

Effects of Maltreatment on Young Children's Socioemotional Development: An Attachment Theory Perspective

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The effects of maltreatment on early childhood development were examined in three domains suggested by attachment theory: relationships with novel adults, effectance motivation, and cognitive maturity. Three samples of children between 4 and 8 years of age were studied: 93 maltreated children, 67 demographically matched nonmaltreated children from families receiving welfare, and 30 nonmaltreated children from middle-class families. Children's scores on 10 dependent variables across the three domains of interest were factor analyzed, and two theoretically meaningful factors emerged. Maltreated children scored lower than welfare children, who in turn scored lower than middle-class children, on a factor measuring secure readiness to learn in the company of novel adults. Maltreated children and welfare children also scored higher than middle-class children, but did not significantly differ from each other, on a factor measuring outer-directedness. Results indicate that, during early childhood, maltreatment disrupts a dynamic balance between the motivation to establish safe, secure relationships with adults and the motivation to venture out to explore the world in a competency-promoting fashion.

Until several years ago, scientific studies of the effects of maltreatment on children's development were largely atheoretical. Consequently, even the findings from the few well designed studies were difficult to put into scientific or practical use because they could not be placed in a meaningful theoretical context (Aber & Cicchetti, 1984). Recently, however, rigorous studies of the effects of maltreatment on children's development have begun to emerge from several theoretical vantage points in developmental psychology, most notably from the attachment perspective of Ainsworth (1979; Ainsworth, Blehar, Waters, & Wall, 1978) and Sroufe (1979, 1983).

According to attachment theory and research, insensitive,

unresponsive, and rejecting parenting during the first year of life results in an insecure attachment relationship between an infant and his or her parents (Ainsworth et al., 1978; Belsky, Rovine, & Taylor, 1984; Egeland & Farber, 1984). In turn, an insecure attachment relationship has been found to predict later impairments in a number of stage-specific child tasks and competencies, such as interacting with friendly but unfamiliar adults, exploring the nonpersonal object world, and developing symbolic play and cognitive problem-solving abilities (Arend, Gove, & Sroufe, 1979; Belsky, Garduque, & Hrcir, 1984; Easterbrooks & Goldberg, 1984; Main & Weston, 1981; Matas, Arend, & Sroufe, 1978; Slade, 1987). Conceptually, these impairments can be attributed to the parent's inability to provide the infant with a secure base from which to explore the world.

Confirming the predictions from attachment theory, subsequent studies indicate that maltreated infants and toddlers, compared with appropriately matched samples of nonmaltreated infants and toddlers, exhibit a higher proportion of insecure attachments to their primary caregiver (Crittenden, in press; Egeland & Sroufe, 1981; Schneider-Rosen, Braunwald, Carlson, & Cicchetti, 1985) and, subsequently, more avoidance and approach-avoidance behaviors with nonparental caretakers (George & Main, 1979), more frustration, aggression, and negative affect in cognitive problem-solving situations, and lower developmental quotients (Egeland & Sroufe, 1981).

Despite a growing interest in attachment beyond infancy and toddlerhood (e.g., Erickson, Sroufe, & Egeland, 1985; Main, Kaplan, & Cassidy, 1985; Sroufe, 1983; Sroufe, Fox, & Pancake, 1983), little research has applied attachment theory to maltreated preschool and early school-age children (Egeland, Sroufe, & Erickson, 1983). However, extensive research has been conducted by Zigler and his colleagues on the similar phenomenon of the effects of social deprivation on young children's development (e.g., Zigler & Balla, 1982a). Much of this work

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provides both a measurement strategy and a data base that could be effectively integrated with attachment theory to form a framework for investigating the effects of maltreatment on socioemotional development in early childhood.

Our study is designed to extend attachment theory and research on maltreated children into the preschool and early school-age years and to integrate it with some of the experimental methods and findings from previous studies of the effects of social deprivation on early childhood development. In keeping with the assessment principles of attachment/organizational theory (Cicchetti, Carlson, Braunwald, & Aber, in press; Sroufe, 1979, 1983; Waters & Sroufe, 1983), our study identifies several developmental domains that are (a) especially important during early childhood, (b) potentially affected by a history of maltreatment, and (c) theoretically related to previous research on the early development of maltreated children. Three such domains are relationships with novel adults, effectance motivation, and cognitive maturity.

Theoretically, children's expectancies of adult availability and responsiveness are thought to develop in infancy and toddlerhood through interactions between the children and their primary attachment figures. These expectancies concerning the availability and responsiveness of adults are carried forward via internal representational models of self-in-relationships, which in turn may influence both the construction of new relationships and the ability to explore and cope with the demands of new and stressful situations later in development (Bowlby, 1980; Main & Weston, 1981; Sroufe & Fleeson, 1986).

Empirically, two separate lines of research on the socioemotional development of preschool children suggest that both insecurity of infant attachment and early social deprivation distort relationships with unfamiliar adults outside the home, leading to excessive dependence on novel adults and possibly to excessive wariness and imitation (Balla & Zigler, 1975; Sroufe, 1983; Sroufe et al., 1983; Yando, Seitz, & Zigler, 1978; Zigler & Balla, 1982a). Effectance motivation, conceptualized as the child's motive to deal competently with his or her environment for the intrinsic pleasure of mastery (White, 1959), also has been found to be related to both insecurity of infant attachment and to a child's history of social deprivation (Arend et al., 1979; Harter, 1978; Harter & Zigler, 1974).

On the basis of these theoretical and empirical considerations, we hypothesized that these two domains of early childhood development—relationships with novel adults and effectance motivation—both would be adversely affected by a history of maltreatment. The two domains are analogous to the infant's attachment to the primary caregiver and exploration of the environment. Thus, this study, like previous attachment-oriented studies, examines whether maltreatment affects the balance between children's security-promoting operations and effectance-promoting operations.

