical abuse in their childhoods. Unpublished doctoral dissertation. Seton Hall University, South Orange, N.J.

Campbell, S.B. (1979). Mother-infant interaction as a function of maternal ratings of temperament. Child Psychiatry and Human Development, 10, 67-76.

Carey, W.B. (1970). A simplified method for measuring infant temperament. Journal of Pediatrics, 77, 188-194.

Carey, W.B., & McDevitt, S.C. (1979). Revision of the Infant Temperament Questionnaire. Pediatrics, 61, 735-739.

Caron, J., & Miller, P. (1981). The Effects of Infant Characteristics on Caretaker Responsiveness Among the Gusii. Paper presented at the Society for Research in Child Development. Bosten.

Cole, C.S., & Coyne, J.C. (1977). Situational specificity of laboratory induced learned helplessness. Journal of Abnormal Psychology, 86, 615-623.

Crittenden, P.M. (1981). Abusing, neglecting, problematic, and adequate dyads: Differentiating by patterns of interaction. Merrill-Palmer Quarterly, 27, 201-218.

Crnie, K., Ragozin, A., Robinson, N., & Basham, R. (1981). The effects of stress and social support on maternal attitudes and the mother-infant relationship. Paper presented at the meeting of the Society for Research in Child Development, Boston.

Crockenberg, S. (1981). Infant irritability, mother responsiveness, and social support influences on the security of infant-mother attachment. Child Development, 52, 857-865.

Crockenberg, S.B. (1986). Are temperamental differences in babies associated with predictable differences in care giving? In J.V. Lerner & R.M. Lerner (Eds.), Temperament and Social Interaction During Infancy and Childhood New Directions for Child Development, (pp. 53-73). San Fransisco: Jossey-Bass.

Crockenberg, S., & Acredolo, C. (1983). Infant temperament ratings: A function of infants, or mothers, or both? Infant Behavior and Development, 6, 61-72.

Crockenberg, S.B., & Smith, P. (1982). Antecedents of mother-infant interaction and infant irritability in the first three months of life. Infant Behavior and Development, 5, 105-119.

Crowe, H.P., & Zeskind, P.S. (1988). The Relation Between Scores on the Child Abuse Potential Inventory and Physiological Responses to Infant Cry Sounds. Paper presented at The Conference on Human Development, Charlotte, North Carolina.

DeCasper, A.J., & Carstens, A.A. (1981). Contingencies of stimulation: Effects on learning and emotion in neonates. Infant Behavior and Development, 4, 19-35.

Disbrow, M.A., Doer, H., & Caulfield, C. (1977). Measuring the components of parents' potential for child abuse and neglect. Child Abuse and Neglect, 1, 279-296.

Donate-Bartfield, E., & Passman, R.H. (1985). Attentiveness of mothers and fathers to their baby's cries. Infant Behavior and Development, 8, 385-393.

Donovan, W.L. (1981). Maternal learned helplessness and physiologic response to infant crying. Journal of Personality and Social Psychology, 40, 919-926.

Donovan, W.L., & Leavitt, L.A. (1978). Early cognitive development and its relation to maternal physiologic and behavioral response. Child Development, 49, 1251-1254.

Donovan, W.L., & Leavitt, L.A. (1985). Simulating conditions of learned helplessness: The effects of interventions and attributions. Child Development, 56, 594-603.

Donovan, W.L., & Leavitt, L.A. (1986). Maternal attributional style, physiologic response, infant temperament and father support as correlates of maternal illusion of control over infant crying. Paper presented at the International Conference on Infant Studies, Los Angeles.

Donovan, W.L., Leavitt, L.A., & Balling, J.D. (1978). Maternal physiologic response to infant signals. Psychophysiology, 15, 68-74.

Donovan, W.L., Leavitt, L.A., & Walsh, R.O. (1988). Susceptibility to learned helplessness in responding to infant cries. Paper presented International Conference on Infant Studies, Washington, D.C.

Dunn, J., & Kendrick, C. (1980). Studying temperament and parent-child interaction: Comparison of interview and direct observation. Developmental Medicine and Child Neurology, 22, 484-496.

Dweck, C.S., & Reppucci, N.D. (1973). Learned helplessness and reinforcement responsibility in children. Journal of Personality and Social Psychology, 25, 109-116.

Ellis, R.H., & Milner, J.S. (1981). Child abuse and locus of control. Psychological Reports, 48, 507-510.

Fish, M., & Crockenberg, S. (1981). Correlates and antecedents of nine-month infant behavior and mother-infant interaction. Infant Behavior and Development, 4, 69-81.

Frodi, A.M., & Lamb, M.E. (1978). Sex differences in responsiveness to infants: A developmental study of psychophysiological and behavioral responses. Child Development, 49, 1182-1188.

Frodi, A.M., & Lamb, M.E. (1980). Child abusers' responses to infant smiles and cries. Child Development, 51, 238-241.

Frodi, A.M., Lamb, M.E., Leavitt, L.A., & Donovan, W.L. (1978). Fathers' and mothers' responses to infant smiles and cries. Infant Behavior and Development, 1, 187-198.

Frodi, A.M, Lamb, M.E., Leavitt, L.A., Donovant, W.L., Neff, C., Neff, C., & Sherry, D. (1978). Fathers' and mothers' responses to the faces and cries of normal and premature infants. Developmental Psychology, 14, 490-498.

Fullard, W., McDevitt, S., & Carey, W. (1978). Unpublished Manuscript. Department of Educational Psychology, Temple University.

Geer, J., Davison, G.C., & Gatchel, R.J. (1970). Reduction of stress in humans through nonveridical perceived control of aversive stimulation. Journal of Personality and Social Psychology, 16, 731-738.

Gewirtz, J.L. (1977). Maternal responding and the conditioning of infant crying: Directions of influence within the attachment acquisition process. In B.C. Etzel, J.M. LeBlanc, & D.M. Baer (Eds.), New Developments in Behavioral Research: Theory, Method, and Application. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Glass, D.C., & Singer, J.E. (1972). Urban stress experiments on noise and social stressors. New York: Academic Press.

Goldsmith, H.H., Buss, A.H., Plomin, R., Rothbart, M.K., Thomas, A., Chess, S., Hinde, R.A., & McCall, R.B. (1987). Roundtable: What is temperament? Four approaches. Child Development,. 58, 505-529.

