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Personality and Psychophysiological Variables in Maltreating Mothers

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PERSONALITY AND PSYCHOPHYSIOLOGICAL
VARIABLES IN MALTREATING MOTHERS

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A Dissertation
Submitted to the Graduate Faculty
of the
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in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

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This Dissertation submitted by William N. Friedrich in partial fulfillment of the requirements for the degree of Doctor of Philosophy from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

John Tyler
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Jim Clark
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This Dissertation meets the standards for appearance and conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

Dean of the Graduate School

Permission

Title PERSONALITY AND PSYCHOPHYSIOLOGICAL
VARIABLES IN MALTREATING MOTHERS

Department Psychology

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ABSTRACT

This study was designed to systematically investigate personality, psychophysiological, and cognitive appraisal variables in three groups of mothers, i.e. abusive, neglectful, and low-income control. The first two groups of mothers had been investigated by a county welfare agency and an abuse or neglect charge in the previous 12 months was substantiated with the mother identified as the main perpetrator. These two groups consisted of 14 and 13 mothers respectively, who had been randomly chosen from pools of 26 and 27 mothers respectively. A group of 15 mothers receiving aid from the same county agency was randomly chosen from a pool of 20 mothers and served as the control group. This group of mothers had been characterized by their caseworkers as performing an adequate job of parenting, and had not had a report of child maltreatment substantiated against them. The mothers were recruited from a study of parenting attitudes and provided with \$10, babysitting, and transportation to a neutral testing site. All subjects completed a Mini-Mult, the Repression-Sensitization Scale (R-S), the Group Embedded Figures Test (GEFT), the Multiple Affect Adjective Checklist (MAACL), and the Socialization Scale from the California Psychological Inventory. The mothers then listened to a nine-minute audiotope containing nine one-minute segments of either white noise, tone, or an infant's cry. During this tape, heart rate, finger blood volume, and skin resistance measures were recorded. After the audiotope

was finished, the mothers rated six dimensions of the infant's cry on a semantic differential: Age, Length, Loudness, Irritating, Anger, and Demanding.

The results indicated that the three groups did not differ on most demographic variables, i.e. Age, Education, Marital Status, Income, or Mean Age of Children. However, a significant difference was noted on the variable Total Number of Children, with the two groups of maltreating mothers averaging approximately one more child than the control mothers. In addition, the three groups differed significantly on the F, D, Pd, Pt, and Sc scales from the Mini-Mult, the Anxiety and Hostility scales on the MAACL, the Socialization Scale, and the GEFT. On the Semantic differential scale, the mothers differed on Demanding, Angry, and Irritating. On the psychophysiological variables, the groups did not differ on the cardiovascular measures, but differed significantly on skin resistance measures. Utilizing a combination of personality, psychophysiological, and cry rating variables, a discriminant analysis was successful in discriminating 80% of the subjects. Two significant discriminant functions resulted, the first defined primarily by the Pd scale from the Mini-Mult and the second by Demanding from the cry rating scale.

The pattern of results from the measures of skin resistance suggested that both neglectful and abusive mothers were more easily aroused and remain aroused for longer periods of time than did the control mothers, who habituated more rapidly. The neglectful mothers showed even less ability to differentiate the audiotape stimuli, responding with greater arousal across all stimuli. The two groups did

not differ on initial level of arousal to the two cry segments, but the control group habituated much more rapidly on each occasion.

With regard to the personality variables, the neglectful mothers were clearly the most pathological as a group, followed closely by the abusive mothers. In addition, the pattern that emerged suggested that maltreating mothers as a group were more hostile, impulsive, more field-dependent, had more interpersonal difficulties, were more easily overwhelmed than control mothers, and responded less appropriately on their ratings of the infant's cry.

This study also suggested that a possible avenue of intervention may be to use cognitive relabelling to assist maltreating mothers in learning to inhibit their inappropriate responses to their children's behavior.

CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

Spinetta and Rigler (1972) summarized the literature on abusing parents that existed up until 1969. At that time, psychologists had largely neglected this area of research, and few well-designed studies of personality characteristics of abusing parents had been published. The literature in the area consisted primarily of discussions of the medical and legal aspects of abuse and neglect. The intent of that review was to examine the professional opinions that existed at the time on the psychological characteristics of abusive parents, and to posit some hypotheses that could be subjected to empirical examination. Essentially four conclusions were reached: (1) the abusing parent was himself deprived as a child; (2) the abusing parent lacks accurate knowledge concerning child rearing; (3) these parents have a character defect which allows aggressive impulses to be expressed too freely; and (4) socioeconomic stresses are neither necessary nor sufficient causes of physical abuse.

These four conclusions of Spinetta and Rigler (1972) have served to organize and direct much of the research that has been done in this area in the past decade. This thesis reviews the findings of over ten years of controlled research in these four areas, i.e. child abusers as children, child abusers' knowledge of parenting, personality of child abusers, and stress and the child abuser. Literature pertinent

to each of these areas is presented. In addition, a research design is presented. This design is derived from research on both the personality and also the effects of stress on maltreating parents.

Child Abusers as Children

Behavioral scientists from several disciplines agree that children are more often than not similar along personality dimensions to their parents, and utilize child-rearing methods similar to those used by their parents. Whether these similarities between parent and child result from genetic or/and social learning mechanisms is still being debated. The existence of similarities has prompted considerable research that examines adults' perceptions of their childhood experiences. Spinetta and Rigler (1972) report that a history of emotional deprivation and/or loss of a significant parental figure early in life was a unanimous finding in the various clinical reports about abusing parents that they reviewed. How well has this conclusion fared under the impact of further research?

Disbrow, et al. (1977) compared an abusive-neglectful group of parents with a matched, control group of parents and discovered that the two groups differed in whether they were abused as children, with the abusive-neglectful group reporting a greater incidence of abuse as children. However, no differences in early rearing were noted between abusive parents and neglectful parents. Both groups reported similar amounts of abuse as children. The authors used path analysis to statistically interpret the data and suggested that a direct connection existed between the parent's background of abuse as a child and the personality, social resources, ways of handling irritating child

behaviors, parental attitudes, and the physiological response the parents had in response to their child's behaviors.

Loveland (1977) found that neglectful mothers reported experiencing as children a significantly higher level of physical punishment for aggressive and nonaggressive acts than a reference group of mothers similar in socioeconomic and educational variables. He measured a variety of variables, including self-esteem and discipline practices and found that the mothers' reported level of receiving physical punishment for aggressive behavior as a child was the most highly intercorrelated measure with all of the other variables. Wolock and Horowitz (1977) reported differences in the parent's background even when the maltreating parents and the control parents were all on public assistance. The former group was less likely to have been raised by both parents, and more likely to report having been beaten as young children. Conger (1977) discovered that abusive parents were more likely to report severe physical punishment as part of their own upbringing than either neglectful or control parents. He was able to find differences between abusive and neglectful mothers in terms of upbringing, whereas Disbrow, et al. (1977) did not. In a British study, Smith and Hanson (1975) found a significantly greater percentage of abusive parents reporting impaired relationships with their parents than did members of a control group. The abusive parents described their parents as harsh, rejecting, and unreasonable in their discipline, and given to frequent use of physical punishment.

The Michigan Screening Profile of Parenting (MSPP) (Helfer, Schneider, & Hoffmeister 1977), which was developed to detect parents at risk for abuse, has a number of factors, including one entitled

Relationship with Parents. Gaines, et al. (1978) used the MSPP with abusive, neglectful, and control parents and were unable to find differences between groups on the factor Relationship with Parents, which measured how the parent viewed his own parents and upbringing. The authors then independently derived a number of factors other than the original MSPP factors. One of these factors, which consisted primarily of items on the factor Relationship with Parents, was a significant contributor to a discriminant analysis of these three groups of parents, with the control parents reporting the most satisfactory relationship with their parents. The MSPP was also used by Spinetta (1978) with six groups of mothers: adjudicated abusers, spouses of adjudicated abusers, mothers convicted of child neglect, and three control groups of non-abusing mothers, differing in levels of education and income. Significant between groups differences were found on the factor Relationship with Parents, with the first three groups being very similar to one another.

The finding of differences between abusive and control parents in their history of abuse as children has not been unanimous. Ceresnie (Ceresnie 1976; Ceresnie & Starr 1977) failed to find differences between matched samples of abusive and non-abusive mothers on reports of whether they were abused as children, and attributed this to the face-valid nature of the scale used to measure this dimension. This failure was duplicated in another study which did not find significant differences in self-reports of abuse and neglect in the life histories of abusive and control mothers of similar socio-economic status (Griswold & Billingsley 1969). Hagenau (1977) was unable to find differences in

reported upbringing between abusive women and nonabusive women who had been convicted of assault of an adult.

A number of factors may contribute to the failure to find differences between abusive, neglectful, and control groups in their reports of their parents' behavior. For example, agencies which investigate abuse and neglect differ widely in their operational definitions of these two phenomena. In addition, in many cases, abuse and neglect are both present, but the parent is charged with what is most easily substantiated (Friedrich & Boriskin 1976a). It is also important to determine whether the research utilized test data from a pre-sentencing investigation of the parents, or whether the parents suspected that the information gathered would be used against them. Finally, the reading level of these parents is not always determined, even in those studies relying heavily or solely on pencil and paper tests (Gaines, et al. 1978).

Jayaratne (1977) has taken issue with the common assumption that child abusers experienced abuse themselves as children. He cites several authors who report that abuse was common, but not universal, in the childhood of abusive parents. In addition, the lack of a normative comparison group is seen as a recurring problem. Jayaratne also reports that emotional abuse and physical abuse are considered as single phenomena in studies reporting abuse in the background of abusive parents. Whether or not this is valid needs to be examined empirically. He proposes three other areas of research that need to be investigated before the generational hypothesis of child abuse can be considered valid. For example, given that abuse affects all the children in a family, it would be important to determine whether the

adult siblings of abusive parents are also abusive. In addition, research is needed to determine whether abusive and control parents differ not only on reported childhood experiences but also in terms of actual experiences as children. No research has yet been done that examines differential effects of emotional versus physical abuse experiences. Finally, since there is still considerable debate as to what small portion of adult behavior is predicted by childhood experiences, the utility and validity of reports of childhood experiences is still in question.

These are valid criticisms and need to be addressed. The current literature has several investigations of the reports of the childhood experiences of abusive parents. There is a common, but disputed finding (Ceresnie 1976; Griswold & Billingsley 1969) of greater amounts of physical abuse in these individuals' background, but no explanations are offered for abusive parents who do not report this phenomenon, and no longitudinal study has yet reported the extent of this relationship. In addition, no study has yet been reported that examined non-abusive parents who had been abused as children.

Child Abusers as Parents

Spinetta and Rigler (1972) concluded that the primarily clinical, noncontrolled studies that they reviewed indicated a lack of appropriate knowledge of childrearing in abusive parents. In addition, these parents had aberrant attitudes, expectations, and child-rearing techniques resulting in their expecting "too much, too fast" from their children. An issue that needs to be addressed, however, is whether samples of abusers, who are most often drawn from low socioeconomic

categories, differ in their knowledge and attitudes when compared with a similarly deprived sample. Abusers who are facing court involvement or who recently were adjudicated may be able to respond in a socially desirable manner, thus eliminating any between-group differences. And finally, attitudes and knowledge of childrearing do not necessarily predict behavior. In the final analysis, actual behavior needs to be analyzed, in addition to attitudes.

The results of studies examining parental reports of attitudes and knowledge are somewhat equivocal. Ceresnie (1976) found that measures of maternal child-rearing attitudes, in conjunction with home observations of mother-child interaction, were the most powerful discriminators between abusive and control families. However, no differences were demonstrated in parental knowledge of developmental norms. Loveland (1976) found that neglectful mothers reported significantly greater useage of physical punishment for both aggressive and common misbehaviors than did mothers from a matched control group. However the two groups did not differ on their knowledge of discipline options, the reported effectiveness of their discipline procedures, and the reported ease with which their children are disciplined. Disbrow, et al. (1977) found that abusers, neglectors, and spouses of abusers differed from control parents in greater use of physical and withholding types of punishment, and were less likely to reason with the child or consider the behavior as normal on the part of the child. Stultz (1976) noted that abusive mothers valued the use of parental power with their children and were less able to empathize with them. However no differences between abusive mothers and two control groups of mothers were found on a measure of what parents could expect at different ages

in terms of their child's behavior. Egeland and Brunquell (1979) attempted to differentiate good from inadequate mothers based on data prior to the occurrence of any abuse or neglect and found that a factor based on the mother's understanding of the psychological complexity of the infant and her relationship with the infant contributed most to a correct discrimination. However, when using data including mother's knowledge of child rearing, personality, behavior during feeding with the child, infant temperament, etc., interaction between mother and child during feeding was the best discriminator. In this case, behavior accounted for more variance than child-rearing knowledge and attitudes. The longitudinal nature of the study lends further credence to the finding of the primacy of behavior, rather than knowledge or attitudes.