Cognitive maturity is a third developmental domain of special interest in studies of the effects of child maltreatment. Poor performance on measures of cognitive maturity (e.g., mental age as measured by standardized intelligence tests) has been associated with a history of maltreatment (Barahal, Waterman & Martin, 1981; Hoffman-Plotkin & Twentyman, 1984; Rohrbeck & Twentyman, 1986). Other research provides support for the notion that such deficits may result from interpersonal ex-

pectancies that impair performance. Distinct lines of research on motivational factors that increase the competence-performance gap in the symbolic play of insecurely attached children (Belsky et al., 1984), on motivational factors that lower the performance of disadvantaged children on IQ-like tests (Zigler, Abelson, & Seitz, 1973; Zigler, Abelson, Trickett, & Seitz, 1982), and on the link between maltreatment and extrinsically oriented social cognitive styles that lower test performance (Barahal et al., 1981) all are consistent with the presence of a significant interpersonal expectancy component as a mediating factor in the poor cognitive performance of maltreated children. On the basis of these considerations we hypothesized that maltreated children would score lower on tests of cognitive maturity than would appropriately matched nonmaltreated children.

Although a significant amount of research has been conducted within each of the individual domains described above, researchers have not yet taken the critical step of conceptually and empirically linking these findings together within a developmentally appropriate framework. The main purpose of this study was to examine the effects of maltreatment on preschool and early school-age children using a range of measures within three domains: relationships with novel adults, effectance motivation, and cognitive maturity. However, this study went beyond an individual-measures approach to consider the extent to which the effects of maltreatment could be more coherently understood as manifestations of a few underlying constructs central to early socioemotional development.

In order to enhance the generalizability of the findings of this study and thus narrow the gap between basic and applied research on the sequelae of child maltreatment, the study focuses on a sample of maltreated children that is representative of the preschool and early school-age children in the caseloads of public and private social service agencies. Most families of these maltreated children (93%) were receiving or recently had been receiving Aid to Families with Dependent Children (AFDC). This investigation employs a two comparison group strategy, comparing maltreated children both with children whose families are on AFDC and/or who share other important sociodemographic characteristics and with nonmaltreated children from middle-class families. Thus, the developmental status of the maltreated children can be compared with that of a "normative" sample of middle-class children and with a "high-risk" sample of lower-class children. This enables us to begin to distinguish those aspects of socioemotional developmental status unique to the maltreated children from those aspects shared with the high-risk sample by virtue of their lower-class status (Aber & Cicchetti, 1984; Elmer, 1977).

Method

Subjects

The children in this study consisted of a cohort of 190 preschool and early school-age children from a short-term longitudinal study of the development of maltreated children (Cicchetti, et al., in press; Cicchetti & Rizley, 1981). Three samples of children between the ages of 4.0 and 8.1 years were recruited for the study. The mean age for the children in each of the three samples was 5.7 or 5.8 years.

Children from maltreating families. The children in this sample

Table 1
Demographic Characteristics for Maltreated, AFDC, and Middle-Class Children and Their Families

| Demographic characteristics | Maltreated group | | AFDC group | | Middle-class group | |
|---|------------------|-----------|------------|-----------|--------------------|-----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| Child's age (years) | 5.7 | 1.2 | 5.7 | 1.3 | 5.8 | 1.2 |
| Child's race (% minority) | 11 | | 15 | | 17 | |
| Household prestige score (0-100 scale) | 47.4 | 5.3 | 49.2 | 5.9 | 60.6 | 7.7 |
| Annual family income (in thousands of dollars, 1981-1984) | 9.0 | 6.8 | 7.7 | 6.1 | 28.4 | 14.3 |
| Ratio of adults to children in the home | .69 | .53 | .74 | .43 | .81 | .46 |
| Mother's age (years) | 30.1 | 5.1 | 30.5 | 5.1 | 34.3 | 4.8 |
| Mother's highest grade | 11.1 | 2.0 | 11.7 | 2.1 | 14.6 | 2.3 |
| Spouse/Partner in home (% yes) | 40 | | 28 | | 73 | |

Note. AFDC indicates families receiving Aid to Families with Dependent Children. For maltreated sample, $n = 93$; for AFDC, $n = 67$; for middle-class, $n = 30$.

($n = 93$, 52 boys and 41 girls) were referred to the study by social workers from public and private protective service agencies in urban and suburban communities in a New England state. Each child in this group either (a) was reported to the state as a maltreated child ($n = 87$) or (b) had a sibling who was reported to the state as maltreated and the child himself or herself was named in the treatment plan as being in need of protective services ($n = 6$). In either case the initial report of maltreatment was investigated by the state and confirmed. As reported by their case workers, the children suffered from multiple and overlapping types of maltreatment, most commonly physical neglect (71%), emotional mistreatment (41%), and physical injury (40%).

Children from AFDC families. The children in this sample ($n = 67$, 34 boys and 33 girls) were recruited through advertisements placed in welfare offices, housing projects, neighborhood stores and laundromats near welfare offices, and in newspapers with heavy readership in poor communities. Each child in this group lived in a family that was currently receiving or recently had been receiving welfare stipends.

Children from middle-class families. The children in this sample ($n = 30$, 13 boys and 17 girls) were recruited by advertisements asking for volunteers to participate in studies of family life and child development. Each child in this group lived in a family with at least one working parent and that was not receiving welfare stipends. Before their participation in the study, the parent of each nonmaltreated (AFDC and middle-class) child was interviewed to ensure that the child had not been reported to the state for child abuse or neglect.