Graham, F.K., & Clifton, R.C. (1966). Heart rate change as a component of the orienting response. Psychological Bulletin, 65, 305-320.

Hiroto, D.S. (1974). Locus of control and learned helplessness. Journal of Experimental Psychology, 102, 187-193.

Hiroto, D.S., & Seligman, M.E.P. (1975). Generality of learned helplessness in man. Journal of Personality and Social Psychology, 28, 857-870.

Hollingshead, A.B. (1975). Four Factor Index of Social Status. Yale University, New Haven, Connecticut.

Hubert, N.C., Wachs, T.D., Peters-Martin, P., & Gandour, M.J. (1982). The study of early temperament: Measurement and conceptual issues. Child Development, 53, 571-600.

Isabella, R.A., Ward, J.J., & Belsky, J. (1985). Convergence of multiple sources of information on infant individuality: Neonatal behavior, infant behavior, and temperament reports. Infant Behavior and Development, 8, 283-291.

Kelly, P. (1976). The relation of infant's temperament and mother's psychopathology to interactions in early infancy. In K.F. Riegel & J.A. Meacham (Eds.), The Developing Individual in a Changing World. Chicago: Aldine.

Kevill, F. & Kirkland, J. (1981). Infant crying and learned helplessness.

Klein, P. (1984). The relation of Israeli mothers towards infants in relation to infants' perceived as difficult. Child Development, 55, 1212-1218.

Klein, D.C., & Seligman, M.E.P. (1976). Reversal of performance deficits and perceptual deficits in learned helplessness and depression. Journal of Abnormal Psychology, 85, 11-26.

Korner, A.F. (1974). The effect of the infant's state, level of arousal, sex, and onotogenetic stage on the caregiver. In Lewis & Rosenblum (Eds), The effect of the infant on its caregiver. New York: Wiley.

Korner, A.F., Chuck, B., & Dontchos, S. (1968). Organismic determinants of spontaneous oral behavior in neonates. Child Development, 39, 1145-1157.

Korner, A.F., & Thoman, E.B. (1972). The relative efficacy of contact and vestibular-proprioceptive stimulation in soothing neonates. Child Development, 43, 443-453.

Kropp, J.P., & Haynes, O.M. (1987). Abusive and nonabusive mothers' ability to identify general and specific emotion signals of infants. Child Development, 58, 187-190.

Lacey, J. (1967). Somatic response patterning and stress: Some revisions of activation theory. In M. Appley & R. Trumbell (Eds.), Psychological Stress: Issues in Research. New York: Appleton-Century Crofts.

Lamb, M.E. (1981). The development of social expectations in the first year of life. In M.E. Lamb & L.R. Sherrod (Eds.), Infant Social Cognition: Empirical and Theoretical Considerations. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Lamb, M.E., & Easterbrooks, M.A. (1981). Individual differences in parental sensitivity: Origins, components and consequences. In M.E. Lamb & L.R. Sherrod (Eds.), Infant Social Cognition: Empirical and Theoretical Considerations. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Leavitt, L.A., & Donovan, W.L. (1979). Perceived infant temperament, locus of control, and maternal physiological response to infant gaze. Journal of Research in Personality, 13, 267-278.

Lee, C., & Bates, J. (1985). Mother-child interaction at age two years and perceived difficult temperament. Child Development, 56, 1314-1325.

Lewis, M. & Coates, D.L. (1980). Mother-infant interaction and cognitive development in twelve-week old infants. Infant Behavior and Development, 3, 95-105.

Lewis, M., & Goldberg, S. (1969). Perceptual cognitive development in infancy: A generalized expectancy model as a function of mother- infant interactions. Merrill-Palmer Quarterly 15, 81-100.

Linn, P., & Horowitz, F. (1983). The relationship between infant individual differences and mother-infant interaction during the neonatal period. Infant Behavior and Development, 6, 415-427.

Lipsey, M.W. (1990). Design sensitivity: Statistical power for experimental research. Sage Publications: Newbury Park.

Lounsbury, M.L., & Bates, J.E. (1982). The cries of infants of differing levels of perceived temperamental difficultness: Acoustic properties and effects on listeners. Child Development, 53, 677-686.

Mebert, C.J., & Kalinowski, M.F. (1984). The role of pregnancy and birth-related variables in parents' perceptions of infant temperament and transition to parenthood. Manuscript based on papers presented at the International Conference of Infant Studies.

Miller, W.R., & Seligman, M.E.P. (1975). Depression and learned helplessness in man. Journal of Abnormal Psychology, 8, 228-238.

Milliones, J. (1978). Relationship between perceived child temperament and maternal behaviors. Child Development, 49, 1255-1257.

Milner, J.S. (1980). The Child Abuse Potential Inventory Manual (2nd Ed.). Webster, North Carolina: PSYTEC INC.

Milner, J.S., Gold, R.G., Ayoub, C., & Jacewitz, M.M. (1984). Predictive validity of the Child Abuse Potential Inventory. Journal of Consulting and Clinical Psychology, 52, 879-884.

Milner, J.S., & Wimberley, R.C. (1979). An inventory for the identification of child abusers. Journal of Clinical Psychology, 35, 95-100.

Milner, J.S., & Wimberley, R.C. (1980). Prediction and explaination of child abuse. Journal of Clinical Psychology, 36, 875-884.

Moss, H.A. (1967). Sex, age, and state as determinants of mother-infant interaction. Merrill-Palmer Quarterly, 13, 19-36.

Osofsky, J.D. (1976). Neonatal characteristics and mother-infant interaction in two observational situations. Child Development, 47, 1138-1147.

Peters-Martin, P., & Wachs, T. (1984). A longitudinal study of temperament and its correlates in the first twelve months. Infant Behavior and Development, 7, 285-298.

Pettit, & Bates, J. (1984). Continuity of individual differences in the mother-infant relationship from six to thirteen months. Child Development, 55, 729-739.

Pittman, N.L., & Pittman, T.S. (1979). Effects of amount of helplessness training and internal-external locus of control on mood and performance. Journal of Personality and Social Psychology, 37, 39-47.

Pruitt, D.L., & Erickson, M.T. (1985). the Child Abuse Potential Inventory: A study of concurrent validity. Journal of Clinical Psychology, 41, 104-110.

Robson, K.S., & Moss, H.A. (1970). Patterns and determinants of maternal attachment. Journal of Child Psychology and Psychiatry, 8, 13-25.