Gaines, et al. (1978) found that responses to a child-rearing questionnaire were not significantly different between abusive, neglectful, and control parents, and failed to contribute significantly to the discrimination between the two groups. However, Spinetta (1978) did find significant differences in expectations of one's child between abusive mothers, spouses of abusers, neglectful mothers, and three other control groups of mothers. The difference was most significant, however, between the low-income abusers and a middle-income control group, and it seems obvious that cultural and educational differences influenced this finding. Wolock and Horowitz (1977) did not find consistent differences in child-rearing knowledge or attitudes between abusers and nonabusers, all of whom were on public assistance.

Popular measures of child-rearing attitudes, particularly the Parent Attitude Research Inventory (PARI) have not demonstrated a

relationship to actual parent behavior or to the child's later development, and are particularly invalid with parents from low income brackets (Becker and Krug 1965). However, this has not prevented the PARI from being used, with mixed success, with abusing parents. Hagenau (1977) used the PARI to successfully discriminate abusers from a control group of assaultive women. Paulson, et al. (1977) was able to correctly classify abusive and control parents with only 65% accuracy when using the PARI, which is 15% above chance, and Berg (1976) failed to find either the PARI or a parental expectations survey to be useful discriminators between abusing and control parents.

Several studies of family interaction in abusive families have been reported (Burgess & Conger 1977; Conger 1977; Reid & Taplin 1976). One large study investigated 10 abuse, 10 neglect, and 12 control families, and found that the abuse and neglect families were more negative, less positive, and spoke less than the controls (Conger 1977). These differences resulted largely from the mother's behavior in the abuse families, whereas both father and mother contributed in neglect families. In addition, the abuse families showed a distinctly lower rate of physical interaction than either of the other family types. Another large study of 17 abuse, 17 neglect, and 19 control families supported these findings (Burgess & Conger 1977). They concluded that the lower rate of positive, negative, or neutral physical interaction in the abuse families indicates that the parents, particularly the mothers, are unskilled in the use of physical contacts, so that when they do employ physical behavior, they tend to do so inappropriately or excessively. Reid and Taplin (1976) examined 27 control families, 27 abusive families, and 61 distressed but nonabusive families in the home

environment. A composite of behaviors called Total Aversive Behavior (TAB), which consists of 14 categories of highly aversive behaviors, e.g. Destructiveness, Humiliation, Physical Negative, etc., was examined. The mean rates of TAB were higher for all members of abusive families in comparison to their counterparts in the other groups, with mothers and index children revealing significant between group differences. Two other categories were examined, and both Physical Negative Behaviors and Command Negatives were also higher for mothers and index children in the abuse group. The fact that the index child was as high in Total Aversive Behavior as the abusive mother suggests that the child is not a passive participant in the abuse process and often behaves in a way that perpetrates the abusive cycle. In addition, the abuse families were characterized by an overall tendency to handle problems in a physical, aggressive manner.

Jayaratne (1977) has taken issue with the common assumption of parental inadequacy in abusive parents. He reports that a longitudinal study has shown that nonabusing teenage parents tend to interact with their children in a manner similar to abusive parents, and calls for studies using comparison groups. However, his research was completed prior to the publication of some very adequately controlled studies which did report parental inadequacy in neglectful and abusive parents (Burgess & Conger 1977; Conger 1977; Reid & Taplin 1976). Although self-reports of parental attitudes are suspect as far as discriminating maltreating from control parents, behavioral ratings discriminate much more convincingly and argue for differences in parenting between these groups.

Personality of Child Abusers

The majority of the authors cited in the review by Spinetta and Rigler (1972) pointed to psychological factors within the parents as prime etiological variables in child abuse. Socioeconomic factors could aggravate these personality weaknesses, but by themselves were neither necessary nor sufficient causes of abuse. This has been an active area of research since the 1972 review. Other than two studies (Griswold & Billingsley 1969; Melnick & Hurley 1969) all of the controlled research has been published since 1970.

The MMPI Scales. The MMPI and its special scales have been used considerably in an effort to examine personality characteristics of child-abusing parents. Griswold and Billingsley (1969) reported that MMPI scales F, Pt, and Sc differed significantly between 12 abusive and 27 nonmaltreating mothers, and MMPI scales Hs, D, and Hy differed significantly between 8 neglectful and 27 nonmaltreating mothers. The 12 abusive and 8 neglectful mothers also differed significantly between each other on the MMPI scales Pt and Sc, with the abusing mothers having greater elevations on these scales.

Wright (1970) presented MMPI data on 15 abusive parents and reported that the profile was generally elevated, and had significantly higher than average scores on the Pd and Sc scales. Kaleita and Wise (1976) also noted that the Pd and Sc scales were the most elevated scales in 25 battering parents, lending some support to this finding. Wright (1976) also reported MMPI data on 13 convicted abusing parents and 13 nonabusive control parents. Significant differences on the L and K ($p < .05$) scales were noted and differences on the Pd scale just missed significance. The author coined the term "sick but slick" to

describe abusive parents. It appears that Wright combined the results of his two studies to arrive at this label, i.e. the "slickness" is derived from the elevated L and K scales in the 1976 study and the "sickness" is derived from the elevated Pd and Ma scales in the 1970 study.

This is a questionable tactic, and the defensiveness manifested in the 1976 study seems understandable in light of the fact that the MMPI was administered after the abuse episode as part of court proceedings.

Paulson, et al. (1974) found significant differences on the MMPI between abusive fathers and mothers, and on the L, F, Mf, Pa, and Ma scales of the MMPI across Abusers, Passive Abusers, Absolute Nonabusers, and Control parents who were similar in socioeconomic level. However, none of the mean scores for any of the MMPI scales exceeded a T-score of 70, but the Pd-Ma (4-9) profile and the Ma-Pd (9-4) profile had the highest mean T-score values for abusive females and abusive males, respectively.

Paulson, et al. (1975a) item analyzed the scores of the 60 index subjects and 10 control subjects from his 1974 experiment to devise male, female, and combined male and female abuser scales from the MMPI. Paulson, et al. (1975b) then used a subsample (N = 33) of the 60 index subjects from his 1974 study to include only active abusers. The same control sample was used (which was self-referred and older than the index subjects) and a discriminant analysis procedure was used to devise six more brief scales of the MMPI for the identification of abusive males and females. Furlong and Leton (1977) used an independent (N = 19) sample to determine the validity of Paulson's three scales derived

from item analysis and six scales derived by discriminant analysis. They correctly classified anywhere from 10% to 78% of their abusing parents, depending on the scale. However, these 19 subjects were characterized by a diverse ethnic mix, lower education, and lower age than Paulson's sample. Consequently, the validity of these derived, abuse-specific scales has yet to be determined.

Paulson, et al. (1976) has also used published, experimental subscales of the Pd and Ma MMPI scales and Megargee's Overcontrolled Hostility (OH) scale (Megargee, Cook, & Mendelsohn 1967) with 53 abusive and 113 control parents of similar socioeconomic status. The control parents had a child receiving outpatient services from a psychiatric clinic. Results indicated a significantly greater degree of psychosocial pathology and a significantly greater impulse predisposition in the abusive parents as a group, compared to nonabusive mothers and fathers of children receiving out-patient psychiatric services. In addition, females, both abusive and control, scored significantly higher than males on five of the Pd scales, and males, both abusive and control, scored significantly higher than females on 2 of the Ma scales.

Other General Personality Measures. A variety of other personality measures have been used with abusive parents. Hyman (1977) examined 40 abusive and 37 control subjects and reported average intelligence in the abusive parents along with significantly greater immature impetuosity in the abusive mothers and introversion in the abusive fathers, as measured by the 16PF. Smith, et al. (1973a) found significantly lower intelligence and greater neuroticism (as measured by the Eysenck Personality Inventory) in abusive mothers. Smith, et al.

(1973b) found an abnormal EEG in 8 of 35 parents who had abused their children. This subgroup also appeared to be more psychopathic and of lower intelligence. Smith and Hanson (1975) reported significantly greater amounts of hostility and neuroticism (as measured by the Eysenck Personality Inventory) in both abusive mothers and fathers when compared with nonabusive parents.

Melnick and Hurley (1969) compared 10 abusive and 10 carefully matched control mothers on 18 personality variables, largely from the TAT and the California Test of Personality. Abusive mothers seemed less able to empathize with their children, had a probable history of emotional deprivation, and had severely frustrated dependency needs. Evans (1977) compared 20 abusive and 20 carefully matched control mothers, all on AFDC and was able to discriminate 97.5% of the mothers. The best discriminators were four scales derived from the TAT, including frustrated independence, aggression pathogenesis, and frustrated dominance. The author interpreted this as indicative of the pervasiveness of the abusive mother's psychopathology, and concluded that basic character traits are involved.

Specific Personality Variables. Rosen (1978) found significant differences between 30 abusive and 30 control mothers in that the former mothers had lower and more inconsistent self-concepts, and expressed greater incongruence between the way they viewed themselves and the way they would like to be. Loveland (1977) compared 10 neglectful and 10 carefully matched control mothers, and although no significant differences were found between groups in self-esteem, the neglect group possessed a significantly higher number of deviant signs, a higher level of psychosis, and less personality integration than the reference

group. Ceresnie and Starr (1977) found significantly more alienation and social nonconformity in 20 abusive mothers when compared with 20 nonabusive control mothers. Kenel (1976) compared 43 child abusers, 43 nonabusers, and 50 aggressive offenders, and failed to find differences between groups on impulsivity, although the abusers and aggressive offenders reported significantly more mistrust, guilt, and more willingness to express anger.

Social isolation and interpersonal withdrawal are commonly reported behaviors of abusive and neglectful mothers (Smith, Hanson, & Noble 1974; Polansky, Chalmers, Bittenweiser, & Williams 1978; and Wolock & Horowitz 1977). Apparently, a mother must possess some sense of inner effectiveness in order to involve herself in support systems around her.

The MSPP has been used recently (Gaines, et al. 1978; Spinetta 1978) in several very important studies which elucidate personality characteristics of maltreating parents. Gaines, et al. (1978) found significant differences between a large group ($N = 240$) of abusive, neglectful, and low-income control mothers on two MSPP factors, Emotional Needs Met and Coping. Neglectful mothers, followed by abusive mothers, appeared as the least healthy on these two factors. Spinetta (1978) independently derived six factors from the MSPP and found significant differences between adjudicated abusers and non-abusers on the factors of 1) tendency to become upset and angry, 2) tendency toward isolation and loneliness, and 3) fear of external threat and control. Neglectful mothers differed significantly from the same control group on two of these same factors, i.e. 1 and 3, and also

on another factor labelled inability to separate parental and child feelings.

Milner and Wimberley (1979) devised a Child Abuse Potential Inventory with four factors, Loneliness, Rigidity, Problems, and Control, that was successful in discriminating a small group of abusive from non-abusive mothers. However, no other validation studies have been reported using this scale.

Abusive Fathers. Most of the above reports have focused on mothers. However, several studies have focused solely on fathers. Amberg (1977) found that 15 male inmates of the psychiatric unit of a state prison who had admitted in the course of psychotherapy that they had abused their children were compared on the Rorschach with 15 inmates who had not voluntarily acknowledged abusing their children, and 15 nonabusing fathers from the community. The protocols were independently evaluated and abusive fathers seemed less able to integrate emotion effectively with realistic thinking, and appeared less integrated with regards to personality structure. However, this is not surprising in that the fathers who voluntarily admitted abusing a child apparently were ready to disclose damning things about themselves. O'Hearn (1975) compared 23 abusive fathers with 23 carefully matched non-abusive fathers, and found significantly less self-esteem, ego strength, assertiveness, and greater feelings of powerlessness in the abusive fathers.

How similar are abuse and neglect? Since many studies do not differentiate these two, it would be very important to determine whether they are similar or diverse manifestations of inadequate parenting. Sourkes (1977) attempted to discriminate abuse and neglect

in the child care characteristics of 30 mothers whose infants were enrolled in a primary prevention mental health program. The mother's behaviors were rated as abusive or neglectful and the author examined what maternal variables predicted this behavior. Abuse and neglect shared some common variance, but in the main seemed unique. Socio-economic status, internal resources and external resources were important in predicting ratings of neglect. The findings were less clear for abuse, but both emerged as complex, psychosocial phenomena, with potentially different etiologies.