Table 1 presents data on family and child demographic characteristics for each of the three groups of children. The household prestige scores presented are based on Mueller & Parcel's (1981) suggested use of Nock & Rossi's (1979) measures of family socioeconomic status, which account for differences between one-parent and two-parent families and assign separate scores for unemployed persons who are "housewives" and for those who are "looking for work." Appropriate one-way analyses of variance (ANOVAs) were performed on group means for each continuous variable and chi-square analyses were performed for each categorical variable.¹ As anticipated, there were no significant differences between AFDC and maltreating families on any demographic measures. There were consistent differences between these two groups and the middle-class group on all demographic characteristics except for the controlled variables of age and sex and the ratio of adults to children in the home.

Measures

Each of the measures of children's socioemotional development was chosen for this study on the basis of its theoretical relevance to the study of maltreated children and by virtue of its previous successful use in studies of the development of socially deprived children. These previous studies also established the reliability and construct validity of each of the measures with various samples of socially deprived children. The measures and constructs employed in this study are described as follows.

Dependency and wariness. The Marble-in-the-Hole game (Alexander, Haganir, & Zigler, 1985; Balla & Zigler, 1975) measures a child's desire for and responsiveness to social reinforcement from a unfamiliar adult, that is, dependency. The child is instructed to place marbles of one color into one hole of a wooden box and marbles of a second color into another hole while the experimenter verbally reinforces the child. Because the task is so simple and repetitive, the primary motivation to continue to play the game is assumed to be the child's desire to receive positive reinforcement from the experimenter. The measure of dependency is the total length of time the child chooses to play the game over two consecutive trials (the maximum time is 10 min per trial). Zigler has presented considerable evidence showing that socially deprived children are more responsive to social reinforcement (more dependent) than are less deprived children (Balla & Zigler, 1975; Zigler, 1961, 1963; Zigler & Balla, 1972; Zigler, Balla, & Butterfield, 1968).

A measure of wariness is derived from the comparative length of time of the two trials of the game. Less fearful children become satiated by the game and the social reinforcements during Trial 1 and so play the game for a shorter period in Trial 2. Fearful children, on the other hand, appear to use Trial 1 to assure themselves that the game is safe and involves no punishment. Thus, fearful children play Trial 2 for a longer

¹ Because some of the children in this study were related to each other (there were a total of 32 such pairs or triads of siblings, and there were a total of 38 extra degrees of freedom that were contributed by inclusion of these siblings), these analyses may provide a somewhat liberal test of group differences. This was deemed acceptable for examining demographic characteristics of groups; the Results section discusses the way in which sibling pairs were handled for primary analyses in the study.

time than Trial 1. Zigler and colleagues (Alexander et al., 1985; Weaver, Balla, & Zigler, 1971) have demonstrated that retarded (as opposed to nonretarded) children and retarded persons residing in large central institutions (as opposed to smaller settings) demonstrate higher levels of wariness using this measure.

Interpersonal distance. The Felt Board Game (Weaver et al., 1971; Yando, Zigler, & Gates, 1971) measures how far a child places himself from a stationary, unfamiliar adult (interpersonal distance). The child is instructed to place a series of six brightly colored felt cutout pieces onto a long felt panel. The distance between the experimenter and the child's placement of the felt piece is summed over the six trials to form a measure of interpersonal distance. In previous studies of children's approach/avoidance toward adults, this measure of interpersonal distance has been found to be sensitive to experimental variation in social reinforcements (Weaver et al., 1971) and to intervention effects owing to participation in a Head Start program (Zigler et al., 1982).

Imitation. A child's tendency to imitate an adult was measured by the Sticker Game Imitation Task (Achenbach & Zigler, 1968; Zigler et al., 1973; Zigler et al., 1982). Children watch an experimenter make and name a picture using construction paper and a glue stick and are then asked to "make any picture they want" using the same materials. Children's imitation scores are obtained by rating the similarity of the child's picture to the experimenter's on a 0-3 scale for each of three different sets of pictures and then summing these ratings to yield a 0-9 rating of imitation. Children's total imitation score is the sum of their scores over three trials. Children from economically disadvantaged families have been found to imitate more than children from nondisadvantaged families (Zigler et al., 1973).

Various aspects of effectance motivation were assessed using three different measures from the Harter and Zigler (1974) effectance motivation battery.

Level of aspiration. A Puzzle Preference Task (Harter & Zigler, 1974) measures the child's level of aspiration. On each trial the child is shown four puzzles of graduated difficulty and instructed to pick one puzzle to complete. Two trials of four puzzles are presented to each child and the dependent measure of level of aspiration is the sum of the two difficulty levels chosen (1 = *easiest*, 4 = *hardest*).

Pictorial curiosity. A pictorial curiosity measure (Harter & Zigler, 1974) was administered to each child. The child is shown 12 cardboard houses, each with a pair of doors. On one door is a picture with an identical picture behind the door. The other door is blank and behind it lies a different picture. The child is permitted to open only one door. The number of blank doors a child chooses provides a measure of the child's curiosity.

Variability seeking. A Box Maze measure (Harter & Zigler, 1974) was used to assess a child's motivation to seek variation in a task. The task consists of a box maze-shaped drawing depicting numerous alternative paths from a dog to its bone. The maze contains no blind alleys and is always 10 segments long. The child is administered five consecutive trials on different colored paper and is told to "show the dog a way to get to the bone." The child draws the pathway any way he or she pleases except that he or she cannot go backwards. A logical rating system (described in Harter & Zigler, 1974) is used to determine the amount of variation in each of the four trials following the original completion of the maze. These are summed and yield a score between 0 and 200.

Harter and Zigler (1974) validated these measures of effectance motivation by demonstrating that they (a) differentiated among normal, noninstitutionalized retarded and institutionalized retarded children matched for mental age and (b) correlated with children's verbal reports of effectance motivational reasons for their behavior on the measures.

During the administration of two of the measures, described earlier, opportunities existed to collect data unobtrusively on two other theoretically relevant behaviors.