Rothbart, M. (1981). Measurement of temperament in infancy. Child Development, 52, 569-587.

Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80.

Sameroff, A.J., & Chandler, M.J. (1975). Reproductive risk and the continuum of caretaking casualty. In F.D. Horowitz (Ed.), review of child development research (Vol. 4). Chicago: University of Chicago Press.

Sameroff, A.J., Seifer, R., & Elias, P.K. (1982). Sociocultural variability in infant temperament ratings. Child Development, 53, 164-173.

Sander, L.W., Stechler, G., Burns, P., & Lee, A. (1979). Change in infant and caregiver variables over the first two months of life: Integration of action in early development. In E.B. Thoman (Ed.), Origins of the Infant's Social Responsiveness. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Seligman, M.E.P. (1975). Helplessness: on depression, development and depression. San Francisco: Freeman.

Shonk, S.M., & Frodi, A. (1988). The role of infant gender in maternal attributions of crying and in mother-infant interaction. Poster

presented at the International Conference on Infant Studies, Washington, D.C.

Skinner, E.A. (1985). Determinants of mother sensitive and contingent-responsive behavior: The role of childrearing beliefs and socioeconomic status. In E. Sigel (Ed.), Parental Belief Systems: The Psychological Consequences for Children. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Smith, P.B., & Pederson, D.R. (1987). Maternal sensitivity and patterns of infant-mother attachment. Child Development, 59, 1097-1101.

Sroufe, L.A. (1977). The coherence of individual development: Early care attachment and subsequent developmental issues. American Psychologist, 34, 834-841.

Stevens, J. (1986). Applied Multivariate Statistics for the Social Sciences. New York.

Thomas, A., & Chess, S. (1977). Temperament and Development. New York: Brunner/Mazel.

Thomas, A., Chess, S., & Birch, H.G. (1968). Temperament and Behavior Disorders in Children. New York: New York University Press.

Thomas, A., Chess, S., Birch, H.G., Hertzig, M., & Korn, S. (1963). Behavioral individuality in early childhood. London: University of London Press.

Thomas, A., Chess, S., & Korn, S.J. (1982). The reality of difficult temperament. Merrill-Palmer Quarterly, 28, 1-20.

Vaughn, B.E., Deinard, A., & Egeland, B. (1980). Measuring temperament in pediatric practice. Journal of Pediatrics, 96, 510-518.

Vaughn, B.E., Bradley, C.F., Joffe, L.S., Seifer, R., & Barglow, P. (1987) Maternal characteristics measured prenatally are predictive of ratings of tempermantal "difficulty" on the Carey Infant Tempermant Questionnaire. Developmental Psychology, 23, 152-161.

Watson, J.S., & Ramey, C.T. (1972). Reactions to response-contingent stimulation in early infancy. Merrill-Palmer Quarterly, 18, 219-227.

Zeskind, P.S. (1987). Adult heart-rate responses to infant cry sounds. British Journal of Developmental Psychology, 5, 73-79.

Zeskind, P.S., Collins, V. (1988). Pitch of infant crying and caregiver responses in a natural setting. Infant Behavior and Development, 10, 501-504.

Zeskind, P.S., & Huntington, L. (1984). The effects of within group and between group methodologies in the study of perceptions of infant crying. Child Development, 55, 1658-1665.

Zeskind, P.S., & Lester, B.M. (1978). Acoustic features and auditory perceptions of the cries of newborns with prenatal and perinatal complications. Child Development, 49, 580-589.

Zeskind, P.S., & Lester, B.M. (1981). Analysis of cry features in newborns with differential fetal growth. Child Development, 52, 207-212.

Zeskind, P.S., & Marshall, T.R. (1988). The relation between variations in pitch and maternal perceptions of infant crying. Child Development,

TABLES

Table 1: Means and Standard Deviations for Factors Comprising the ICQ by Temperament Grouping

Factor	Temperament Grouping: Easy (N = 40)	Temperament Grouping: Difficult (N = 36)	p Value
Fussy - Difficult	12.44 (2.72)	23.42 (3.80)	.0001
Unadaptable	7.76 (3.38)	11.18 (3.97)	.0001
Dull	7.97 (2.59)	7.68 (2.65)	.632
Unpredictable	6.71 (2.61)	8.94 (2.67)	.0001
Total Score	34.89 (6.84)	51.24 (8.58)	.0001

note: Data in parentheses denote standard deviations

Table 2: Means and Standard Deviations for Demographic Variables by Temperament Grouping

Variables	Temperament Grouping: Easy (N = 40)	Temperament Grouping: Difficult (N = 36)	p Value
Maternal Age	28.95 (4.26)	27.65 (4.92)	.236
Number of Children	1.97 (1.34)	1.60 (.95)	.182
Age of Infant	4.59 (.80)	4.61 (.79)	.928
Social Index	50.11 (9.80)	51.40 (14.12)	.656
Vaginal Delivery	27.00 *(75 %)	28.00 *(80 %)	.83
Birth Complications (Less than 2)	21.00 *(58 %)	25.00 *(69 %)	.29

note: Data in parentheses denote standard deviations
*( ) denotes percentages of sample

Table 3: Means and Standard Deviations for Temperament Group by Pretreatment MANOVA on Behavioral Measures

	Temperament Group					
	EASY			DIFFICULT		
Pretreatment Condition	Escape	Inescape	Control	Escape	Inescape	Control
VARIABLE						
Number of Failures	7.79 (5.99)	14.58 (7.56)	8.21 (4.04)	9.33 (5.47)	7.64 (5.92)	12.00 (8.26)
Trials to Criterion	8.93 (6.94)	16.50 (9.63)	8.00 (4.29)	8.75 (6.96)	6.18 (7.31)	11.50 (10.97)
Response Latency	2.38 (.55)	3.05 (1.39)	2.71 (.61)	2.46 (.65)	2.23 (.53)	2.83 (1.04)

note: Data in parentheses denote standard deviations

Table 4: Means and Standard Deviations for Mean Response Latency by Temperament Grouping and Cry Stimuli

Cry Stimuli	Temperament Grouping: Easy (N = 40)	Temperament Grouping: Difficult (N = 36)
Cry Sounds of Difficult Infants	1.53 (.84)	1.44 (.88)
Cry Sounds of Easy Infants	1.52 (.83)	1.38 (.83)

note: Data in parentheses denote standard deviations

Table 5: Regression Analyses on Number of Failures and Response Latency for the Pretreatment Control Condition