There is a considerable amount of evidence that personality does play a role as a determinant of child abuse, although there is no suggestion that factors of personality weakness and parental inadequacy are the sole determinants of child abuse. However, in the last several years, increasingly well-designed research has been published which adds to our awareness of the personality problems existing in this group. Some characteristics which have been found across several studies indicate that abusive parents have difficulty with impulse control, lowered self esteem, an impaired capacity for empathy, and are isolated interpersonally.

Stress and the Child Abuser

Spinetta and Rigler (1972) concluded that socioeconomic stresses are neither necessary nor sufficient causes of child abuse. They stated that if it was indeed true that abuse occurred in only a minority of socially and economically deprived families, and also did occur in other, less deprived families, the cause of child abuse had to lie beyond socioeconomic stresses.

Pelton (1978) has taken issue with this conclusion. While allowing that child abuse and neglect have indeed been found among all socioeconomic classes, he states that very clear evidence exists to show that abuse and neglect are not distributed proportionately among the total population, and that socioeconomic class variables are very important. Data from the national studies completed annually by the American Humane Association indicate that in 1975 and 1976, between 11% and 15% of abusive and neglectful families had incomes exceeding \$11,000. The median family income in 1976 for these families was \$5051, as compared to \$13,900 for all American families in the same year. Pelton also reports that child abuse and neglect are related to degrees of poverty, with the highest level of child maltreatment occurring in families living in the most extreme poverty.

Pelton's arguments have support in other studies which have shown that stress, although not exclusively socioeconomic, are related to child abuse and neglect. For example, Justice and Duncan (1976) were able to show a relationship between life change and child abuse when they compared 35 abusing parents with a control sample of 35 nonabusing parents on the Social Readjustment Rating Scale. The mean score on the rating scale was 234 for the abusing parents and 124 for the nonabusing parents. Rather than economic or environmental stress, the distinguishing factor between the groups was change, which was requiring constant readjustment.

Gaines, et al. (1978) performed a stepwise multiple discriminant analysis between 80 abusive, 80 neglectful, and 80 control mothers. The 12 independent variables measured types of stress, parenting factors, some personality dimensions, and a measure of infant risk. Two of the

six significantly discriminating variables were related to stress, the first measuring negative life experiences typically encountered by very poor families, and the other one similar to the scale used by Justice and Duncan (1976). Neglectful mothers were discriminated from abusive and control mothers on the basis of the first stress variable, a factor from the MSPP called Emotional Needs Met, and on a dimension related to coping and stress. This study is limited because of its reliance on a large number of paper and pencil surveys that were difficult for many of the mothers to fill out, because 88% of the variance was left unexplained, and parent category could be predicted only 15% better than chance. Regardless of these deficiencies in Gaines', et al. (1978) study, it is increasingly questionable whether maltreatment can be primarily attributed to childrearing attitudes or specific personality variables. Rather, stress and the ability to cope with stress seem to be more important.

At present, it appears that the conclusions concerning the four areas of research reviewed by Spinetta and Rigler (1972) have not all withstood the brunt of careful research. The evidence seems to support the earlier hypotheses that abusing parents were maltreated as children, and the existence of some personality variables that discriminate abusive from nonabusive parents, and abusive from neglectful parents. However, the evidence is rather mixed with regard to whether maltreating parents lack adequate parenting knowledge. Rather, evidence points to actual differences in parenting and not to differences in childrearing attitudes. In addition, it appears that stress, and particularly socioeconomic stress, is an extremely important variable to consider in future research. The most comprehensive study to date (Gaines, et al.

1978) has indicated that stress overshadows personality variables in importance when discriminating between neglectful, abusive, and control mothers. Yet at the same time, stress somehow interacts with personality and child variables to "potentiate maltreatment by widening the discrepancy between limited parental capacities and demanding offspring" (Gaines, et al. 1978, p. 532).

This interaction between stress and personality variables needs to be more closely and systematically examined. For example, do maltreating mothers respond similarly to all types of stress, or is the response exclusively to socioeconomic stressors? It would seem that a well-designed, ego-specific stressor should be able to elicit a similar interaction in mothers for whom child abuse reports have been substantiated. Let us now turn to a brief review of stress induction and measurement, since the purpose of the present study is to explore the interaction of physiological and personality variables brought about through a laboratory induced stress in samples of abusive, neglectful, and control parents.

Stress Induction, Measurement, and Personality

Although stress is an increasingly studied psychological phenomenon, considerable variation exists as to its definition, means of induction, and measurement once induction has occurred. A variety of stress induction techniques exist, e.g. specific ego threat, shock, threat of shock, extreme cold, competition, novel sensory stimuli, actual loss, perceived loss, etc. Kahneman (1970) cites a number of indices of a stressed state: self-reports of mood or anxiety, attention to task, skilled cognitive or motoric tasks (which can confound measurement), and a variety of physiological responses including heart rate, galvanic

Some interesting, but by no means definitive, literature exists on the relationship of personality variables to physiological response (Lacey, et al. 1963; Lacey & Lacey 1970). For example, cardiac and skin conductance responses are not equally predicted by a person's earlier history. Cardiac response in particular seems to be related to a "response set" in the individual, with cardiac acceleration showing a relation to mental concentration and skin conductance failing to show this relationship. Of the two variables, skin conductance is more closely and directly related to that operationally difficult to define concept of anxiety or arousal in response to stress. Skin conductance is usually considered the most reliable index of general sympathetic arousal, whereas heart rate represents a more complex response than general, overall arousal. Lacey (1967) has stated that "palmar conductance and heart rate . . . are shown . . . to have differential significance for behavior, palmar conductance being a generalized response and heart rate a response with more specific correlates."

Edelberg (1972) argues that the equation of electrodermal activity to level of arousal or to emotional activity constitutes an abstraction based on an assumption that there is a direct relation between sympathetic activity and these behavioral correlates. Given the complexity of the electrodermal reflex and the presence of inhibitory centers, such a conceptual leap may be unwarranted. However, a pattern of consensual validation is developing in some areas, and the researcher is warned that electrodermal activity can be measured in at least three, noninterchangeable ways, i.e. skin conductance, response frequency (i.e. rate of occurrence), or the response amplitude.

Numerous attempts have been made to show significant differences in electrodermal activity of groups selected on the basis of scores on psychological tests. Lacey (1967), for example, has viewed electrodermal activity as facilitating the transaction between an organism and its environment, and has suggested that the pattern of response can be expected to vary in accordance with whether the individual is open to his environment or tends to reject it. A similar phenomenon has been demonstrated with peripheral blood flow in adults, which tends to increase during tasks that elicit inward direction of attention and cognitive elaboration, and tends to decrease during tasks that elicit outward direction of attention and sensory intake (Williams, Bittker, Buchsbaum, & Wynne 1975). Witkin and Goodenough (1977) report in their review of field-dependence that field-independent people are prone to use "turning against object" as a characteristic defense, and field-dependent subjects use "turning against the self." This and the fact that field-dependent individuals have a greater interpersonal orientation than field-independent persons ties into Lacey's notion of an individual's openness to the environment, and also fits neatly into differential cardiac acceleration or deceleration.

Repression-sensitization is also related to this concept, and has the advantage of having been related to electrodermal activity in a number of empirical studies. Goldstein (1977) has reported that when compared to sensitizers, repressors are more labile physiologically, particularly on measures of skin conductance. An earlier study (Parsons, Fulgenzi, & Edelberg 1969) also supports the finding of greater skin conductance responsivity in repressors. Rona (1976) has reported that although repressors display significantly less verbal report of anxiety

than sensitizers, they have a significantly longer recovery on three measures of physiological arousal: heart rate, skin conductance, and finger blood volume.

Another particularly interesting variable is socialization. Poorly socialized individuals are characterized by tendencies toward impulsivity, lack of restraint, superficial interpersonal relationships, and a history of interpersonal conflict despite normal intelligence. Many of these characteristics are similar to those used to describe maltreating parents. In addition, some previous research (Waid 1976) has shown that low scorers on the Socialization scale of the California Psychological Inventory gave much smaller skin conductance responses to noxious noise bursts than did subjects scoring high on socialization.

Less conclusive research has been reported comparing psychological tests with cardiovascular activity (Gunn, Wolf, Block, & Person 1972). Gunn and his colleagues reported rises in blood pressure in response to the discussion of conflictual periods while under hypnotic regression. They also demonstrated that anxious, nonaggressive subjects habituated more slowly on a measure of blood pressure than less anxious, aggressive subjects. Lacey's (1967) findings of differential fractionalization has indicated the complexity of the heart rate response in comparison to the electrodermal response, and suggests the importance of pairing these two measures of physiological activity in order to tap not only a generalized response, but also a response with more specific correlates.

Specific Stressors. The number of potentially stressful stimuli is considerable. Infant crying is a very ego-specific stimulus that does contain stressful and noxious components. Murray (1979) reviewed the literature on infant crying as an elicitor of parental behavior.

Two similar models have long existed in the literature: the first is that of the cry as a releaser of parental behavior, and the second is of the cry as an activator of motives of an egoistic or altruistic nature. In the first model, the cry is viewed as a distress signal that originally evolved to promote proximity between infants and their caregivers. The cry is seen to act as a releaser of a fixed motor response in the receiver. In the second model, the cry is viewed as an involuntary reflex action to distress. The parent's response can be egoistic or self-serving (which would account for attempts to avoid the cry) or the response can be altruistic (which would account for parental responses aimed at removing the infant's discomfort). Studies of the physiological responses to crying range from reports of seizure-like activity in the limbic system of a teenager who murdered her two sisters when they were babies, to a more rapid let-down reflex in breastfeeding mothers as opposed to bottlefeeding mothers. However, studies of skin conductance and heart rate responses to infants crying either do not exist or were not reviewed by Murray (1979). The models she posited argue for a differential response in mothers who differ along the dimensions of parental behavior and egoistic or altruistic motives.

The Research Design

The research just reviewed raises as many questions as it answers. For example, although numerous studies report personality differences between maltreating parents and control parents, very few use a low-income control group and even fewer attempt to differentiate between abusive and neglectful mothers. In addition, some investigators

have used personality assessment instruments that were only recently developed (e.g. the MSPP) or which measure very narrow dimensions of personality (e.g. self-esteem, isolation). Some personality dimensions which have been shown to differentiate maltreating parents from control parents, e.g. impulsivity, hostility, depression, need to be examined further using standardized personality assessment devices and appropriate control groups. Other questions arise with the literature on the importance of stress in the etiology of abuse and neglect. It appears that economic and environmental stress are of considerable importance, but these factors are also operating in low-income families that are non-abusive. Studies which examine the parent's response to other forms of stressors, specifically those which arise in the process of raising children, have not yet been reported. Other research should focus on maltreating parents' coping strategies in response to stress and their psychophysiological responses to stress. For example, do some parents cope more appropriately and utilize more effective strategies, e.g. cognitive relabeling, help-seeking, than other parents? Can parents be discriminated on the basis of their psychophysiological response to stress?

This study was designed to examine some of these questions. It explored differential response to a stressful stimulus (infant's cry) in three groups of mothers who differed with respect to extent and type of parental adequacy, i.e. neglectful, abusive, and non-neglectful, non-abusive comparison parents. Personality variables which are relevant to these groups of mothers, e.g. Mini-Mult,^{and} Depression, Hostility, and Anxiety from the MAACL were also examined. In addition, a number of variables, e.g. repression-sensitization, field-dependence,

and socialization, which have a demonstrated relationship with the psychophysiological response to stress, were also studied. The mother's self-reports of the various threatening aspects of the stimulus were also collected in order to measure whether their cognitive-subjective appraisal of the cry was related to their psychophysiological response and the personality variables of field-dependence, repression-sensitization, and socialization. In addition, the relationship of heart rate to skin resistance was also examined across groups, to determine whether directional fractionation existed and varied across groups. More specifically, the following questions were addressed:

1. Did the three groups of mothers differ in respect to physiological response and cognitive appraisal of a noxious and threatening (i.e. cry) stimulus?
2. Did the three groups of mothers differ in respect to the physiological response to a noxious, but nonthreatening (i.e. tone) stimulus?
3. Did the three groups of mothers differ in respect to personality variables measured by empirically validated personality inventories?
4. Did the three groups of mothers differ in respect to personality variables which have been shown to mediate the impact of stressful stimuli?
5. What was the relationship between group membership, repression-sensitization, socialization, hostility, anxiety, depression, and field-dependence to skin conductance and heart rate responses?