Verbal attention seeking and approval-seeking smiles. During the Sticker Game Imitation Task, there is an opportunity to assess the verbal attention-seeking behavior of the child. Following the child's completion of the Puzzle Preference Task, a child's approval-seeking smiles can be assessed. Both of these measures were videotaped without the child's knowledge from behind a one-way mirror.

Two independent raters who were blind to children's group membership as well as to the study's hypotheses used 4-point codes developed and validated by Kohlberg and Zigler (1967) to code verbal attention-seeking behavior (3 = *verbal request for something other than information*, 2 = *simple question*, 1 = *declarative statements not requiring a response*, 1/2 = *egocentric comment*, 0 = *no verbalization*) and developed by Harter (1972) and validated by Molnar and Weisz (1981) to code approval-seeking smiles (0 = *no smile*, 1 = *slight smile*, 2 = *full smile*, 3 = *laugh or giggle*) from the videotape records. Interrater reliabilities for these two measures in our study were very high, with Pearson product-moment correlations of .97 for the verbal attention-seeking code and .90 for the smile code.

Cognitive maturity. Children's cognitive maturity, as indexed by their receptive vocabulary, was measured using the revised Peabody Picture Vocabulary Test, Form L (PPVT). Adequate reliability and validity data are presented in the revised PPVT manual (Dunn & Dunn, 1980) as well as data that indicate a strong relation between children's age-standardized scores on the PPVT and other measures of cognitive maturity such as the full-scale IQ score for the WISC-R ($r = .70$).

For each measure employed in this study, a child's high score indicates that the child's behavior is more indicative of the construct being measured.

Procedures

Family participation in the study was solicited during initial recruitment interviews with parents at each child's home. Family and parent demographics data were collected during a subsequent interview. Child measures were collected in the first hour of each of two 2-hr laboratory visits. In each visit child and mother were greeted by a research assistant who described the measures and procedures and obtained informed consent. Then the research assistant escorted the child to an experimental room (which was furnished much like a big family playroom) and introduced the child to an experimenter whom the child had never met before.

The Marble-in-the-Hole Game and the Sticker Game were administered in fixed order in Visit 1. The Felt Board Game, Curiosity Task, Box Maze Task, Puzzle Preference Task and Peabody Picture Vocabulary Test were administered in fixed order in Visit 2. At the end of each visit all families were paid \$15 for their participation that day.

Different experimenters conducted Visits 1 and 2. Experimenter's sex was assigned randomly and remained constant across visits for each child. Experimenters were drawn from a pool of 16 male and female experimenters who received extensive training and ongoing supervision in the administration of the measures. All experimenters were blind to children's group status, (maltreated vs. AFDC vs. middle class) as well as other salient family characteristics like parent education, occupation, income, and marital status.

Results

Analyses of the results of this study occurred in two stages. First, the psychometric characteristics and interrelation of the 10 dependent measures (described earlier) were explored, with a factor analysis used to guide the construction of summary developmental outcome variables. These developmental outcome variables were then used to examine differences among

Table 2
Zero-Order Correlations Among Dependent Measures of Development

| Developmental variable | Relationships with novel adults | | | | | | Effectance motivation | | | IQ |
|----------------------------------|---------------------------------|------|------|------|------|------|-----------------------|-----|-----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Relationships with novel adults | | | | | | | | | | |
| 1. Dependency (NL) | — | | | | | | | | | |
| 2. Wariness | .03 | — | | | | | | | | |
| 3. Interpersonal distance | .04 | .02 | — | | | | | | | |
| 4. Verbal attention seeking (NL) | -.06 | .26 | -.13 | — | | | | | | |
| 5. Imitation (NL) | -.04 | .07 | .04 | .22 | — | | | | | |
| 6. Approval-seeking smiles | .13 | .05 | -.10 | .28 | .20 | — | | | | |
| Effectance motivation | | | | | | | | | | |
| 7. Pictorial curiosity | -.21 | -.11 | -.04 | -.16 | -.20 | -.10 | — | | | |
| 8. Variability seeking | -.11 | -.20 | .00 | -.13 | -.05 | .04 | .35 | — | | |
| 9. Level of aspiration | -.11 | .00 | -.08 | -.07 | .04 | -.07 | .11 | .18 | — | |
| Cognitive maturity | | | | | | | | | | |
| 10. IQ (derived) | -.16 | .13 | -.09 | .03 | -.06 | .03 | .28 | .13 | .14 | — |

Note. NL denotes that variable was previously submitted to a natural log transformation.

maltreated, AFDC, and middle-class children in socioemotional development.

Summary Developmental Outcome Variables

Scores on 3 of the measures (dependency, verbal attention seeking, and imitation) were skewed in their distributions. Thus, they were subjected to natural log transformations, and transformed scores were used in all subsequent analyses. Next, the interrelation of the 10 dependent measures was explored. Table 2 presents the intercorrelations of these variables for this sample. A principal factors analysis, varimax rotation, using squared multiple correlations for initial communality estimates was used to explore the factor structure underlying these 10 constructs.