Criterion	Source	df	SS	F	p	R Square	Adj R
Number of Failures	Fuss	1	213.4	5.82	.03	.23	.19
Response Latency	Beck	1	4.5	8.33	.01	.30	.27
	ACF	2	7.32	8.63	.001	.49	.43
	Abuse	3	9.36	9.47	.001	.63	.56

Table 6: Correlation Coefficients for Behavioral and Self-Report Measures for Escape and Inescape Conditions

Pretreament Condition	Variables			
Escape	Fuss	Abuse	ACF	Beck
Number of Failures	.095	.066	-.222	-.081
Trials to Criterion	-.070	-.013	-.079	-.108
Response Latency	.072	-.118	-.188	-.136
Inescape				
Number of Failures	-.300	-.348	.122	-.198
Trials to Criterion	-.417	-.339	.180	-.188
Response Latency	-.404	-.213	.130	-.176

Table 7: Means and Standard Deviations for Questionnaire Data by Temperament Grouping

Factor	Temperament Grouping: Easy (N = 40)	Temperament Grouping: Difficult (N = 36)	p Value
Beck Depression Inventory	5.50 (6.97)	7.07 (4.71)	.25
Abuse Scale (CAP)	51.66 (33.45)	63.50 (49.05)	.22
PAT Subscales:			
Adult Control Success	5.43 (.81)	5.37 (.69)	.75
Adult Control Failure	4.11 (.51)	3.97 (.52)	.24
Child Control Success	4.05 (.56)	3.92 (.49)	.29
Child Control Failure	4.23 (.49)	4.27 (.60)	.72

note: Data in parentheses denote standard deviations

Table 8: Means and Standard Deviations for Questionnaire Data by Sex of Infant

Factor	Sex of Infant: Male (N = 40)	Female (N = 36)	p Value
Fussy - Difficult	18.50 (7.24)	17.31 (5.41)	.42
Unadaptable	9.14 (3.89)	9.81 (3.97)	.44
Dull	7.84 (2.59)	7.62 (2.68)	.71
Unpredictable	8.19 (3.21)	7.62 (2.36)	.36
Total Score	43.63 (12.56)	42.36 (8.90)	.59
Beck Depression Inventory	6.49 (4.20)	5.98 (7.07)	.69
Abuse Scale (CAP)	66.70 (42.24)	47.44 (40.16)	.05
PAT Subscales:			
Adult Control Success	5.46 (.74)	5.35 (.78)	.55
Adult Control Failure	4.03 (.51)	4.07 (.53)	.68
Child Control Success	4.04 (.56)	3.95 (.51)	.46
Child Control Failure	4.22 (.63)	4.28 (.44)	.64

note: Data in parentheses denote standard deviations

APPENDIX A.

Dear Parent:

Thank you for agreeing to participate in our project concerning mothers' reactions to infant crying. As previously discussed your participation involves completing the enclosed questionnaires which may be returned in the envelope provided. Please note that your name is not required on any of the enclosed papers as you have been given an identification number. This will allow for confidentiality of your responses. Please read each questionnaire carefully before responding.

Once I receive your responses I will be contacting some mothers to schedule an appointment at the Child Study Center. At this time I will ask you to listen to a series of prerecorded infant cry sounds while you perform some tasks. Naturally, we will schedule this appointment at a time that is convenient for you. At the completion of this phase of the project you will receive $20.00 for your participation.

In addition, we would gladly provide child care for your infant during your participation. The Child Study Center is equipped with a complete nursery which is staffed by Child Care Specialists. While caring for your infant we would simply like to observe how your infant interacts with the Child Care Specialists and/or yourself. For example, we would watch how your baby responds to different sights and sounds such as bells and rattles, as well as how your baby reaches and grasps for toys. You can look in on your infant through an observation window at any time. This would not require any additional time on your part and would help us to better understand early behavioral differences among infants. If your child does come to the Child Study Center -- bringing the following items would be helpful; extra diapers, a small blanket, a favorite toy, and a bottle in case your infant becomes hungry.

If you have any questions regarding this project please do not hesitate to contact me. I will also be in touch in order to schedule your appointment at the Child Study Center. Thank you again, your participation is greatly appreciated.

Sincerely,

Helen P. Crowe, M.S. 231-6914

APPENDIX B.

Family Information Sheet

I.D.# _____

Age: _____

Occupation: _____ Husbands' Occupation: _____

Education: _____ Husbands' Education: _____

Estimated Family Income: _____

Race: White Black Hispanic American Indian Other

Marital Status: Married Divorced Separated Single Living Together

Please list the sex and age of your children:

Sex	Present Age
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

For your most recent pregnancy please note the following:

Method of Delivery: Vaginal Cesarean

Do you currently: Bottle-feed Breast-feed

Do you feed: On-Demand On-Schedule

List any complications experienced throughout pregnancy or delivery:

_____

_____

_____

_____

APPENDIX C.

Infant Questionnaire

Part I.

Your baby's name _____ Your name _____

Your baby's birthdate _____ Address _____

Your baby's sex _____

Birth weight _____ Phone # _____

Lenght at birth _____ Today's date _____

Present weight _____

****

Part II. On the following questions please circle the number that is most typical of your baby. "About average" means how you think the typical baby would be scored.

1. How easy or difficult is it for you to calm or soothe your baby when he/she is upset?

1	2	3	4	5	6	7
very easy			about average			difficult

2. How easy or difficult is it for you to predict when your baby will go to sleep and wake up?

1	2	3	4	5	6	7
very easy			about average			difficult

3. How easy or difficult is it for you to predict when your baby will become hungry?

1	2	3	4	5	6	7
very easy			about average			difficult

4. How easy or difficult is it for you to know what's bothering your baby when he/she cries or fuses?

1	2	3	4	5	6	7
very easy			about average			difficult

5. How many times per day, on the average, does your baby get fussy and irritable--for either short or long periods of time?