CHAPTER II

METHODS

Subjects

Same sex subjects were employed in this study in order to eliminate the sex differences which have been demonstrated in physiological responsivity to stressful stimuli (Edelberg 1972). There were three groups of Caucasian subjects. The first group was composed of 15 mothers who were receiving financial assistance from the Grand Forks County Social Services Center, and who were randomly selected from a pool of mothers (N = 20) nominated by the eligibility workers at the agency. This pool was composed of women who had not had any child abuse or neglect reports filed against them during the period of time they had been receiving aid from the county welfare office. The second group was composed of 14 mothers who in the past 12 months, had had a child abuse report substantiated against them. In each case, the investigation clearly indicated that the mother was the perpetrator. These mothers were randomly selected from a pool of mothers (N = 26) meeting the above mentioned requirements. The third group of 13 mothers were drawn from the same source as the abusive mothers, except that they had had a neglect charge substantiated against them in the past 12 months. They were randomly selected from a pool of mothers (N = 27) meeting the above mentioned requirements. Lists of the three groups of mothers were prepared by a caseworker. An assistant to the

principal investigator then randomly chose the subjects, so that the principal investigator would remain blind to the group status of each mother. A total of 16 mothers from each group were given appointments, but one control mother, two abusive mothers, and three neglectful mothers did not keep their appointments.

After each subject was randomly chosen, she received a letter inviting her to participate in a study of parenting and informing her that she would receive \$10.00 for her participation. She was also assured in the letter as to the absolute confidentiality of the results of this study. The mother was then contacted on the telephone by the assistant and personally enlisted and given an appointment time and directions to get to the Psychological Services Center in Montgomery Hall on the University of North Dakota campus. Babysitting and transportation were provided when necessary. Treatment of all subjects was in accordance with the ethical standards of the American Psychological Association (1973). A copy of the letter and consent form can be found in Appendices I and II.

Materials

The Group Embedded Figures Test (Witkin, Oltman, Raskin, & Karp 1971) was administered to measure field-dependence, a variable which has been shown to be related to interpersonal behavior and particular coping defenses.

The revised Repression-Sensitization scale (Byrne, Barry, & Nelson 1963), which consists of 124 items drawn from the MMPI, was used to measure a personality variable which has been demonstrated to be related to stress responsivity.

The Multiple Affect Adjective Checklist (MAACL) (Today Form) (Zuckerman & Lubin 1965) was administered to measure three variables, hostility, anxiety, and depression, all of which have been thought to be characteristic of abusive and neglectful parents. The MAACL consists of 132 adjectives which were checked by the subjects to indicate how they were feeling on that day.

The Socialization Scale of the California Psychological Inventory (CPI) (Gouch 1957), one of the 18 CPI scales, was also administered. It is a 54-item subscale and has been shown to have a mediating effect on skin resistance (Waid, Orne, & Wilson 1979). In addition, the scale was used to examine the suggestion that abusers are poorly socialized.

The Mini-Mult (Kincannon 1968) is a 71-item short form of the MMPI. It has items from all but two of the 13 scales of the MMPI, i.e. Mf and Si. It compares favorably with the full length version of the MMPI in producing similar two-point code types and the various scales correlate from .65 to .93 with the original scales. It was used to provide a broader index of personality functioning than any of the previously mentioned scales.

Following the conclusion of the stress induction, the subjects were asked to complete six semantic differential scales. These scales rated the mother's response to a number of aspects of the stressful stimulus (cry) in terms of its length, volume, irritability, anger, age of the child, and demanding dimensions.

Equipment

Skin conductance, heart rate, and finger blood volume were recorded by a Grass Instruments Model 79 Portable Polygraph equipped

with two low-level DC amplifiers. Gold electrodes were attached to the palmar surface of the nondominant hand. A rigid, finger plethysmograph oncometer was positioned on the middle finger of the nondominant hand, and was connected to a Statham pressure transducer into the polygraph. The attachment of the electrodes and plethysmograph was according to the suggestions of Venables and Martin (1967).

The stress stimulus was a 9 minute audiotape produced by the experimenter. It consisted of 9 discrete segments, the order of which was reversed for half of the subjects in each group. They were: 60 seconds of white noise, which was considered nonnoxious and nonthreatening; 60 seconds of a tone, which was considered noxious and nonthreatening; 60 seconds of white noise; 60 seconds of an infant cry, which was considered both noxious and threatening; 60 seconds of white noise; 60 seconds of tone; 60 seconds of white noise; 60 seconds of the cry; and 60 seconds of white noise. The intensity of the cry was matched to the tone and white noise (60 db measured at the headphones). However, the sound level peaked at 75 db for the cry.

Procedure

A biographical data sheet, the Group Embedded Figures Test, the Repression-Sensitization Scale, the MAACL, the Socialization Scale of the CPI, and the Mini-Mult were administered to each subject once they arrived.

The subject was escorted by the experimenter, who was blind to the group membership of the subjects, to a 10' x 10' dimly lit room and seated in a reclining chair. The experimenter informed the subject that the electrical activity of the skin and the heart rate would be

measured as she sat and listened to an audiotape. The experimenter then cleaned the surface of the skin with ethanol and attached two gold electrodes to the palmar surface of the nondominant hand. One electrode was placed on the pad below the index finger and the other directly across on the pad below the small finger. Electrode cream (EKG Sol), manufactured by Burton, Parsons, and Company, was the contact medium, and a velcro strap was used to hold the electrodes in place. The finger plethysmograph was then positioned on the middle finger. Subjects were reassured that the electrodes were for electrodermal measurement, and that no shock would be administered.

Subjects were informed that they were about to listen to an audiotape with various tones on it. In addition, they were asked to sit quietly, and told that the experimenter would be behind the one-way mirror recording the data. After being told that the tape would begin in a few minutes, the experimenter positioned the stereo headphones on the subject.

The experimenter recorded the subject's skin resistance (in K ohms, which were converted to conductance, micromhos and transformed logarithmically for data analysis), finger blood volume, and heart rate for a 7-minute baseline, after which the audiotape was started.

After the tape, the subjects completed the semantic differentials. The purpose of the experiment was then partially explained and each subject was provided with information regarding availability of the results. See Appendix V for a copy of the brief statement read to each mother at the conclusion of the study.

Data Analysis

One-way analyses of variance were used to measure whether differences existed between groups in terms of the demographic variables, field-dependence, repression-sensitization, depression, hostility, anxiety, socialization, the Mini-Mult scales, and the semantic differentials. Internal comparisons of group means was also performed using the Tukey test ($p < .05$).

Skin conductance, blood volume, and heart rate maxima were recorded for each 10 second interval for the baseline and the entire length of the audiotape. Both basal and phasic readings for skin conductance were recorded. Step-wise multiple regression analyses were performed to assess the relationship and interactions between group membership, field-dependence, socialization, depression, anxiety, hostility, and repression-sensitization to the skin conductance responses. This was repeated for heart rate and blood volume. The physiological and personality variables were also entered in step-wise discriminant analyses to determine whether group membership was significantly predicted.

Analysis of variance with repeated measures on the tone and cry segments was used to compare each group's psychophysiological responses to the various auditory stimuli.

The rapidity of habituation for each group was also determined. Finally, the interaction between heart rate and skin resistance in response to the cry was examined for each group.

CHAPTER III

RESULTS

Demographic Variables. Because three subjects failed to show for their appointments, data analyses were completed with unequal cell sizes, i.e. abusive mothers (N = 14), neglectful mothers (N = 13), and control mothers (N = 15), for a total sample size of 42. There were no significant differences across groups in the order of tape presentation, i.e. cry/tone vs. tone/cry, $\chi^2 (2) = .144$, n.s.

Key demographic variables were analyzed and the mothers did not significantly differ in Age, Education Level, and Mean Age of Children. The mothers did not differ in terms of Marital Status, $\chi^2 (8) = 7.71$, n.s., with over 71% of the mothers being either married (N = 14) or divorced (N = 16), or Income Level, $\chi^2 (12) = 13.21$, n.s., with slightly over two-thirds of the mothers (N = 28) indicating that their gross income was \$500 or less each month. The mothers did differ on one demographic variable, Total Number of Children, with abusive and neglectful mothers having a greater average number of children. See Table 1 for mean values of these variables.

Personality Variables. The personality variables were also analyzed across all three groups using one-way analysis of variance. See Table 2 for the results. Significant between-group differences ($p < .10$) were found on MAACL Anxiety, MAACL Hostility, the Socialization Scale from the CPI, the Group Embedded Figures Test, the Mini-Mult

Table 1
Mean Values of Key Demographic Variables

Variable	Abuse	Neglect	Control	F	P
1. Age of Mother	30.28	29.08	26.70	1.5	n.s.
2. Education Level	12.28	11.77	12.27	.33	n.s.
3. Total No. of Children	3.00	2.92	1.67	4.05	.02
4. Mean Age of Children	7.92	6.46	5.93	1.22	n.s.

Table 2

Mean Values of Personality Variables

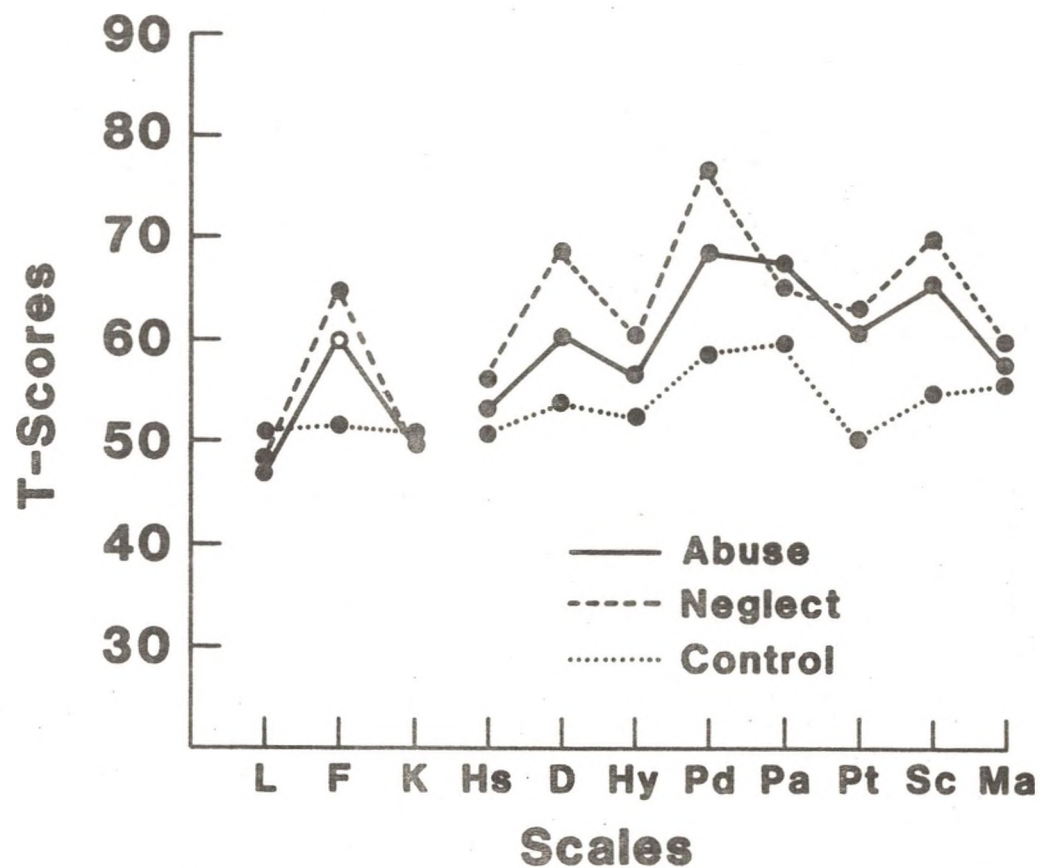
Variable	Abuse	Neglect	Control*	F	P
MAACL Anxiety	7.43	9.31	5.07	2.52	.09
MAACL Depression	11.93	15.85	9.40	2.11	n.s.
MAACL Hostility	6.78	8.92	5.07 ¹	3.02	.06
Repression-Sensitization	50.00	51.31	39.20	1.41	n.s.
Socialization	30.00	27.77	34.47 ¹	4.45	.01
Embedded Figures	5.64	5.46	9.87	3.84	.03
Mini Multi Scales					
L	3.28	3.84	4.4	1.79	n.s.
F	7.00	8.38	3.87	3.13	.05
K	12.57	12.92	13.33	.20	n.s.
Hs	14.43	15.92	13.60	.63	n.s.
D	24.50	28.31	21.47	2.81	.07
Hy	22.14	24.23	20.60	1.53	n.s.
Pd	26.88	29.71	22.20 ²	8.18	.001
Pa	13.71	12.77	11.00	2.10	n.s.
Pt	30.21	32.00	25.20	2.56	.09
Sc	31.43	33.85	26.00 ¹	3.46	.04
Ma	19.44	20.89	19.07	1.22	n.s.

*Internal comparisons were computed and are indicated in the following manner:

¹Control group differs from Neglect group ($p < .05$).

²Control group differs from Abuse and Neglect groups ($p < .05$).