The results are presented in Table 3. Two factors accounted

Table 3
Principal Factors Analysis of Developmental Variables

| Developmental variable | Factor loading | |
|---------------------------------|----------------|----------|
| | Factor 1 | Factor 2 |
| Relationships with novel adults | | |
| Dependency (NL) | -.34 | |
| Wariness | | .33 |
| Interpersonal distance | | |
| Verbal attention seeking (NL) | | .52 |
| Imitation (NL) | | .31 |
| Approval-Seeking smiles | | .41 |
| Effectance Motivation | | |
| Pictorial curiosity | .57 | |
| Variability seeking | .47 | |
| Level of aspiration | | |
| Cognitive maturity | | |
| IQ (derived) | .45 | |

Note. Factor 1 represents "secure readiness to learn and to explore in the company of unfamiliar adults." Factor 2 represents an externally oriented style of problem solving, referred to as "outer directedness." NL denotes that the variable was previously submitted to a natural log transformation.

for 100% of the variance in the reduced correlation matrix.² Children who score high on Factor 1 are high in pictorial curiosity, variability seeking, and cognitive maturity and low in dependency. This factor appears to tap children's "secure readiness to learn and to explore in the company of unfamiliar adults." Children who score high on Factor 2 are high on verbal attention seeking, approval-seeking smiles, wariness, and imitation. This factor appears to tap children's compliant, externally oriented style of problem solving, which is referred to as "outer directedness." Factor scores for each factor were constructed by summing the unit weightings of standard scores of each variable loading above .30 on a factor.³

Group Differences on Outcome Variables

Before examining the main effects of Group on the Secure Readiness and Outer Directedness factors, multivariate analyses of variance (MANOVAs) were performed to determine the main effects of child's age and sex, experimenter sex, and the interaction of each of these three variables with Group on the factors. A significant main effect of age was revealed using Wilk's criterion, $F(2, 187) = 27.66, p < .001$. Simple corre-

² The reduced correlation matrix (a matrix composed only of common variance among the dependent variables) accounted for 18% of the variance in the original variables. Although this figure appears somewhat low, it is not surprising in light of our decision to employ a broad array of individual measures of socioemotional development. Two other methods of factor analyses—the iterated principal components method and the maximum likelihood method (both varimax rotations)—each yielded virtually identical factor structures.

³ Use of unit weightings in constructing factor scores does not yield truly orthogonal factors. The actual correlation between the two constructed factors was $r = -.16, p < .05$.

We are indebted to Block & Block (1980) for the suggestion to build composites of individual measures as summary variables of underlying developmental/organizational constructs. They recommended and demonstrated the success of this strategy for increasing the ratio of construct variance to error variance in measures of early socioemotional and personality development.

Table 4
Means and Standard Deviations for and Analyses of Covariance on Summary Developmental Outcome Variables

| Summary developmental outcome variable | Maltreated group | | AFDC group | | Middle-class group | | F(2, 187) main effect for group |
|--|-----------------------------|-----------|----------------------------|-----------|-----------------------------|-----------|---------------------------------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | |
| Secure Readiness (Factor 1) | -.91 ^a (-.91) | 2.38 | .43 ^b (.44) | 2.35 | 1.98 ^c (1.92) | 2.00 | 22.04* |
| Outer Directedness (Factor 2) | .21 ^a (.16) | 2.42 | .00 ^a (-.03) | 2.49 | -.91 ^b (-.80) | 1.93 | 2.16 |

Note. Means adjusted for the covariates are presented in parentheses. Means with different superscripts are significantly different. AFDC indicates families receiving Aid to Families with Dependent Children. A post hoc comparison of means revealed that maltreated children scored lower than AFDC children, who in turn scored lower than middle-class children for Factor 1. For Factor 2 maltreated and AFDC children scored higher than middle-class children. *N*s for the groups were as follows: 93 for maltreated, 67 for AFDC, and 30 for middle class.

* $p < .001$.

lations revealed that child's age was significantly positively related to secure readiness ($r = .39, p < .001$) and significantly negatively related to Outer Directedness ($r = -.34, p < .001$). A significant effect for child sex was revealed, $F(2, 187) = 3.48, p < .05$, and followed with ANOVAs that revealed a significant effect of child sex on Outer Directedness, with boys appearing more outer directed than girls (M boys = .39, M girls = -.51), $F(1, 188) = 6.99, p < .01$. Given these findings, child's age and sex were covaried in further analyses involving both Outer Directedness and Secure Readiness. No significant main effects of experimenter sex or interactions of Group with child's age or sex or with experimenter sex were found for the two factors.

A multivariate analysis of covariance (MANCOVA) was next performed to test the effect of Group on the factors while covarying the effects of child's age and sex. The null hypothesis was rejected using Wilk's criterion $F(4, 368) = 11.57, p < .001$.⁴ This analysis was followed with one-way analyses of covariance (ANCOVAs) of the effects of Group on children's scores for each of the two factors with a posteriori tests of differences between pairs of means conducted using the Duncan method. As Table 4 indicates, a significant main effect for Group was found for Secure Readiness. Maltreated children scored lower than AFDC children, who in turn scored lower than middle-class children. Although no group differences were found in Outer Directedness in a three-group analysis, post hoc comparisons of means indicated that both maltreated and AFDC children scored higher than middle-class children.⁵

Discussion

These data indicate that the multiple measures of children's socioemotional functioning that we used in this study represent two theoretically meaningful underlying constructs of early childhood development: secure readiness to learn and outer directedness. Further, the data reveal that these two underlying constructs are differentially sensitive to a history of maltreatment over and above the effects of low socioeconomic status.

The Secure Readiness factor is composed of high effectance motivation (pictorial curiosity and variability seeking), high cognitive maturity, and low dependency. This factor can be interpreted tentatively as an organizational construct of competence in early childhood, because it seems to reflect the integra-

tion of cognitive, social, and emotional functioning required to meet the adaptational demands of a particular stage-salient task (Sroufe, 1979; Sroufe & Waters, 1977; Waters & Sroufe, 1983). Similar to the organizational construct of security of attachment in infancy, secure readiness to learn in early childhood also appears to represent a dynamic balance between establishing safe, secure relationships with adults and feeling free enough to venture out to explore the world in a manner that is likely to promote maturation of cognitive competencies.

As the results of the MANCOVA for the effects of Group indicated, children's secure readiness to learn showed a clear association with group status. Maltreated children demonstrated significantly less secure readiness to learn than did the AFDC children, who in turn demonstrated significantly less than the middle-class children. These findings of group differences in secure readiness are consistent with previous research of the effects of maltreatment on infant and toddler development (Egeland & Sroufe, 1981; Schneider-Rosen et al., 1985). At both developmental stages, maltreatment appears to distort the balance between children's security-promoting operations and effectance-promoting operations.