1	2	3	4	5	6	7
never	1-2 times per day	3-4 times per day	5-6 times per day	7-8 times per day	10-14 times per day	more than 15

6. How much does your baby cry and fuss in general?

1	2	3	4	5	6	7
very little: much less than the average baby			average amount: about as much as the average baby			alot: much more than the average baby

7. How did your baby respond to his/her first bath?

1	2	3	4	5	6	7
very well baby loved it			neither liked nor disliked it			terribly- didn't like it

8. How did your baby respond to his/her first solid food?

1	2	3	4	5	6	7
very favorably liked it immediately			neither liked nor disliked it			very negatively did not like it

9. How does your baby typically respond to a new person?

1	2	3	4	5	6	7
almost always responds positively			responds favorably about half the time			almost always responds negatively at first

10. How does your baby typically respond to being in a new place?

1	2	3	4	5	6	7
almost always responds positively			responds favorably about half the time			almost always responds negatively at first

11. How well does your baby adapt to things (such as items 7-10) eventually?

1	2	3	4	5	6	7
very well always likes it eventually			ends up liking it about half the time			almost always dislikes it in the end

12. How easily does your infant get upset?

1	2	3	4	5	6	7
very hard to upset-even by things that upset most babies			about average			very easily upset by things that wouldn't bother most babies

13. When your baby gets upset (e.g., before feeding, during diapering, etc.), how vigorously or loudly does he/she cry and fuss?

1	2	3	4	5	6	7
very mild intensity or loudness			moderate intensity or loudness			very loud or intense, cuts loose

14. How does your baby react when you are dressing him/her?

1	2	3	4	5	6	7
very well likes it			about average doesn't mind it			doesn't like it at all

15. How active is your baby in general?

1	2	3	4	5	6	7
very calm and quiet			average			very active and vigorous

16. How much does your baby smile and make happy sounds?

1	2	3	4	5	6	7
a great deal much more than most infants			an average amount			very little much less than most infants

17. What kind of mood is your baby genrally in?

1	2	3	4	5	6	7
very happy and cheerful			neither serious nor cheerful			serious

18. How much does your baby enjoy playing little games with you?

1	2	3	4	5	6	7
a great deal really loves it			about average			very little doesn't like it very much

19. How much does your baby want to be held?

1	2	3	4	5	6	7
wants to be free most of the time		sometimes wants to be held; sometimes not				a great deal-- wants to be held almost all the time

20. How does your baby respond to disruptions and changes in the everyday routine, such as when you go to church or a meeting, on trips, etc.?

1	2	3	4	5	6	7
very favorably doesn't get upset			about average			very unfavorably gets quite upset

21. How easy is it for you to predict when your baby will need a a diaper change?

1	2	3	4	5	6	7
very easy			about average			very difficult

22. How changeable is your baby's mood?

1	2	3	4	5	6	7
changes seldom and changes slowly			about average			changes often and rapidly

23. How excited does your baby become when people play with or talk to him/her?

1	2	3	4	5	6	7
very excited			about average			not at all

24. Please rate the overall degree of difficulty your baby would present to the average mother.

1	2	3	4	5	6	7
super easy			ordinary, some problems			high difficulty to deal with

APPENDIX D.

Instructions: The following questionnaire includes a series of statements which may be applied to yourself. Read each of the statements and determine if you AGREE or DISAGREE with the statement. If you agree with a statement, circle A for agree. If you disagree with a statement, circle DA for disagree. Be honest when giving your answers. Remember to read each statement; it is important not to skip any statement.

	AGREE	DISAGREE
1. I never feel sorry for others.	A	DA
2. I enjoy having pets.	A	DA
3. I have always been strong and healthy.	A	DA
4. I like most people.	A	DA
5. I am a confused person.	A	DA
6. I do not trust most people.	A	DA
7. People expect too much from me.	A	DA
8. Children should never be bad.	A	DA
9. I am often mixed up.	A	DA
10. Spanking that only bruises a child is o.k.	A	DA
11. I always try to check on my child when it is crying.	A	DA
12. I sometimes act without thinking.	A	DA
13. You cannot depend on others.	A	DA
14. I am a happy person.	A	DA
15. I like to do things with my family.	A	DA
16. Teenage girls need to be protected.	A	DA
17. I am often angry inside.	A	DA
18. Sometimes I feel all alone in the world.	A	DA
19. Everything in a home should always be in its place.	A	DA
20. I sometimes worry that I cannot meet the needs of a child.	A	DA
21. Knives are dangerous for children.	A	DA
22. I often feel rejected.	A	DA
23. I am often lonely inside.	A	DA
24. Little boys should never learn sissy games.	A	DA
25. I often feel very frustrated.	A	DA

26. Children should never disobey.	A	DA
27. I love all children.	A	DA
28. Sometimes I fear that I will lose control of myself.	A	DA
29. I sometimes wish that my father would have loved me more.	A	DA
30. I have a child who is clumsy.	A	DA
31. I know what is the right and the wrong way to act.	A	DA
32. My telephone number is unlisted.	A	DA
33. The birth of a child will usually cause problems in a marriage.	A	DA
34. I am always a good person.	A	DA
35. I never worry about my health.	A	DA
36. I sometimes worry that I will not have enough to eat.	A	DA
37. I have never wanted to hurt someone else.	A	DA
38. I am an unlucky person.	A	DA
39. I am usually a quiet person.	A	DA
40. Children are pests.	A	DA
41. Things have usually gone against me in life.	A	DA
42. Picking up a baby whenever he cries spoils him.	A	DA
43. I sometimes am very quiet.	A	DA
44. I sometimes lose my temper.	A	DA
45. I have a child who is bad.	A	DA
46. I sometimes think of myself first.	A	DA
47. I sometimes feel worthless.	A	DA
48. My parents did not really care about me.	A	DA
49. I am sometimes very sad.	A	DA
50. Children are really little adults.	A	DA
51. I have a child who breaks things.	A	DA
52. I often feel worried.	A	DA
53. It is O.K. to let a child stay in dirty diapers for a while.	A	DA
54. A child should never talk back.	A	DA
55. Sometimes my behavior is childish.	A	DA
56. I am often easily upset.	A	DA
57. Sometimes I have bad thoughts.	A	DA
58. Everyone must think of himself first.	A	DA
59. A crying child will never be happy.	A	DA
60. I have never hated another person.	A	DA