PROFILE OF MINI-MULT MEAN SCORES



Scale, the Mini-Mult D Scale, Mini-Mult Pd Scale, The Mini-Mult Pt Scale, and the Mini Mult Sc Scale.

Internal comparisons were performed on those variables where significant F values resulted. Table 2 reports these findings. Mean differences between the control mothers and neglect mothers were noted for MAACL Hostility, CPI Socialization, and the Mini-Mult Sc Scale. Control mothers differed significantly from both neglect and abuse mothers on the Mini-Mult Pd Scale.

Cognitive Appraisal of the Cry. The mothers' rating of various subjective qualities of the cry on the audiotape were also analyzed. The mothers did not differ on the least subjective of these six variables, i.e. Length of Cry, Age of Child, and the Loudness of the Cry. However, significant differences occurred on the ratings of the three most subjective variables, i.e. Irritating, Angry, and Demanding. The control mothers rated the cry as the least angry, and were situated between the abusive and neglectful mothers in their ratings of how irritating the cry was and how demanding the child was, with the abusive mothers rating the cry as the least irritating and the least demanding. See Table 3 for the mean values of the semantic differential rating scales.

Internal post-hoc comparisons were also calculated on those variables which had significant F values. These findings clearly indicate that on the variables Irritating and Demanding, the control mothers fell between the extremes recorded for the abuse and neglect groups. For the variable Angry, the mean value for the control group was significantly less than the values for the abuse and neglect groups. These results are reported in Table 3.

Table 3
Mean Values of the Semantic Differential Rating Scales

Variable	Abuse	Neglect	Control*	F	P
1. Length of Cry	3.28	4.00	3.13	1.31	n.s.
2. Age of Child	4.43	5.15	4.80	.71	n.s.
3. Loudness	2.43	2.15	2.73	.88	n.s.
4. Irritating	2.86	4.31	3.60 ¹	3.20	.05
5. Angry	1.86	1.85	2.93 ²	5.45	.008
6. Demanding	2.93	1.77	2.53 ¹	3.20	.05

*Internal comparisons were computed and are indicated in the following manner:

¹Abuse group differs from Neglect group ($p < .05$).

²Control group differs from Abuse and Neglect groups ($p < .05$).

Psychophysiological Variables

Explanation of Data Analyses. Before reporting the results of the analyses on these variables, an explanation is needed of what each variable represents. The psychophysiological variables are essentially of three types, i.e. skin resistance, heart rate, and finger blood volume. Skin resistance is reported in three different ways, i.e. maximum and minimum skin resistance, deflection (which can be likened to momentary change), and total seconds above baseline (which can be likened to a steady-state). The maximum and minimum skin resistance were analyzed only for the baseline period, before the audio-tape began. The subjects' responses were being recorded by the polygraph for a hydration period and the seven minute baseline period allowed the researcher to calibrate the polygraph for the skin resistance for each subject. The baseline was established usually within the first 20-30 seconds and then for the rest of the baseline period, the subjects' normal fluctuations in skin resistance were recorded. The maximum reading equals the point of the subject's greatest deviation above the baseline. The minimum reading equals the point of the subject's greatest deviation below the baseline.

Deflection and Total Seconds Above the Baseline are the other two skin resistance measures that were analyzed. These measures were recorded only after the onset of the audiotape. Consequently, there are one of each of these measures for the five segments of white noise, the two segments of cry, and the two segments of tone. For example, White Noise 1 Deflection would indicate deflection on segment one of the white noise. Deflection was measured as the increase in skin resistance from the last ten seconds of the previous segment to the

first ten seconds of the next segment. Total Seconds Above Baseline was measured as the summation of all seconds (maximum = 60) in which the subject's skin resistance reading was above the baseline for the one minute segment in question.

The two cardiovascular measures were Heart Rate and Finger Blood Volume. One series of analyses were performed on the mean value of each of these measures for each one minute segment of the tape. A reading for each of these values was taken at ten second intervals. In addition, a second series of analyses were performed for each of these variables on the difference between the mean values for the baseline and the first segment of white noise, the baseline and the first cry segment, and the baseline and the first tone segment.

Data Analyses: ANOVA. A series of one-way analyses of variance were performed on the various physiological data. This was done with the awareness that the repeated measures aspect of this data would not be considered in some of these analyses. Results from repeated-measures ANOVA's are reported later in this section. Initially, between-group analyses were performed on the psychophysiological readings on the baseline to determine whether differences existed as a result of a different tape sequence. No significant differences were noted on Mean White Noise GSR Deflection, Mean Cry GSR Deflection, and Total Seconds Above Baseline. Analyses were then performed on the psychophysiological readings during the baseline period to determine whether differences existed between the groups before the audiotape began. No significant differences were noted on Maximum GSR level, Minimum GSR level, Mean Heart Rate, and Mean Finger Blood Volume.

White Noise Segments. Between-group analyses were then performed on psychophysiological measures recorded during the presentation of white noise. Significant differences on the first two of the White Noise segments, i.e. White Noise 1 Deflection and White Noise 2 Deflection were noted. No significant differences were formed on the remaining three segments of white noise, i.e. White Noise 3 Deflection, White Noise 4 Deflection, and White Noise 5 Deflection. In addition, Mean White Noise Deflection (for all five trials) was significantly different across groups ($F(2,39) = 3.88, p < .04$). Significant differences were noted on the measure Total Seconds Above Baseline for the last four segments of white noise, White Noise 2 Seconds Above Baseline, White Noise 3 Seconds Above Baseline, White Noise 4 Seconds Above Baseline, and White Noise 5 Seconds Above Baseline, but not for White Noise 1 Seconds Above Baseline. No significant differences were noted on any of the five white noise presentations for either heart rate or finger blood volume. See Table 4 for the results of these analyses.

Internal post-hoc comparisons with the Tukey ($p < .05$) were performed to further examine the white noise psychophysiological data. The control mothers differed from both the abuse and neglect mothers on the variable Seconds 4 Above Baseline. The control mothers differed from the neglect mothers on the variables Deflection 1, Deflection 2, Seconds 3 Above Baseline and Seconds 5 Above Baseline. See Table 4 for the results.

Cry Segments. Analyses were then performed on psychophysiological measures from the cry sequences. No significant between-group differences were noted on GSR Deflection in the two segments of cry, i.e. Cry

Table 4

Summary of Psychophysiological Measurements for White Noise Segments

	Abuse	Neglect	Control*	F (2,39)	P
Deflection 1	13.57	16.15	6.90 ¹	3.93	.03
Deflection 2	2.50	4.31	1.40 ¹	4.79	.01
Deflection 3	3.14	1.70	1.67	1.42	n.s.
Deflection 4	1.36	1.23	1.27	.02	n.s.
Deflection 5	1.21	.62	.60	1.14	n.s.
Seconds 1	38.36	45.08	26.20	2.04	n.s.
Seconds 2	25.14	42.15	19.60	2.65	.08
Seconds 3	29.57	40.77	9.47 ¹	6.05	.005
Seconds 4	31.00	40.62	6.20 ²	7.02	.002
Seconds 5	25.29	39.23	3.33 ¹	7.51	.002
FBV 1	66.10	62.06	63.33	.07	n.s.
FBV 2	68.32	59.53	61.72	.46	n.s.
FBV 3	68.68	59.46	66.49	.42	n.s.
FBV 4	65.81	62.87	69.52	.22	n.s.
FBV 5	70.87	61.97	72.10	.58	n.s.
HR 1	13.39	12.88	12.83	.52	n.s.
HR 2	13.54	12.79	13.02	.62	n.s.
HR 3	13.58	12.85	12.99	.56	n.s.
HR 4	13.38	12.65	13.03	.51	n.s.
HR 5	13.64	12.23	12.97	1.41	n.s.

*Internal comparisons were computed and are indicated in the following manner:

¹Control group differs from Neglect group ($p < .05$).

²Control group differs from Abuse and Neglect groups ($p < .05$).

1 Deflection, and Cry 2 Deflection. However, Mean Cry Deflection (for both trials) was significant ($F(2,39) = 2.47, p < .09$). Significant differences were noted on the measure Total Seconds Above Baseline for both segments of cry: Cry 1 Seconds Above Baseline and Cry 2 Seconds Above Baseline. No significant differences were noted on either of the cry presentations on either heart rate or finger blood volume. See Table 5 for the results of these analyses.

Internal comparisons for the psychophysiological data collected during the cry segments revealed one variable, Seconds 2 Above Baseline, for which the control group differed significantly from both the abuse and neglect groups. See Table 5 for the results.

Tone Segments. Analyses were then performed on the psychophysiological measures from the tone sequences. Significant differences were noted on GSR deflection in the two segments of tone, i.e. Tone 1 Deflection and Tone 2 Deflection. In addition, Mean Tone Deflection (for both trials) was significant ($F(2,39) = 5.46, p < .008$). Significant differences were also noted on the measure Total Seconds Above Baseline for both segments of tone: Tone 1 Seconds Above Baseline and Tone 2 Seconds Above Baseline. No significant differences were noted on either of the tone presentations for either heart rate or finger blood volume. See Table 6 for the results of these analyses.

Internal comparisons for the psychophysiological data on the tone variables revealed a significant difference between the neglect mothers and the control and abuse mothers on Deflection 1. Significant differences between the control mothers and the neglect mothers were noted for Seconds 1 Above Baseline and Seconds 2 Above Baseline. See Table 6 for the results.

Table 5
Summary of Psychophysiological Measurements for Cry Segments

	Abuse	Neglect	Control*	F (2,39)	P
Deflection 1	7.00	4.70	2.73	1.58	n.s.
Deflection 2	4.64	2.38	2.40	1.87	n.s.
Seconds 1	40.57	43.08	20.40	3.35	.04
Seconds 2	31.86	41.54	8.53 ¹	6.22	.004
FBV 1	72.18	62.59	65.48	.45	n.s.
FBV 2	78.43	62.01	71.63	1.22	n.s.
HR 1	13.57	12.79	12.89	.68	n.s.
HR 2	13.48	12.73	13.13	.48	n.s.

*Internal Comparisons were computed and are indicated in the following manner:

¹Control group differs from Abuse and Neglect groups ($p < .05$).

Table 6
Summary of Psychophysiological Measurements for Tone Segments

	Abuse	Neglect	Control*	F (2,39)	P
Deflection 1	3.21	7.77	1.33 ²	8.78	.0007
Deflection 2	3.14	5.54	.73	2.76	.07
Seconds 1	29.07	41.08	13.47 ¹	4.42	.02
Seconds 2	26.86	38.62	10.40 ¹	4.19	.02
FBV 1	66.32	59.08	66.09	.35	n.s.
FBV 2	72.98	62.18	70.44	.60	n.s.
HR 1	13.54	12.72	12.97	.71	n.s.
HR 2	13.36	12.73	13.02	.36	n.s.

*Internal comparisons were computed and are indicated in the following manner:

¹Control group differs from the Neglect group ($p < .05$).

²Neglect group differs from Abuse and Control groups ($p < .05$).

A 3 (mother category) x 2 (tape order: cry/tone, tone/cry) x 2 (signal: tone, cry) repeated measures analysis of variance was performed on the psychophysiological responses and elaborated the findings of the one-way analyses reported earlier. Again, no differences were noted on heart rate or finger blood volume. However, highly significant effects were noted for segments on skin conductance deflection, suggesting greater autonomic arousal to the cry segments, as opposed to tone ($F(4,163) = 6.97, p < .001$). No significant effects on deflection were noted with regards to order of presentation, however (whether cry or tone came first on the tape) ($F(3,164) = 1.64, n.s.$). No significant effect was noted for segments on Seconds Above Baseline, suggesting that there was no difference in ability to habituate for either tone or cry ($F(4,163) = .84, n.s.$). However, a significant effect on Seconds Above Baseline was noted with regard to order of presentation of the segments ($F(3,164) = 9.27, p < .003$), which indicated that when cry was the first segment, habituation was more difficult.

A single measure of overall arousal and ability to habituate was computed by summing the total seconds above baseline for each of the nine segments, with a possible range of 0 to 540 seconds. A significant between groups difference was obtained ($F(2,39) = 6.04, p < .005$), with the mean values ranging from 117.6 seconds for the control mothers, to 277.7 seconds for the abusive mothers and 372.2 seconds for the neglectful mothers. Internal comparisons revealed a significant difference only between the control mothers and the neglect mothers ($p < .05$).

Analyses were also performed on various change scores that were computed to determine to what extent change occurred from the baseline with the onset of white noise, cry, and tone. No significant differences were noted with the onset of white noise for either heart rate ($F(2,39) = 2.02$, n.s.) or finger blood volume ($F(2,39) = .30$, n.s.), nor with the onset of the cry for either heart rate ($F(2,39) = 1.20$, n.s.) or finger blood volume ($F(2,39) = .19$, n.s.), nor with the onset of the tone for either heart rate ($F(2,39) = .81$, n.s.) or finger blood volume ($F(2,39) = .16$, n.s.).