These findings and interpretations of the effects of maltreatment on secure readiness to learn may help place several disparate findings in the child maltreatment literature in a new context. Independent investigators from various theoretical perspectives have found that maltreated preschool children exhibit greater dependency on their preschool teachers (Egeland et al., 1983), score lower on tests of cognitive maturity, perhaps for

⁴ Because of the presence of sibling groups within the sample (which add 38 questionable degrees of freedom to analyses), the primary MANCOVA and follow-up analyses of the main effects of group in this study were rerun on a reduced sample in which all but one child from each sibling group were randomly excluded from analyses. No substantial changes in the magnitude of any finding and no changes in the statistical significance of any finding were found; thus findings with the full sample are reported and discussed.

⁵ Results of single variable analyses indicated that seven of the eight variables loading on the Secure Readiness and Outer Directedness factors showed patterns of group differences consistent with the analyses using these composite variables. These results are available from J. Lawrence Aber on request.

motivational reasons (Barahal et al., 1981), and are rated by both their teachers and their parents as less ready to learn in school (Hoffman-Plotkin & Twentyman, 1984). The results of our study, when interpreted in the context of attachment/organizational theory, suggest that these may not be isolated impairments but may constitute impairments in a larger, integrated process, namely the development of a secure readiness to learn.

The Outer Directedness factor is composed of verbal attention seeking, approval-seeking smiles, wariness, and imitation. Theoretically, outer directedness has been defined as an orientation to problem solving in which the young child relies on external cues rather than on his or her own cognitive resources. Zigler believes that this dimension also taps the extent of children's conformity to or compliance with adults, especially for children from environments where a high degree of compliance has adaptive value (Zigler & Balla, 1982a).

Consistent with earlier findings (Zigler & Balla, 1982a), the two more cognitively immature and socially deprived groups—maltreated children and AFDC children—scored higher on outer directedness than did the middle-class children. However, the maltreated and AFDC groups did not significantly differ from each other in their degree of outer directedness. Thus, unlike its effect on secure readiness to learn, maltreatment does not appear to have an effect on young children's outer directedness over and above the effects attributable to their lower socioeconomic status.

Several possible explanations for this finding on outer directedness should be considered. First, although previous clinical and empirical studies suggest that maltreated preschool children are more compulsively compliant with their parents than are nonmaltreated children, perhaps such compliance has not yet been generalized beyond this particular "relationship-at-risk" to relationships involving other adults (Aber & Cicchetti, 1984; Crittenden, in press). Alternatively, and consistent with Elmer's (1977) position, perhaps outer directedness in early childhood cannot be incrementally affected by maltreatment because the poverty and sources of failure associated with low socioeconomic status have already done all the possible damage.

A comparison of the findings regarding the effects of maltreatment on outer directedness and on secure readiness to learn suggests a third position. Whether maltreatment has an effect on children over and above the effects due to low socioeconomic status appears to depend on the domain of development under investigation. From both the attachment/organizational (Cicchetti et al., in press) and ecological (Belsky, 1980, 1984) perspectives, this position makes sense: Neither theory predicts blanket impairments in development due to maltreatment but, rather, impairments in specific domains at particular stages of development.

For instance, recent research that found important differences and similarities in the child-rearing environments of abused and demographically matched nonabused children can provide the basis for more specific hypotheses about why maltreatment affects some but not all potentially relevant domains of development (Trickett & Susman, 1986). It found that abusive parents were higher in an overly competitive form of achievement orientation, lower in openness to new experiences, and lower in encouragement of independence for their children;

they were not different, however, in nonpunitive punishment or authoritarian control. Conceptually, such factors as a parent's openness to new experiences and encouragement of independence may influence young children's secure readiness to learn. Likewise, parental punishment and authoritarian control may be related to children's outer directedness. Future studies are needed to determine whether such patterns of similarities and differences in the developmental ecologies of poor maltreated and nonmaltreated children can account for the observed patterns of differential effects of maltreatment on various aspects of socioemotional development.

In light of the correlations of secure readiness with age, one general interpretation of the effects of maltreatment is that it slows children's rate of socioemotional development. An alternative position is that maltreatment does not lead to developmental lags but rather to qualitative differences in development. Recent research suggests that these two positions may not be mutually exclusive but, rather, may work in complex, sequential fashion (Dodge, Murphy, & Buchsbaum, 1984; Zigler & Balla, 1982b). For some populations of children at risk, initial developmental lags may become structuralized over time into nondevelopmental, qualitative differences in developmental pathways. Because of the cross-sectional nature of this study, we cannot decide on a developmental or difference interpretation of the effects of maltreatment on children's secure readiness to learn. Similarly, we cannot determine if the observed "developmental lags" of maltreated children are causes or consequences of maltreatment or parts of more complex transactional phenomena characteristic of mutual feedback systems (Cicchetti & Rizley, 1981). Future longitudinal studies are required to address these issues.

According to attachment/organizational theory, a child's competency at one stage-salient developmental task should predict a child's competency at future tasks. In addition, a child's performance on lab measures of important developmental constructs should predict a child's adaptive functioning in important developmental ecologies outside the lab—notably in the home, at school, and in the peer group. These axioms coupled with the results of this study suggest several other future studies that could both enhance our understanding of the development of maltreated children and simultaneously contribute to an elaboration of an attachment/organizational theory of the early childhood years. For instance, nondependent relations with novel adults, effectance motivation, and cognitive maturity all can be conceptualized as component features of young children's larger developmental task of successful adaptation to their school environment. Several questions can be raised. Does a history of maltreatment affect children's adaptation to their first major out-of-home environment, the school? Does "secure readiness to learn in the company of unfamiliar adults" mediate the relation between a history of maltreatment and adaptation to school? Other crucial stage-salient developmental tasks of early childhood posited by attachment/organizational theory include the attainment of new levels of impulse control and the construction of positive peer relationships (Sroufe, 1979, 1983). Are maltreated children more impulsive and less competent with peers during the preschool and early school-age years? Are incompetencies on these tasks predicted by developmental lags

in secure readiness to learn or outer directedness? Follow-up studies addressing these questions are currently underway.