61. Children should not learn how to swim.	A	DA
62. I always do what is right.	A	DA
63. I am often worried inside.	A	DA
64. I have a child who is sick a lot.	A	DA
65. Sometimes I do not like the way I act.	A	DA
66. I sometimes fail to keep all my promises.	A	DA
67. People have caused me a lot of pain.	A	DA
68. Children should stay clean.	A	DA
69. I have a child who gets into trouble a lot.	A	DA
70. I never get mad at others.	A	DA
71. I always get along with others.	A	DA
72. I often think about what I have to do.	A	DA
73. I find it hard to relax.	A	DA
74. These days a person doesn't know on whom one can count.	A	DA
75. My life is happy.	A	DA
76. I have a physical handicap.	A	DA
77. Children should have play clothes and good clothes.	A	DA
78. Other people do not understand how I feel.	A	DA
79. A five year old who wets his bed is bad.	A	DA
80. Children should be quiet and listen.	A	DA
8A. I have several close friends in my neighborhood.	A	DA
82. The school is primarily responsible for educating the child.	A	DA
83. My family fights a lot.	A	DA
84. I have headaches.	A	DA
85. As a child I was abused.	A	DA
86. Spanking is the best punishment.	A	DA
87. I do not like to be touched by others.	A	DA
88. People who ask for help are weak.	A	DA
89. Children should be washed before bed.	A	DA
90. I do not laugh very much.	A	DA
91. I have several close friends.	A	DA
92. People should take care of their own needs.	A	DA
93. I have fears no one knows about.	A	DA
94. My family has problems getting along.	A	DA
95. Life often seem useless to me.	A	DA
96. A child should be potty trained by the time he is one year old.	A	DA
97. A child in a mud puddle is a happy sight.	A	DA
98. People do not understand me.	A	DA

99. I often feel worthless.	A	DA
100. Other people have made my life unhappy.	A	DA
101. I am always a kind person.	A	DA
102. Sometimes I do not know why I act as I do.	A	DA
103. I have many personal problems.	A	DA
104. I have a child who often hurts himself.	A	DA
105. I often feel very upset.	A	DA
106. People sometimes take advantage of me.	A	DA
107. My life is good.	A	DA
108. A home should be spotless.	A	DA
109. I am easily upset by my problems.	A	DA
110. I never listen to gossip.	A	DA
111. My parents did not understand me.	A	DA
112. Many things in my life make me angry.	A	DA
113. My child has special problems.	A	DA
114. I do not like most children.	A	DA
115. Children should be seen and not heard.	A	DA
116. Most children are alike.	A	DA
117. It is important for children to read.	A	DA
118. I am often depressed.	A	DA
119. Children should occasionally be thoughtful of their parents.	A	DA
120. I am often upset.	A	DA
121. People don't get along with me.	A	DA
122. A good child keeps his toys and clothes neat and orderly.	A	DA
123. Children should always make their parents happy.	A	DA
124. It is natural for a child to sometimes talk back.	A	DA
125. I am never unfair to others.	A	DA
126. Occasionally, I enjoy not having to take care of my child.	A	DA
127. Children should always be neat.	A	DA
128. I have a child who is slow.	A	DA
129. A parent must use punishment if he wants to control a child's behavior.	A	DA
130. Children should never cause trouble.	A	DA
131. I usually punish my child when it is crying.	A	DA
132. A child needs very strict rules.	A	DA
133. Children should never go against their		

	parents' orders.	A	DA
134.	I often feel better than others.	A	DA
135.	Children sometimes get on my nerves.	A	DA
136.	As a child I was often afraid.	A	DA
137.	Children should always be quiet and polite.	A	DA
138.	I am often upset and do not know why.	A	DA
139.	My daily work upsets me.	A	DA
140.	I sometimes fear that my children will not love me.	A	DA
141.	I have a good sex life.	A	DA
142.	I have read articles and books on child rearing.	A	DA
143.	I often feel very alone.	A	DA
144.	People should not show anger.	A	DA
145.	I often feel alone.	A	DA
146.	I sometimes say bad words.	A	DA
147.	Right now, I am deeply in love.	A	DA
148.	My family has many problems.	A	DA
149.	I never do anything that is bad for my health.	A	DA
150.	I am always happy with what I have.	A	DA
151.	Other people have made my life hard.	A	DA
152.	I laugh some almost every day.	A	DA
153.	I sometimes worry that my needs will not be met.	A	DA
154.	I often feel afraid.	A	DA
155.	I sometimes act silly.	A	DA
156.	A person should keep his business to himself.	A	DA
157.	I never raise my voice in anger.	A	DA
158.	As a child I was knocked around by my parents.	A	DA
159.	I sometimes think of myself before others.	A	DA
160.	I always tell the truth.	A	DA

APPENDIX E.

Revised Parent Attribution Test

In this questionnaire, we want to know how important you believe different factors might be as potential causes of successful and unsuccessful interactions with children. We are interested in discovering the way people think about children- there are no right or wrong answers.

Example: If you were teaching a child an outdoor game and he or she caught on very quickly, how important do you believe these possible causes would be?

	Not at all Important	Very Important
a) How good he or she is in sports in general	/____/____/____/____/____/____/____/ (place a check between lines like this)	
b) How good a teacher you are.	/____/____/____/____/____/____/____/	
c) How easy the game is.	/____/____/____/____/____/____/____/	

Answer the following questions by making ratings in the same way as shown above.

1. Suppose you took care of a neighbor's child one afternoon, and the two of you had a really good time together. How important do you believe the following factors would be as reasons for such an experience?

	Not at all Important	Very Important
a) Whether or not this was a "good day" for the child, e.g., whether there was a TV show the child wanted to see (or some other special thing to do).	/____/____/____/____/____/____/____/	
b) How interested you were in being with the child that day.	/____/____/____/____/____/____/____/	
c) How well you get along with children in general.	/____/____/____/____/____/____/____/	

	Not at all Important						Very Important
d) How lucky you were in having everything just work out well.	/	/	/	/	/	/	/
e) How much the child enjoys being with adults.	/	/	/	/	/	/	/
f) How pleasant a disposition the child had.	/	/	/	/	/	/	/
g) How well the neighbor had set things up for you in advance.	/	/	/	/	/	/	/
h) The child is being rested.	/	/	/	/	/	/	/
i) How much you enjoy being with children.	/	/	/	/	/	/	/
j) How good a mood you were in that day.	/	/	/	/	/	/	/
k) Whether the child's surroundings contained interesting things for the child to see or do.	/	/	/	/	/	/	/
l) The extent to which the child was alert and responsive to you.	/	/	/	/	/	/	/
m) How much special effort you made to get along with the child.	/	/	/	/	/	/	/

(The next question asks about bad experiences with children. Reasons for good interactions are not necessarily the same as those for unsuccessful ones. So please think about his situation without regard for the way you answered the first question.)