Discriminant Analyses. A series of step-wise discriminant analyses were performed to determine what combination of personality and psychophysiological variables most accurately predicted group membership. The first analysis included all Mini-Mult variables with the three groups of mothers and revealed two significant discriminant functions, $\chi^2(8) = 21.74$, $p < .005$ and $\chi^2(3) = 7.50$, $p < .05$. Results from this analysis are presented in Table 7. Inspection of this table reveals that the stepwise procedure selected four variables as contributing to the optimal discrimination of groups. These included Pd, Pa, L, and D. None of these variables were removed by subsequent stepwise procedures. The first discriminant function was defined primarily by the Pd Scale for the Mini-Mult and the second discriminant function was defined primarily by the Pa Scale. Table 7 also contains centroids for the three groups. These values represent the mean discriminant scores for each group on the two functions. Thus, they provide a summary of group location defined by that function. This analysis correctly classified 50.0% of the abusive mothers, 69.2% of the neglectful mothers, and 60% of the control mothers for an overall correct

Table 7

Summary of Stepwise Discriminant Analysis on all Mini-Mult Scales

Step no.	Variable Entered	F to Enter	Wilks's lambda	p
1.	Pd	8.18	.704	.001
2.	Pa	4.53	.652	.002
3.	L	3.53	.604	.004
4.	D	3.03	.560	.006

Canonical Discriminant Functions

Function	Eigenvalue	Canonical r	χ^2 (df)	p
1	.462	.562	21.74(8)	.005
2	.221	.426	7.50(3)	.05

Group Centroids

	Function 1	Function 2
Abuse	-.06	.64
Neglect	-.88	-.36
Control	.82	-.29

classification of 59.5%. This is contrasted to a prior probability for each group of 33.3%, and is highly significant, $\chi^2 = 14.30$ (6), $p < .01$).

The second discriminant analysis included the three scales from the MAACL, i.e. Anxiety, Hostility, and Depression, Repression-Sensitization, Socialization, and Field-Dependence. This analysis resulted in one discriminant function, $\chi^2(6) = 16.45$, $p < .012$. Results from this analysis are presented in Table 8. Inspection of this table reveals that the stepwise procedure selected three variables as contributing to the discriminant analysis. These were MAACL Anxiety, Socialization, and Field-Dependence. The discriminant function was defined primarily by field dependence. This analysis correctly classified 50% of the abusive mothers, 53.8% of the neglectful mothers, and 73.3% of the control mothers, for an overall correct classification of 59.5%. This classification was significant $\chi^2(16) = 14.95$, $p < .005$.

The mother's ratings of the cry on the audiotape were also entered in a discriminant analysis. Results of this analysis are presented in Table 9. Two significant discriminant functions resulted, $\chi^2(6) = 17.68$, $p < .007$ and $\chi^2(2) = 8.01$, $p < .02$. Three of the ratings were included in the stepwise analysis, Irritating, Angry, and Demanding. This analysis correctly classified 64.3% of the abusive mothers, 61.5% of the neglectful mothers, and 53.3% of the control mothers for an overall correct classification of 59.2%. This classification was also significant, $\chi^2(6) = 11.50$, $p < .02$.

Psychophysiological variables were entered in a discriminant analysis. Results of this analysis are presented in Table 10. Two significant discriminant functions resulted, $\chi^2(6) = 20.60$, $p < .002$

Table 8

Summary of Stepwise Discriminant Analysis on Other Personality Variables

Step No.	Variable Entered	\underline{F} to Enter	Wilks's lambda	p
1.	Socialization	4.45	.814	.02
2.	Field-Dependence	3.74	.700	.008
3.	MAACL Anxiety	2.98	.648	.01

Canonical Discriminant Functions

Function	Eigenvalue	Canonical r	$\chi^2(df)$	p
1	.524	.586	16.48(6)	.012
2	.011	.106	.428(2)	n.s.

Group Centroids

	Function 1	Function 2
Abuse	-.32	-.14
Neglect	-.71	.11
Control	.91	.03

Table 9

Summary of Stepwise Discriminant Analysis on Mother's Ratings of Cry

Step No.	Variable Entered	F to Enter	Wilks's lambda	p
1.	Angry	5.45	.781	.008
2.	Irritating	4.21	.671	.004
3.	Demanding	3.23	.628	.007

Canonical Discriminant Functions

Function	Eigenvalue	Canonical r	$\chi^2(df)$	p
1	.290	.474	17.68(6)	.007
2	.235	.436	8.01(2)	.018

Group Centroids

	Function 1	Function 2
Abuse	-.47	-.50
Neglect	-.28	.65
Control	.69	-.09

Table 10
Summary of Stepwise Discriminant Analysis
on Psychophysiological Variables

Step No.	Variable Entered	F to Enter	Wilks's lambda	p
1.	Seconds Above Baseline	6.04	.763	.005
2.	Mean Tone Deflection	4.15	.674	.004
3.	Mean Cry Deflection	3.84	.582	.002

Canonical Discriminant Functions

Function	Eigenvalue	Canonical r	χ^2 (df)	p
1	.512	.582	20.60(6)	.002
2	.137	.347	4.88(2)	.09

Group Centroids

	Function 1	Function 2
Abuse	.13	.50
Neglect	-.96	-.18
Control	.71	-.30

and $\chi^2(2) = 4.88$, $p < .09$. The stepwise procedure selected three variables as contributing to the optimal discrimination. These were Total Time Above Baseline (GSR), Mean Overall Deflection for Tone, and Mean Overall Deflection for Cry. The first function was primarily defined by Total Seconds Above Baseline whereas the second function was largely defined by Mean Overall Deflection for Cry. The discrimination correctly classified 38.6% of the abusive mothers, 61.5% of the neglectful mothers, and 80.0% of the control mothers for an overall correct classification of 57.1%. This classification was significant, $\chi^2(4) = 15.10$, $p < .005$.

Key personality and psychophysiological variables were then entered in a stepwise discriminant analysis. Results of this analysis are presented in Table 11. Two significant discriminant functions resulted, $\chi^2(16) = 41.76$, $p < .0004$ and $\chi^2(7) = 12.07$, $p < .09$. Eight of the seventeen variables introduced were included in the stepwise analysis in the following order: Mini-Mult Pd Scale, Total Seconds Above Baseline, Irritating (from the semantic differential), Angry (from the semantic differential), Mini-Mult F Scale, Mean Tone GSR Deflection, Demanding (from the semantic differential), and MAACL Hostility. The first discriminant function was defined primarily by the Pd scale and the second by Demanding. This analysis was the most successful and correctly classified 78.6% of the abusive mothers, 76.9% of the neglectful mothers, and 80.0% of the control mothers, for an overall correct classification of 78.6%. This classification was significant, $\chi^2(4) = 28.85$, $p < .005$.

Multiple Regression Analyses. A series of stepwise multiple regression analyses were then performed to determine what variable(s)

Table 11

Summary of Stepwise Discriminant Analysis on all Mini-Mult Scales

Step No.	Variable Entered	F to Enter	Wilks's lambda	p
1.	Pd Scale	8.18	.704	.001
2.	Seconds Above Baseline	6.51	.555	.0001
3.	Irritating	5.68	.468	.0001
4.	Angry	4.96	.415	.0001
5.	F Scale	4.27	.386	.0001
6.	Mean Tone Deflection	3.82	.356	.0002
7.	Demanding	3.52	.328	.0003
8.	MAACL Hostility	3.20	.308	.0005

Canonical Discriminant Functions

Function	Eigenvalues	Canonical r	$\chi^2(df)$	p
1	1.31	.753	41.76(16)	.0004
2	.405	.537	12.07(7)	.09

Group Centroids

	Function 1	Function 2
Abuse	-.26	.85
Neglect	-1.30	-.56
Control	1.37	-.31

accounted for the most variance in predicting the psychophysiological responses of the mothers (only skin conductance variables were examined since heart rate and finger blood volume did not differ across groups). Eleven significant personality variables and two other variables, i.e. group membership and order of sounds on the tape were entered into analyses for each of the following: Total Seconds Above Baseline, Mean Deflection on White Noise, Mean Deflection on Tone, and Mean Deflection on Cry. Total Seconds Above Baseline was predicted with significant contributions by two variables, field dependence (from the Group Embedded Figures Test) and the F Scale from the Mini-Mult, $F(2,39) = 16.98$, $p < .01$, $R^2 = .46$, and resulted in the following regression: $Y^1 = 303.45 - 20.61 (\text{Field Dependence}) + 14.66 (\text{F Scale})$. Mean Deflection on White Noise was predicted with a significant contribution from one variable, MAACL Hostility, $F(1,40) = 6.76$, $p < .05$, $R^2 = .14$, and resulted in the following regression equation: $Y^1 = 2.20 + .2323 (\text{MAACL Hostility})$. Mean Deflection on Cry was predicted with a significant contribution from one variable, field dependence, $F(1,40) = 6.56$, $p < .05$, $R^2 = .14$, and resulted in the following regression equation: $Y^1 = 6.10 - .3030 (\text{Field Dependence})$. Mean Deflection on Tone was predicted with significant contributions by three variables, the F Scale for the Mini-Mult, MAACL Hostility, and the Hy Scale from the Mini-Mult, $F(3,38) = 9.76$, $p < .01$, $R^2 = .44$, and resulted in the following regression equation: $Y^1 = 3.31 + .5239 (\text{F Scale}) + .4450 (\text{MAACL Hostility}) - .2773 (\text{Hy Scale})$. Neither group membership or tape order were significant predictors of any of these skin conductance measures.

CHAPTER IV

DISCUSSION

The question now becomes how the results of this study add to the body of literature concerning the personality characteristics of child maltreators. A number of questions need to be examined. To what extent do these findings support and add to previous research? Are there any differences in subject variables that limit the validity of the findings? Along what dimensions can abusive parents be discriminated from neglectful parents? Finally, are there any interventions that follow from these findings? Each of these questions will be examined in this section.

Subject Variables. The conclusions that can be drawn from this study are strengthened by the fact that the groups of mothers are similar on all but one demographic variable, Total Number of Children, with abusive and neglectful mothers having more children. In addition, the groups of mothers did not differ on any psychophysiological measures recorded during the baseline. Finally, the groups of mothers in this study were compared on essentially three groups of different measures: psychophysiological, standard personality variables, and cognitive appraisal, each of which can tap different pools of variance.

It is possible that the variable, Total Number of Children, which was the one demographic variable that differed between groups, is a meaningful difference. The implications of this variable need to be

examined. Both maltreating groups had an average number of children greater than the control mothers, with the former two groups averaging about three children, and the control mothers approaching two children each. The presence of another child could add additional economic stress, demand greater parental responsibility, create more noise and contribute to increased sibling rivalries. Hence, the stress level could be considerably more in larger families. Stress has been implicated as an etiological factor in child maltreatment, and is a necessary but insufficient factor. Gaines, et al. (1978) and Friedrich and Boriskin (1976b) have described the multiple components that enter into child abuse and neglect and have suggested that stress is a significant factor in the equation. At the same time, child variables, personality variables, and coping styles are also of considerable importance. Gaines, et al. (1978) have pointed out that the ability to cope with stress may be the crucial factor that discriminates abusive and neglectful mothers from non-abusive, non-neglectful mothers. Hence, stress per se may not be the critical variable, but it is possible that the extra stress of an additional child would account to some degree for the findings of this study. In a future study, it would be worthwhile to control for this variable more carefully.

Before examining the personality differences that were found to exist between these groups of mothers, it is necessary to examine the possibility that these group differences reflected in part the mother's reactions to being caught and labeled as abusive or neglectful mothers. Wright's (1970; 1976) studies have suggested that this labeling process affected their parents' response set. It is possible that some of these differences are secondary to public discovery, rather than being primary

and perhaps causal differences. In addition, these mothers may have had some reaction, e.g. guilt, to their commission of this act and their detection which mediates the results. The investigator attempted to keep these influences to a minimum in several ways. First, the mothers were contacted via channels completely separate from the county welfare agency. Most of the mothers accepted the invitation to participate and earn \$10 without question. Those that did question the motives of the study appeared to be satisfied that it was part of a research study leading to an advanced degree and that they were one of many mothers who were participating. Secondly, none of the research instruments were related specifically to child-rearing, with the possible exception of the semantic differential, which was administered at the very end of the study, after the other scales and after the audiotape. However, even though the mean profile on the validity scales of the Mini-Mult did not suggest undue defensiveness, it is important that this factor be considered when examining the results of this study.