Despite some shortcomings, this study constitutes a successful first step in conceptualizing and testing an attachment/organizational theory of the effects of maltreatment on early childhood development. When a theoretical framework and set of well validated empirical relations are more firmly in place, it will be possible to take the next important step, namely, the analysis of causal processes that mediate the relation between maltreatment, insecurity, and later maladaptation. Analyses of causal processes not only will improve our scientific understanding of the effects of maltreatment on development but may also provide much needed guidance for clinical and preventive intervention strategies.

References

- Aber, J. L., & Cicchetti, D. (1984). The socio-emotional development of maltreated children: An empirical and theoretical analysis. In H. Fitzgerald, B. Lester, & M. Yogman (Eds.), *Theory and research in behavioral pediatrics*, (Vol. 2, pp. 147-205). New York: Plenum Press.
- Achenbach, T. M., & Zigler, E. (1968). Cue-learning and problem-learning strategies in normal and retarded children. *Child Development*, 39, 827-848.
- Ainsworth, M. D. S. (1979). Infant-mother attachment. *American Psychologist*, 34, 932-937.
- Ainsworth, M. D. S., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.
- Alexander, K., Haganir, L., & Zigler, E. (1985). Effects of different living settings on the performance of mentally retarded individuals. *American Journal of Mental Deficiency*, 90, 9-17.
- Arend, R., Gove, F. L., & Sroufe, L. A. (1979). Continuity of individual adaptation from infancy to kindergarten: A predictive study of ego-resiliency and curiosity in preschoolers. *Child Development*, 50, 950-959.
- Balla, D., & Zigler, E. (1975). Preinstitutional social deprivation and responsiveness to social reinforcement in institutionalized retarded individuals: A six-year follow-up study. *American Journal of Mental Deficiency*, 80, 228-230.
- Barahal, R. M., Waterman, J., & Martin, H. P. (1981). The social cognitive development of abused children. *Journal of Consulting and Clinical Psychology*, 49, 508-516.
- Belsky, J. (1980). Child maltreatment: An ecological integration. *American Psychologist*, 35, 320-335.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, 55, 83-96.
- Belsky, J., Garduque, L., & Hrcir, E. (1984). Assessing performance, competence and executive capacity in infant play: Relations to home environment and security of attachment. *Developmental Psychology*, 20, 406-417.
- Belsky, J., Rovine, M., & Taylor, D. (1984). The Pennsylvania Infant and Family Development Project, III: The origins of individual differences in infant-mother attachment: Maternal and infant contributions. *Child Development*, 55, 718-728.
- Block, J. H., & Block, J. (1980). The role of ego control and ego resiliency in the organization of development. In W. A. Collins (Ed.), *Minnesota symposia on child psychology* (Vol. 13, pp. 39-101). Hillsdale, NJ: Erlbaum.
- Bowlby, J. (1980). *Attachment and Loss: Vol. 3. Loss*. New York: Basic.
- Cicchetti, D., Carlson, V., Braunwald, K., & Aber, L. (in press). The Harvard Child Maltreatment Project: A context for research on the sequelae of child maltreatment. In R. Gelles & J. Lancaster (Eds.), *Child abuse: A biobehavioral perspective*.
- Cicchetti, D., & Rizley, R. (1981). Developmental perspectives on the etiology, intergenerational transmission and sequelae of child maltreatment. In R. Rizley & D. Cicchetti (Eds.), *Developmental perspectives on child maltreatment* (pp. 31-55). San Francisco: Jossey-Bass.
- Crittenden, P. (in press). Relationships at risk. In J. Belsky & T. Nezworski (Eds.), *Clinical Implications of Attachment*. Hillsdale, NJ: Erlbaum.
- Dodge, K., Murphy, R., & Buchsbaum, K. (1984). The assessment of intention-cue detection skills in children: Implications for developmental psychopathology. *Child Development*, 55, 163-173.
- Dunn, L. M., & Dunn, S. (1980). *Revised manual for the Peabody Picture Vocabulary Test*. Circle Pines, MN: American Guidance Service.
- Easterbrooks, M. A., & Goldberg, W. (1984). Toddler development in the family: Impact of father involvement and parenting characteristics. *Child Development*, 55, 740-752.
- Egeland, B., & Farber, E. (1984). Infant-mother attachment: Factors related to its development and changes over time. *Child Development*, 55, 753-771.
- Egeland, B., & Sroufe, L. A. (1981). Developmental sequelae of maltreatment in infancy. In R. Rizley & D. Cicchetti (Eds.), *Developmental perspectives on child maltreatment* (pp. 77-92). San Francisco: Jossey-Bass.
- Egeland, B., Sroufe, L. A., & Erickson, M. (1983). The developmental consequence of different patterns of maltreatment. *Journal of Child Abuse & Neglect*, 7, 459-469.
- Elmer, E. (1977). A follow-up study of traumatized children. *Pediatrics*, 59, 273-279.
- Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between quality of attachment and behavior problems in preschool in a high-risk sample. In I. Bretherton & E. Waters (Eds.), *Growing points in attachment theory and research: Monographs of the Society for Research in Child Development* (pp. 147-166). Chicago: University of Chicago Press.
- George, C., & Main, M. (1979). Social interactions of young abused children: Approach, avoidance, and aggression. *Child Development*, 50, 306-318.
- Harter, S. (1972). *Smiling and mastery in retarded children*. Unpublished manuscript, Yale University.
- Harter, S. (1978). Efficance motivation reconsidered: Toward a developmental model. *Human Development*, 21, 34-64.
- Harter, S., & Zigler, E. (1974). The assessment of efficacy motivation in normal and retarded children. *Developmental Psychology*, 10, 169-180.
- Hoffman-Plotkin, D., & Twentyman, C. (1984). A multimodal assessment of behavioral and cognitive deficits in abused and neglected preschoolers. *Child Development*, 52, 13-30.
- Kohlberg, L., & Zigler, E. (1967). The impact of cognitive maturity on the development of sex-role attitudes in the years 4 to 8. *Genetic Psychology Monographs*, 75, 89-165.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood and adulthood: A move to the level of representation. In I. Bretherton & W. Waters (Eds.), *Growing points in attachment theory and research: Monographs of the Society for Research in Child Development* (pp. 66-104). Chicago: University of Chicago Press.
- Main, M., & Weston, D. (1981). The quality of toddler's relationship to mother and to father: Related to conflict behavior and the readiness to establish new relationships. *Child Development*, 52, 932-940.
- Matas, L., Arend, R., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. *Child Development*, 49, 547-556.
- Molnar, J. M., & Weisz, J. R. (1981). The pursuit of mastery by preschool boys and girls: An observational study. *Child Development*, 52, 724-727.