2. Suppose you took care of a neighbor's child one afternoon, and the two of you did not get along well. How important do you believe the following factors would be as possible reasons for such an experience?

	Not at all Important						Very Important
a) How unlucky you were in having everything just work out wrong.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
b) How unpleasant a disposition the child had.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
c) Whether the child was tired or not feeling too well.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
d) Not really enjoying children that much.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
e) Whether the child doesn't like other people taking care of him.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
f) Whether or not this was a bad day for the child, e.g., whether there was nothing good on TV, whether it was raining and he or she couldn't go outside.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
g) The extent to which your neighbor failed to set things up.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
h) How much your mind was preoccupied with other things that day and you didn't give your full attention.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
i) Using the wrong approach for this child.	/___/	/___/	/___/	/___/	/___/	/___/	/___/
j) The extent to which the child was stubborn and resisted your efforts.	/___/	/___/	/___/	/___/	/___/	/___/	/___/

	Not at all Important							Very Important
k) How you get along with children in general.	/____/	/____/	/____/	/____/	/____/	/____/	/____/	/____/
l) How unsuited the physical environment was for a child, e.g., not enough space, not enough to do.	/____/	/____/	/____/	/____/	/____/	/____/	/____/	/____/
m) What kind of a mood you were in that day.	/____/	/____/	/____/	/____/	/____/	/____/	/____/	/____/

APPENDIX F.

BECK INVENTORY

Name _____ Date _____

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. **Be sure to read all the statements in each group before making your choice.**

1 0 I do not feel sad.
1 I feel sad.
2 I am sad all the time and I can't snap out of it.
3 I am so sad or unhappy that I can't stand it.

2 0 I am not particularly discouraged about the future.
1 I feel discouraged about the future.
2 I feel I have nothing to look forward to.
3 I feel that the future is hopeless and that things cannot improve.

3 0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failures.
3 I feel I am a complete failure as a person.

4 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am dissatisfied or bored with everything.

5 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

6 0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.

8 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.

9 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

0 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.

1 0 I am no more irritated now than I ever am.
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.

12 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.

14 0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.

15 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.

18 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.

19 0 I haven't lost much weight, if any, lately.
1 I have lost more than 5 pounds. I am purposely trying to lose we
2 I have lost more than 10 pounds. by eating less. Yes_____ No__
3 I have lost more than 15 pounds.

20 0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think about anything else.

21 0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

APPENDIX G. INFORMED CONSENT

TO ALL RESEACH PARTICIPANTS

This project is being conducted under the supervision of Helen P. Crowe and Dr. Philip S. Zeskind; the purpose of which is to monitor how individuals respond to a series of infant cry sounds. Below are listed some of the items of information you should know when deciding to participate in this study.

(1) No psychological or physical harm is expected to result from your participation in this project.

(2) Your agreement to participate would be voluntary and thus can be withdrawn at any time by you without penalty.

(3) All information gathered from your responses is for research purposes only. Therefore, your responses will remain completely confidential.

(4) Participation in this project will require approximately 90 minutes of your time.

(5) This project has been approved by the Human Subjects Research Committee and the Institutional Review Board of Virginia Polytechnic Institute and State University. Any questions you have regarding this project may be answered by contacting one of the individuals listed below.

Dr. H. Crawford (961-6520): Human Subjects Committee
Dr. P.S. Zeskind (961-6598)
Helen P. Crowe (961-6581)

(7) A copy of this consent form is available if you wish to retain a copy for your personal records.

If you consent voluntarily and with an understanding of the conditons outlined above to participate in this project, please sign your name below. Thank you very much for your assistance.

Participant: _____ Date: _____

Investigator: _____ Date: _____

APPENDIX H.

CRY #1

SIMILAR _____:_____:_____:_____:_____:_____:_____: DIFFERENT
to my baby's cry from my baby's cry

CRY #2

DIFFERENT _____:_____:_____:_____:_____:_____:_____: SIMILAR
to my baby's cry from my baby's cry

CRY #3

SIMILAR _____:_____:_____:_____:_____:_____:_____: DIFFERENT
to my baby's cry from my baby's cry

CRY #4

DIFFERENT _____:_____:_____:_____:_____:_____:_____: SIMILAR
to my baby's cry from my baby's cry

CRY #5

SIMILAR _____:_____:_____:_____:_____:_____:_____: DIFFERENT
to my baby's cry from my baby's cry

CRY #6

DIFFERENT _____:_____:_____:_____:_____:_____:_____: SIMILAR
to my baby's cry from my baby's cry

CRY #7

SIMILAR _____:_____:_____:_____:_____:_____:_____: DIFFERENT
to my baby's cry from my baby's cry

CRY #8

DIFFERENT _____:_____:_____:_____:_____:_____:_____: SIMILAR
to my baby's cry from my baby's cry

APPENDIX I.

Procedure to Control for Unequal Group Sizes

Based on a review of several studies, Stevens (1986) supports the use of Newman Keuls post hoc comparisons when group sizes are unequal provided that n is replaced by the harmonic mean for each pair of groups. For groups i and j with sample sizes n(i) and n(j), n was replaced by:

$$\frac{2 \times n(i) \times n(j)}{n(i) + n(j)}$$

VITA

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PERSONAL

Date of Birth: February 7, 1963
Marital Status: Married
Social Security Number: 116-60-1890

EDUCATIONAL BACKGROUND

Degree	Year	University	Area of Emphasis
B.A.	1985	State University of New York at Albany	Psychology
M.S.	1987	Virginia Polytechnic Institute and State University	Clinical Child Psychology
Ph.D.	1990	Virginia Polytechnic Institute and State University	Clinical Child Psychology

ACADEMIC DISTINCTIONS AND PROFESSIONAL MEMBERSHIPS

1985 Graduated Magna Cum Laude State University of New York at Albany

1985 Graduated with Honors in Psychology State University of New York at Albany

1984 Awarded Membership in Phi Beta Kappa

1988 Student Affiliate of American Psychological Association

1988 Student Affiliate of Society for Research on Child Development

TEACHING EXPERIENCE

Instructor for Psychology of Personality
Virginia Polytechnic Institute and State University
September (1988) -- May (1989)

Instructor for Laboratory in Psychology of Personality
Virginia Polytechnic Institute and State University
March--May, 1985; 1986

Helen P. Crowe
VITA

Instructor for Laboratory in Social Psychology
Virginia Polytechnic Institute and State University
January--March 1986

Laboratory Instructor for Introduction to Psychology
Virginia Polytechnic Institute and State University
September 1985--September 1987

CLINICAL EXPERIENCE

Pre-Doctoral Internship (Sept 1989 - present)
Georgetown University Hospital Child Development Center
Director of Psychology: Kathy S. Katz

Responsibities primarily included pyschodiagnostic testing and case management through the following interdisciplinary teams, Developmental Disabilities, Learning Disabilities and Developmental Evaluation of High Risk Infants. In-patient consultation to general pediatrics, Hematology-Oncology, Renal and Eating Disorders Clinics, as well as out-patient therapy to children and families were also provided.