Personality Variables. The interpretation and generalizability of these findings is limited because of the small sample size. Although the groups were similar on subject variables, the sample sizes need to be considered. The groups of mothers differed on a number of personality variables. With respect to the maltreating parents, the control group was found to be less anxious, less hostile, more socialized, and less field-dependent. In addition, they reported less stress and emotional pain, were not as depressed, were less angry and impulsive, and reported fewer bizarre thoughts and experiences. On the other hand, the neglectful mothers were clearly the most pathological of the three groups, occupying the extremes on most measures and can be characterized as the

most hostile, impulsive, under the most stress, and the least socialized. Although the direct comparison of Mini-Mult profiles and code-types to full scale MMPI code-types is of undetermined validity, an examination of Figure 1 indicates that neglectful mothers attained an average profile of the spike-4 variety, in which the Pd scale is the only scale elevated above 70. Individuals that achieve this profile are most frequently described as impulsive and have a history of difficult interpersonal relations. This profile is somewhat similar to the Pd-Ma profile for abusive females reported by Paulson, et al. (1974) and the Pd-Sc profile for abusive females reported by Wright (1970) and Kaleita and Wise (1976). Failure to find differences between groups on either the L or K scales also suggest that the defensiveness tapped by Wright (1970, 1976) was not apparent in these groups.

Although significant differences existed on the measure of field dependence provided by the Group Embedded Figures Test, the mean scores (Abuse = 5.64, Neglect = 5.46, Control = 9.87) for the abusive and neglectful mothers are in the lowest quartile and the control mothers' mean score places them just inside the second quartile (Witkin, Oltman, Raskin, & Karp 1971). This suggests that the latter group is somewhat less field dependent than either the abuse or neglect group. The importance of this difference is difficult to determine, except that there is some evidence of a higher prevalence of psychopathology at the extremes of the field dependence-field independence dimension than in the middle range (Witkin, Oltman, Raskin, & Karp 1971). Witkin, et al. (1971) reported that the personality disturbances shown by field dependent persons are suggestive of deepseated dependency problems, poorly developed controls, and passivity and helplessness.

Significant differences were also found on the Socialization scale from the California Psychological Inventory. Again, the control mothers were the most socialized, followed by the abusive mothers, and then the neglectful mothers. This finding again suggests greater pathology in the neglectful mothers, in that poorly socialized individuals are characterized by interpersonal conflict, impulsivity, and superficial interpersonal relationships.

These personality measures were successful in significantly discriminating between the three groups. The Pd Scale for the Mini-Mult and the Socialization Scale for the CPI were the two most important variables in the discriminant procedures, again underlining the fact that measureable interpersonal difficulties are of paramount importance in maltreating mothers.

Mothers' Assessment of the Stimulus Tape. In addition to the standardized personality measures, it was also deemed necessary to examine more specifically the way mothers might cognitively process their interactions with the children in their care. The literature increasingly suggests that maltreating mothers have adopted a response pattern or a cognitive set as a result of transactions with their children. Characteristics of the child, coupled with the parents' incompetence, combine to form a self-defeating and escalating cycle which leaves both parent and child emotionally unsatisfied (Friedrich & Boriskin 1976b).

A recent study indicated that abusers typically found child-related contexts and child-related activities aversive (Disbrow, Doerr, & Caulfield 1977). It appeared that abusers had a cognitive set which resulted in most child behaviors being viewed as aversive. In the

present study, the nature of this cognitive set was tapped through the mothers' ratings on six dimensions of the cry segment on the audiotape. No significant differences existed between groups on the least subjective aspects of the cry, i.e. Age of Child, Length of Cry, and Loudness of the Cry. These three variables were designed so that there would be little question about the correct answer. For example, the cry segment was for 60 seconds, it was done by a child that was clearly 2-4 months old, and the cry was quite loud. The significant differences came on the more subjective dimensions, i.e. Irritating, Angry, and Demanding, wherein more subjective and projective components of the mothers' cognitive set or labeling process was more likely to be in operation. An infant's cry that lasts for 60 seconds can be somewhat irritating, and since this was the cry of an infant in distress, there was also a demanding aspect to it. However, describing a 2-4 month old infant in distress as angry suggests some personalization in operation. The results indicated that the control mothers were inbetween the other mothers in their ratings on Irritating and Demanding, and described the child as the least angry of any of the three groups. The abusive mothers did not differ from the neglectful mothers in their ratings on Angry, rating the cry as significantly more angry than the control mothers. However, the abusive mothers as a group rated the cry as the least irritating and least demanding, whereas the neglectful mothers rated the cry as the most irritating and demanding. One interpretation of this is that the abusive mothers repressed the realistically noxious aspects of the cry and the neglectful mothers exaggerated these aspects, with both groups rating the infant's cry as angry. The control mothers' inbetween position on Irritating and Demanding suggests that they may

be more realistic in their processing of this information. The particular set that parents have about their child seems related to the dimension Egeland and Brunnequell (1979) describe as the mother's ability to understand the psychological complexity of the infant. Some mothers are less able to understand their child's complexity, and this may be due to their being somewhat inflexible in their interpretation of their child's behavior.

Psychophysiological Variables. When this study was formulated, three separate and frequently noncorrelated psychophysiological measures of arousal and openness to stimuli were chosen; skin conductance, heart rate, and finger blood volume. Of the three variables, skin conductance is the most closely and directly related to arousal in response to stress. Heart rate and finger blood volume are more related to a "response set" involving mental concentration. Skin conductance was analyzed in two ways: deflection upon the onset of an auditory stimulus and total seconds above baseline for each 60 second period. Both of these measures are related quite closely to the extent to which a subject habituates to the stimuli and becomes progressively less aroused with each additional presentation of the stimulus. In addition, the fractionation response described by Lacey (1967) which revealed that some individuals are open to their environment and others tend to reject it, was also examined, to determine whether the various groups differed in their response to the stimuli.

The results were quite straightforward. There were no significant differences on heart rate or finger blood volume between groups for any of the segments of the audiotape. This was supported by the repeated measures analyses. In addition, change scores to measure to what

extent the mothers responded in either an acceleratory or deceleratory fashion to either of the initial presentations for white noise, cry, or tone with respect to their baseline recordings of heart rate and finger blood volume were not significant. The failure to find significant differences in heart rate change scores suggests that the groups of mothers did not differ in their response to the stress stimuli. Mild arousal on heart rate was noted for each group with each presentation. Change scores in finger blood volume, or peripheral vasoconstriction, also did not differ between groups. This variable is a general index of arousal, and has been related in some research to hostility and aggression (Ax 1970). Based on Lacey's formulation, it could have been predicted that maltreating mothers would respond uniformly with acceleration of heart rate across all segments of the audiotape and control mothers would become aroused (increased heart rate) for the cry segments, but decelerate with the other, less noxious stimuli. However, in this study, all three groups responded with moderate heart rate acceleration, which does not support Lacey's formulation.

Skin conductance has been widely used to indicate arousal and, while considerably complex, is often interpreted somewhat more directly. Some interesting and quite different responses were noted between groups. In response to white noise, which was viewed as nonnoxious and non-threatening, significant between group differences were noted on the first two of a total of five deflections, with the control mothers having the least deflection or initial arousal and the neglectful mothers indicating the greatest initial arousal. These differences dropped out with the third presentation, suggesting that a habituation process was operating. However, another dimension of habituation, i.e.

seconds above baseline, showed a different pattern, in that no significant differences existed on the first presentation, but for the remaining four presentations of white noise, both abusive and neglectful mothers remained relatively near their initial time above baseline, whereas control mothers dropped off considerably, remaining above the baseline on the final segment for a mean of 3.33 seconds, compared to 39.23 seconds and 25.29 seconds for the neglectful and abusive mothers, respectively. How much of this elevation was an additive effect of the previous stimulus presentations is uncertain. Seconds above baseline does provide an alternative measure of the habituation response seen in the deflection score. As mentioned earlier, it describes a more steady-state phenomenon than the momentary differences reflected in the Deflection score. What appears to have occurred is that the two groups of maltreating mothers showed much more initial arousal, or greater momentary differences, as indicated by significant differences on GSR deflection, and failed to habituate, or at least to return to the pre-arousal baseline, whereas the control mothers showed some of the same initial arousal, but yet were able, through some process, to relax and return to a normal, resting state.

An analysis of the responses to the two segments of cry also revealed some significant differences between groups on the skin conductance responses. No significant differences were noted on deflection for either cry segment, suggesting that all three groups were aroused by the sound of the infant's cry. An examination of the mean values for deflection in Table 5 indicate that the trend existed for the abusive mothers to have the highest mean deflection on these segments. Although deflection values were not significantly different,

the seconds above baseline were highly significant. The abusive and neglectful mothers habituated only slightly from the first segment to the next, and the control mothers, who were significantly lower than either group on the first segment, increased this margin with the second presentation of the cry stimulus. It appears that the cry segment elicited arousal (as measured by deflection) from all three groups of mothers, but that the control mothers were able to habituate or relax in the face of this stimulus, a capacity that was not demonstrated by either the neglectful or abusive mothers. With these latter two groups of mothers, there also appeared to be some difference in their response styles, with the abusive mothers becoming more aroused but being able to habituate somewhat better than the neglectful mothers, who appeared to remain at a heightened level of arousal.

The tone segments were included in the audiotape in order to provide a comparison with the cry segments. The tone was intended to be noxious, but not as personally threatening as the cry. Again, the results on skin conductance revealed significant differences between groups. In addition, the pattern of responses for the tone segment was different than the pattern revealed on the two cry segments. On the measure of initial arousal (deflection), significant differences were obtained. For the tone, the neglectful mothers were the most aroused, with both the abusive and control mothers clustered at a considerably lower level of initial arousal. The neglectful mothers appeared to be more aroused (in absolute values) by the tone than the cry, which was not the case for the other two groups. These latter two groups of mothers responded with greater arousal to the cry. In terms of habituation (seconds above the baseline), significant differences between

groups were noted on both segments, with the neglectful mothers having the most difficulty habituating, followed by the abusive mothers, and then by the control mothers. Again, the maltreating mothers demonstrated a pattern of remaining for prolonged periods at a heightened level of arousal.

In general, a number of different psychophysiological measures of arousability and habituation indicate that control mothers as a group tend to be less arousable and habituate more quickly than either abusive or neglectful mothers. Although the three groups of mothers did not differ significantly on two much more specific measures of arousal, i.e. heart rate and finger blood volume, the results provided by the skin resistance measures are quite interesting. For example, although no between-group differences were noted for Deflection in response to either cry segment, suggesting that while all three groups were aroused by the onset of the cry, the control mothers as a group were significantly more efficient at relaxing, or returning to a steady-state, after this initial arousal. Arousal in response to a cry is a completely normal response in mothers, because as Murray (1979) has indicated, the infant's cry is an activator of parental behavior. But the ability to habituate or relax in the face of a cry is also adaptive, because it enables a caregiver to better tolerate the provoking and irritating aspects of infant crying and continue to offer adequate care.

The mothers' responses to the tone stimulus was also quite interesting. The results seemed to suggest that neglectful mothers responded similarly to both the tone and the cry, while both abusive and control mothers were less aroused by the tone than by the cry. The

reader can speculate whether neglectful mothers are more generally aroused by a larger variety of environmental stimuli than non-neglectful mothers. Consequently, they become overwhelmed more easily and need to withdraw. This would certainly fit their reported behavior (Polansky, et al. 1979), in that neglectful mothers isolate themselves and withdraw from social situations and stimuli.

A cognitive set or fractionation response was not found for the cardiovascular measures. However, when the skin conductance measures were submitted to a step-wise multiple regression, field independence was the single-best predictor of Total Seconds Above Baseline and Mean Deflection on Cry. Mean Deflection on White Noise and Mean Deflection on Tone were predicted by MAACL Hostility and the F Scale, and MAACL Hostility and the Hy Scale, respectively. Since field-dependence is related to a cognitive set it may be worthwhile exploring this. All three groups could be considered field-dependent, although the control mothers differed significantly from the other groups of mothers in being less field dependent. Extremely field-dependent individuals "turn against the self" and tend to personalize external events much more than field-independent individuals (Witkin & Goodenough 1977). This raises the possibility, which certainly needs to be examined more vigorously, that both groups of maltreating mothers' difficulties in distancing themselves from the audiotape contributed to their failure to habituate as rapidly as the control mothers. The other two skin conductance measures were predicted by measures reflecting anger, impulsivity, and in the case of the Hy scale, a measure of repression, which is a defensive operation.