- Mueller, C., & Parcel, T. (1981). Measures of socioeconomic status: Alternatives and recommendations. *Child Development, 52*, 13-30.
- Nock, S. L., & Rossi, P. H. (1979). Household types and social standing. *Social Forces, 57*, 1325-1345.
- Rohrbeck, C., & Twentyman, C. (1986). Multimodal assessment of impulsiveness in abusing, neglecting, and nonmaltreating mothers and their preschool children. *Journal of Consulting and Clinical Psychology, 54*, 231-236.
- Schneider-Rosen, K., Braunwald, K., Carlson, V., & Cicchetti, D. (1985). Current perspectives in attachment theory: Illustration from the study of maltreated infants. In I. Bretherton & E. Waters (Eds.), *Growing points in attachment theory and research: Monographs of the Society for Research in Child Development* (pp. 194-210). Chicago: University of Chicago Press.
- Slade, A. (1987). The quality of attachment and early symbolic play. *Developmental Psychology, 23*, 78-85.
- Sroufe, L. A. (1979). The coherence of individual development: Early care, attachment and subsequent developmental issues. *American Psychologist, 34*, 834-841.
- Sroufe, L. A. (1983). Infant-caregiver attachment and patterns of adaptation in the preschool: The roots of maladaptation and competence. In M. Perlmutter (Ed.), *Minnesota Symposium in Child Psychology, 16*, 41-83.
- Sroufe, L. A., & Fleeson, J. (1986). Attachment and the construction of relationships. In W. Hartup & Z. Rubin (Eds.), *Relationships and development* (pp. 51-71). New York: Cambridge University Press.
- Sroufe, L. A., Fox, N., & Pancake, V. (1983). Attachment and dependency in developmental perspective. *Child Development, 54*, 1615-1627.
- Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development, 48*, 1184-1199.
- Trickett, P., & Susman, E. (1986). *The childrearing beliefs of physically abusive and nonabusive parents*. Unpublished manuscript, Laboratory for Developmental Psychology, National Institute of Mental Health, Bethesda, MD.
- Waters, E., & Sroufe, L. A. (1983). Social competence as a developmental construct. *Developmental Review, 3*, 79-97.
- Weaver, J., Balla, D., & Zigler, E. (1971). Social approach and avoidance tendencies of institutionalized retarded and noninstitutionalized retarded and normal children. *Journal of Experimental Research in Personality, 5*, 98-110.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297-323.
- Yando, R., Seitz, V., & Zigler, E. (1978). *Imitation: A developmental perspective*. Hillsdale, NJ: Erlbaum.
- Yando, R., Zigler, E., & Gates, M. (1971). The influence of negro and white teachers rated as effective and noneffective on the performance of negro and white lower-class children. *Developmental Psychology, 5*, 300-311.
- Zigler, E. (1961). Social deprivation and rigidity in the performance of feeble-minded children. *Journal of Abnormal and Social Psychology, 62*, 413-421.
- Zigler, E. (1963). Social reinforcement, environmental conditions and the child. *American Journal of Orthopsychiatry, 33*, 614-623.
- Zigler, E., Abelson, W. D., & Seitz, V. (1973). Motivational factors in the performance of economically disadvantaged children on the Peabody Picture Vocabulary Test. *Child Development, 44*, 293-303.
- Zigler, E., Abelson, W., Trickett, P., & Seitz, V. (1982). Is an intervention program necessary in order to improve economically disadvantaged children's IQ scores? *Child Development, 53*, 340-348.
- Zigler, E., & Balla, D. (1972). The developmental course of responsiveness to social reinforcement in normal children and institutionalized retarded children. *Developmental Psychology, 6*, 66-73.
- Zigler, E., & Balla, D. (1982a). Atypical development: Personality determinants in the behavior of the retarded. In E. Zigler, M. Lamb, & I. Child (Eds.), *Socialization and personality development*, (pp. 238-245). New York: Oxford University Press.
- Zigler, E., & Balla, D. (1982b). *Developmental and difference theories of mental retardation*. Hillsdale, NJ: Erlbaum.
- Zigler, E., Balla, D., & Butterfield, E. (1968). A longitudinal investigation of the relationship between preinstitutional social deprivation and social motivation in institutionalized retardates. *Journal of Personality and Social Psychology, 10*, 437-445.

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