Graduate Practicum Placement (Sept. 1988 - May 1989)
Virginia Polytechnic Institute and State University
Psychological Services Center
Director: Richard M. Eisler

Responsibilities included primary case management and providing case supervision for beginning therapists. Services are provided for residents throughout the Montgomery County region, as well as referrals from the Department of Social Services. Primary cases included neuropsychological assessment, child maltreatment, and marital discord.

Graduate Practicum Placement (May--August 1987; 1988)
The Medical-Behavioral Unit - University Hospitals
Case Western Reserve Medical School
Director: Lynn Singer, Ph.D

Responsibilities included assessment and treatment of pediatr cases on a medical inpatient unit. Presenting problems consisted primarily of failure to thrive, encopresis, eating disorders and non-adherence to medical regimens. Conducted a parent support group. In-patient consults involving assessment of suicidal risk and/or psychological evaluations were also completed for specialty clinics.

Graduate Practicum Student (September 1985--May 1987)
Virginia Polytechnic Institute and State University
Psychological Services Center
Director: Richard M. Eisler

Responsibilities included cognitive-behavioral assessment and treatment for Blacksburg area outpatients. Clients included children and adults with a variety of presenting problems including social phobia, attention deficit disorder, marital discord, depression, and parent training.

Volunteer Counselor, Parent Support Group (January--May 1986)
Substance Abuse Services, Blacksburg Virginia
Director: Linda Friese

Participated in the coordination and implementation of a support group for new teenage mothers. Provided individual counseling for one mother under the direction of the Department of Social Services.

Helen P. Crowe
VITA

Graduate Clinician-Research Assistant (September 1985-May 1986)
Social Behavior Project
Virginia Polytechnic Institute and State University
Director: Thomas H. Ollendick, Ph.D

Responsibilities included assessment of children identified as aggressive or withdrawn and the implementation of social skills and cognitive problem-solving training programs in local elementary schools.

Co-Therapist: Adolescent Self-Enhancement Group (January-March 1986)
Blacksburg High School, Blacksburg, Virginia
Supervisor: Richard M. Eisler, Ph.D

Responsibilities included conducting a support group for socially disadvantaged adolescents, in conjunction with providing social skills training.

RESEARCH EXPERIENCE

Doctoral Dissertation (May 1990)
Virginia Polytechnic Institute and State University
Chairperson: Philip S. Zeskind, Ph.D

Effects of Infant Temperament, Perceived Control, Parenting Stress and Depression on Mothers' Susceptibility to Learned Helplessness

Master's Thesis (September 1986-December 1987)
Virginia Polytechnic Institute and State University
Chairperson: Philip S. Zeskind, Ph.D

The Relation Between Scores on the Child Abuse Potential Inventory to Physiologic and Perceptual Responses to Normal- and High-Pitched Infant Cry Sounds

Chronic Tension Headache Project (January 1987 - Present)
Virginia Polytechnic Institute and State University
Supervisor: Debra F. Neff, Ph.D

Provided relaxation training for adults suffering from chronic tension headaches, completed psychophysiological assessments of muscle tension and participated in data collection.

Fire Anxiety Project (September 1986--May 1987)
Virginia Polytechnic Institute and State University
Supervisor: Russell T. Jones, Ph.D

Participated in the design and implementation of instruments assessing anxiety in children who were involved in residential fires.

PROFESSIONAL PAPERS

Crowe, H.P. & Zeskind, P.S. (1990). Psychophysiological and perceptual responses to infant cries varying in pitch: Comparison of adults with low and high scores on the Child Abuse Potential Inventory. Manuscript submitted to Infant Behavior and Development.

McMahon, C., Camp, K., Crowe, H., & Young, D. (1990). Collateral Effects of an Outpatient Feeding Model for Infants and Toddlers with Failue to Thrive. Paper to be presented at The Association for Behavior Analysis, Nashville, Tennessee.

Neff, D., Broyles, S., Edwards, M., Sikkema, K., Crowe, H., Gould, R., Jasie, D., Kudlas, J., & Bonner, M. (1989). The Influence of Success Experiences on Chronic Tension Headache Treatment Outcome, Paper presented at the Society of Behavioral Medicine, San Francisco, Spring.

Jones, R.T., Ribbe, D.P., Randall, J. & Crowe, H.P. (1988). Factors Affecting the Behavior of Residential Fire Victims. Paper presented at the Association for the Advancement of Behavior Therapy, New York (November).

Crowe, H.P. & Zeskind, P.S. (1988). The Relation Between Scores on the Child Abuse Potential Inventory and Physiological Responses to Infant Cry Sounds. Paper presented at The Conference on Human Development.

Oswald, D., Crowe, H.P. & Ollendick, T.H. (1987). Multi-Method Assessment in the Identification of Socially Dysfunctional Children. Paper presented at the Association for the Advancement of Behavior Therapy, Boston, MA.

Ollendick, T.H., Crowe, H.P. & Oswald, D. (1986). Self-efficacy: Differences Between Withdrawn, Aggressive and Popular Children. Paper presented at the Association for the Advancement of Behavior Therapy, Chicago, Ill.

Ollendick, T.H., Oswald, D. & Crowe, H.P. (1986). Self-Efficacy Scale for Children: A Validation Study. Paper presented at the Association for the Advancement of Behavior Therapy, Chicago, Ill.

REFERENCES

Philip S. Zeskind, Ph.D Chairman of Developmental Psychology
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

Thomas H. Ollendick., Ph.D Director of Clinical Training
Virginia Polytechnic Institute and State University
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