Multiple Measures of Functioning. The present study was designed to sample from several areas of functioning, i.e. psychophysiological, personality, and cognitive labeling. This decision was made with the expectation that this diverse sampling would result in a greater amount of variance being accounted for, and would also contribute to a greater discriminatory ability. An examination of the discriminant analysis using key variables from these three groups of variables gives some indication of the dimensionality of the data. The first three variables entered in the step-wise discriminant analysis bear out the importance of sampling from diverse areas of functioning. The first step included the Mini-Mult Pd Scale, which taps impulsivity, anger, and acting out. The second step included the measure Total Seconds Above Baseline, which is a measure of psychophysiological habituation. The third step was the variable Irritating, from the semantic differential rating of the infant's cry. This particular combination of variables predicted group membership with approximately 20% more overall accuracy than any of the other discriminant analyses which did not include as wide a sampling of variables, for a hit rate approaching 80%. This discriminant analysis was more successful primarily in differentiating abusive from neglectful mothers, which was a primary failing on the part of the other discriminant analyses that were performed using other sets of variables.

These findings suggest that maltreating mothers are not a homogenous group. Abusive mothers have not been contrasted often with neglectful mothers, but in one study that did, neglectful mothers differed from abusive and control mothers along two MSPP factors, i.e. Emotional Needs Met and Coping, with neglectful mothers appearing as the least healthy on these two measures (Gaines, et al. 1978). Neglectful

mothers were also the least healthy in this study, occupying the extreme positions on practically every personality and psychophysiological measure that differed between groups. They had even less ability to habituate to the auditory stimuli than the abusive mothers, and responded with greater arousal to all stimuli, except for the cry, which triggered the abusive mothers more than the neglectful mothers. It is possible to hypothesize that the greater personality difficulties of neglectful mothers and their difficulty habituating to stressful stimuli contributes to the pervasive maltreatment that characterizes their behavior. The abusive mothers' behavior seems much more situation specific, i.e. their greatest arousal was to the cry, and this could be seen as contributing to their more episodic outbursts against their children. Passman and Mulhern (1977) have addressed this issue of the cumulative effects of stress on the mother in their analogue research on precipitants to child abuse. They demonstrated that external response requirements on the part of the mother (dealing with day-to-day circumstances), when coupled with irritating aspects of the child's behavior, were directly related to the degree of maternal punitiveness. Further research could address whether abusive and neglectful mothers actually differ along these dimensions. This may account, in part, for the different types of maltreatment.

Differences Between Maltreating and Control Mothers. It is important at this time to summarize the critical differences between these groups of mothers as suggested by this study. The results support the literature contentions that maltreating mothers as a group are more angry, more impulsive, have a greater number of interpersonal difficulties, and can be differentiated from low income control mothers in a

number of significant ways. In addition, it suggests that it is not valid to view abusive and neglectful mothers as being homogenous. This contention was demonstrated most clearly with the results of the internal comparisons using the Tukey. Rather, the evidence suggests that neglectful mothers, as a group, are more dysfunctional than abusive mothers, and are less socialized, more angry, more impulsive, more easily aroused, and have greater difficulty habituating to stressful and nonstressful stimuli. Abusive mothers, as a group, appear to fall somewhere between neglectful and low-income control mothers on measures of personality functioning. In addition, the psychophysiological data suggests that abusive mothers are more capable than neglectful mothers to discriminate stressful stimuli from nonstressful stimuli, i.e. cry vs. tone. Of particular importance in differentiating these three groups of mothers was their performance on the semantic differential. For example, both groups of maltreating mothers labelled the infant as significantly more angry than the control mothers. However, the abusive mothers appeared the most impervious to the demanding and irritating aspects of the cry while the neglectful mothers emphasized these aspects. The clinical picture of the neglectful mother as overwhelmed (Polansky, et al. 1979) by her circumstances can be seen to be possibly related to these findings. It does appear that this small group of low-income control mothers, who were of similar socioeconomic, education, and marital status, revealed significantly less anger, hostility, impulsivity, a greater degree of socialization and hence better interpersonal relations, and a more appropriate manner of dealing with stressful and nonstressful stimuli than either group of maltreating mothers. This finding certainly emphasizes the need to

determine what it is about some parents, who are under stress, to continue to perform adequately as parents.

Suggestions for Intervention. The question that now arises is whether intervention is possible, and whether results of this study provide any clues to desirable intervention directions. Intervention in the maltreating cycle is certainly highly desirable, and this study suggests that one appropriate avenue might be to alter maltreating parents' cognitive appraisals of their child's behavior. Although data were not systematically gathered, it became obvious that some of the mothers became very threatened by the audiotape. They would comment at its conclusion that "what are you trying to do to my head?," "do you want to drive me crazy?," "that cry was awful, it seemed to go on forever," "what a mean baby," and similar statements. Other mothers reported that they were able to tell themselves it was only a tape recording and would soon be over. Maltreating mothers, as demonstrated by their ratings of the cry, may tend to personalize and over-react.

It could be suggested, at least for this narrowly defined set of children's behavior, i.e. an infant's cry, that they have a cognitive set about this behavior which results in it being aversive and personally threatening. This suggests that they could be helped by altering their cognitive set about their children's behavior, so that they were not as personally threatened. This is not to give short shrift to their other personality difficulties, particularly their interpersonal difficulties which make it difficult for them to engage in appropriate help-seeking behavior. These are multi-problem families and a variety of interventions are needed. However, it is an intervention with a specific

focus, and could be a component of their therapy. A future avenue of research would be to repeat this study and give a random sample of the maltreating mothers assistance with handling their arousal to the stimuli. This could be done through cognitive behavioral means using thought stopping, imagery, or stress inoculation. (There is one report in the literature about using systematic desensitization successfully with an abusive father [Sanders 1978]). It could be determined whether this intervention was effective in reducing arousal and facilitating habituation when compared with a no-treatment group. And that is the goal of clinical research--to lead to appropriate intervention.

In summary, the results of this study, although somewhat tentative due to the small sample size, support the literature findings of greater overall personal disturbance in abusive and neglectful mothers, with neglectful mothers appearing the most disturbed of the three groups. In addition, it adds to the clinical impressions that maltreating mothers view their child's behavior as more aversive than do control mothers. Possibly of more importance, this is the first reported study to compare the psychophysiological responses of maltreating and control mothers in response to various stressful and nonstressful stimuli. These psychophysiological results again suggest that maltreating mothers seem to differ from control mothers in the degree and extent of arousal, becoming more aroused and staying aroused longer than the control mothers. This finding in no way proves that maltreating parents' greater arousability and difficulty in habituating is a causal mechanism in the maltreatment cycle. It does, however, strongly suggest the need for further research which examines psychophysiological responses in these mothers in more natural settings.

APPENDIX I

LETTER TO MOTHERS

The University of North Dakota

GRAND FORKS 58201

DEPARTMENT OF PSYCHOLOGY

TELEPHONE: (701) 777 3451

June 24, 1979

Dear

I am working on my doctoral dissertation and am studying the different ideas and problems parents have concerning their children. I would like you to take part in a study that looks at those ideas. Parents from all across Grand Forks will be taking part in the study and you are one that is being invited.

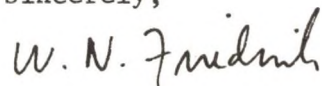
The study will take place at the University (see enclosed map). It will take about one hour, and you will be receiving \$10.00 for your time. You will fill out some questionnaires and listen to a tape recording of children's sounds.

This study is conducted through the University, and is not related to any agency in this town. Everything will be kept strictly confidential. We are offering \$10.00 because we think your time is valuable and our study is worthwhile.

You will receive a telephone call this week to arrange a time during the week of July 7-15 that is suitable for you. We hope to be able to provide transportation if needed.

We hope that you will agree to participate when we call you.

Sincerely,



W.N. Friedrich, M.A. Ph.D. Cand.
Instructor in Psychology

APPENDIX II
CONSENT FORM

CONSENT FORM

Description of the Study

This research project is a study of the attitudes and personality traits of mothers. You will be asked to fill out six different questionnaires and listen to a short tape recording of various sounds. During the tape recording, some scientific instruments will be attached to your hand to measure how your body is responding to the tape recording. If you agree to participate and complete the study, which will take from 50-70 minutes, you will receive \$10.00 for your efforts. All results will be used only for this study, and will be kept completely confidential.

Informed Consent

I understand the nature of this research study as described above and agree to participate. If I wish to discontinue participation in the experiment at any time, I may do so.

Date

Signature

APPENDIX III

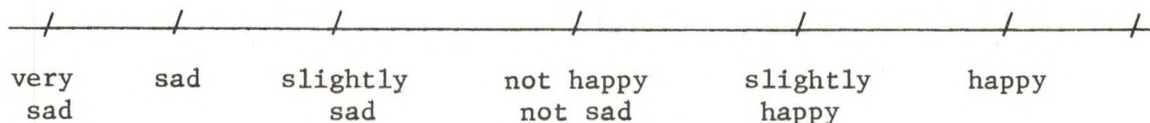
BACKGROUND INFORMATION SHEET

BACKGROUND INFORMATION SHEET

1. Name _____
2. Age _____
3. Marital Status (Check one):
☐ Single, never married ☐ Married ☐ Separated ☐ Divorced
☐ Remarried ☐ Widowed
4. Education (Circle the highest grade completed):
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 Higher
5. Approximate Monthly Income (Check one):
☐ \$400 or less ☐ \$401-\$500 ☐ \$501-\$600 ☐ \$601-\$700
☐ \$701-\$800 ☐ \$801-\$900 ☐ \$900 and higher
6. Total Number of Children (Circle one):
1 2 3 4 5 6 7 8 9 10 11 12 or higher
7. What are the ages of your children? Write in the ages from oldest to youngest on this line:

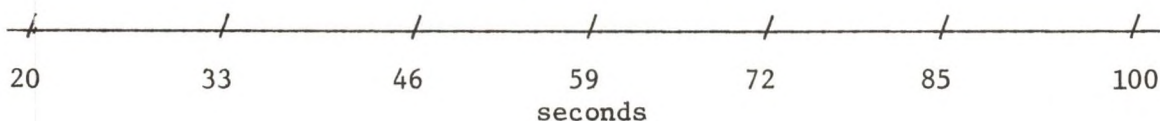
APPENDIX IV
AUDIOTAPE RATING SCALES

Listed below are some questions about the tape. You are to answer by placing a mark anywhere along the line that best describes what you feel is the best answer. For example, pretend that one question asked you how you were feeling now, and you felt a little more happy than you usually feel. So you would place a mark on the line like this:

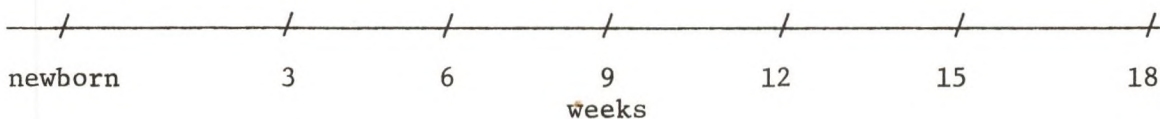


Now go ahead with the rest of the questions. Remember to put a mark anywhere on the line that describes your answer the best.

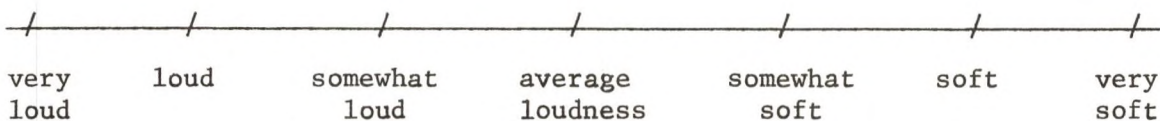
1. How long was the baby's cry (in seconds)?



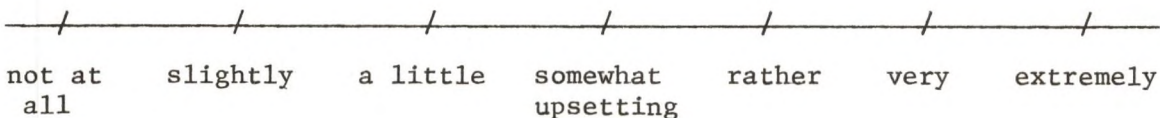
2. How old was the baby (in weeks)?



3. How loud was the baby?



4. How irritating and upsetting was the cry to you?



5. How angry was the baby?

extremely very rather somewhat
angry a little slightly not at all

6. How demanding was the cry?

extremely very rather somewhat
demanding a little slightly not at
all

APPENDIX V

STATEMENT OF PURPOSE OF STUDY

Thank you for your participation in this study. The various tests that you took measure different aspects of personality. I plan to determine whether personality is related to how your body reacted to the sounds that you heard on the tape recording. These sounds were a baby's cry, a tone produced by a machine called a tone generator and white noise, which sounds a lot like the static you hear on the television or radio. You are one of about 50 mothers who have taken part in this study, which is part of the work I have to do to receive my doctoral degree from UND. Do you have any questions?

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