The Development of Aggression in Toddlers: A Study of Low-Income Families

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The effort by developmental psychopathologists to understand the etiology of antisocial behavior has resulted in several significant findings. First, aggressive behavior is highly stable from early childhood into adolescence and adulthood. Second, parental factors including rearing practices and parental psychopathology, are correlated with childhood behavior problems. It was the aim of the present study to examine the correlates and stability of aggressive behavior in a sample of toddlers from low income families. Eight-nine mother–child dyads (52 boys and 37 girls) were observed in laboratory assessments when the child was 18- and 24-months old. Frequency and pervasiveness of aggression were coded from videotapes. Familial criminality, maternal depressive symptomatology, child noncompliance, and difficult child temperament were examined as contributors to the prediction of aggression in toddlers. Stability of aggression was moderate, especially for aggression occurring in low-stress situations. While there were few sex differences in the frequency and stability of aggression, there were marked differences in the correlates and predictors of aggression. Gender-specific, interactional models of the development of aggression are proposed.

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INTRODUCTION

The search for the etiology of antisocial behavior has resulted in a spate of developmental psychopathology literature focusing on both the identification of predictors (Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986; McCord, 1979; Parke & Slaby, 1990; Patterson, Capaldi, & Bank, 1992), and the establishment of the age at which aggressive behavior becomes stable (Cummings, Ianotti, & Zahn-Waxler, 1989; Huesmann, Eron, Lefkowitz, & Walder, 1984; Lytton, Watts, & Dunn, 1985; Moskowitz, Schwartzman & Ledingham, 1985; Olweus, 1979). This research has revealed two etiological clues: (1) that disruptive and aggressive behavior is already a stable behavioral pattern in school-age children, especially for boys (Cummings, et al., 1989; Olweus, 1979), and (2) that parental factors, including rearing practices and parental psychopathology, are correlated with childhood behavior problems (Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986; McCord, 1979; Parke & Slaby, 1990; Patterson et al., 1992). These findings imply that our understanding of the etiology of antisocial behavior could be enhanced by examining the period preceding school-age, and by focusing attention on factors influencing early child-rearing practices.

The investigation of stability is useful insofar as it leads back to critical junctures in the child's development, junctures which, when examined, may reveal factors involved in the initiation and reinforcement of precursors to antisocial behavior (i.e., aggressive behavior). In order to enlarge the current window of assessment to include the preschool period, an expanded operational definition of antisocial or disruptive behavior needs to be established to include its developmental precursors. Both parental reports and behavioral observations can serve to map out specific stages of a developmental pathway to aggression and later antisocial behavior via early parent–child interaction.

Several reviews on the stability of delinquency and aggression in school-age children have been particularly useful in furthering our understanding of the development of antisocial behavior. In Loeber's 1982 review, he presented evidence for the contribution of four factors to the stability of delinquent child behavior: density, occurrence in more than one setting, variety of behavior, and age of onset. The predictive utility of these four factors to the stability of aggression in children under age 5 remains to be tested.

Second, Olweus (1979) presented stability coefficients generated from a meta-analysis of 16 studies on the aggressive behavior of boys. He concluded that stability of aggression was comparable to that of intelligence, and that the determination of stability rested within individual reaction ten-

dencies and motivation. Since the publication of Olweus' meta-analysis, a few researchers have begun to explore whether the reported high stability of aggression in school-age children can be replicated in the preschool period. One such study was conducted by Cummings et al. (1989) on a sample of 43 children (22 boys and 21 girls). Although the frequency of aggression declined between the ages of 2 to 5, moderate to high correlations were found during this 3-year period (r = .47 to .76). Observers' global ratings at age 2 were also predictive of later aggressive behavior.

The literature on stability of aggression has left us with another question: At what age does aggression emerge and then become stable? The research which has been focused on stability from age 2 to 5 suggests that within the first 2 years of life behavioral aggression emerges and has the capacity to become a stable feature from preschool into adolescence. However, few investigators have provided evidence for the relationship between the emergence of the behavior and the continued use of it. Similarly, few investigators have operationally defined aggression for children 18 to 24 months old to allow for the assessment of frequency, pervasiveness, and variety.

Further, although gender differences in rates of externalizing behavior problems in school-age children and adolescents are well documented, such a difference remains to be examined in a sample of toddlers from low-income families. Evidence from two investigations from predominantly middle-class samples suggest that gender differences in aggression do not exist until age 4 or 5. Zahn-Waxler and colleagues reported no differences between toddler boys and girls on observed object-related aggression (Zahn-Waxler, Ianotti, Cummings, & Denham, 1990). In an epidemiological survey, Achenbach and colleagues found no significant gender differences on the Toddler Behavior Checklist (TBC; Achenbach, Edelbrock, & Howell, 1987); however, from age 4 up to 16, significant gender differences were found on the Child Behavior Checklist resulting in the formation of gender specific subsales (Achenbach & Edelbrock, 1983).

To date the majority of research on the developmental precursors of antisocial behavior has been focused on correlates of disruptive behavior in school-age children or adolescents (i.e., ages 6 to 17) (Loeber & Stouthamer-Loeber, 1986). Both child and parenting behaviors have been identified as predictive of later delinquency (Loeber & Dishion, 1983). An examination of the utility of these factors in predicting the early emergence of aggression in toddlers is needed. The lack of data on toddlers may be due to the older modal age of children referred for behavior problems, when disruptive behavior tends to increase in variety and severity. However, the onset of disruptive behavior at an earlier age may represent a distinct developmental pathway to later antisocial behavior, and thus may have a unique prognosis and treatment (Patterson et al., 1992). Additionally, in-

tervention may be more successfully implemented in the preschool period, when parent–child interaction is more malleable.

Based on the research findings on disruptive behavior in school-age children and adolescents, four factors from both child and parental domains have been identified as potential correlates of toddler aggression. These factors include child noncompliance, difficult child temperament, maternal depression, and familial criminality.

First, noncompliance can be viewed as a primary precursor to antisocial behavior. For example, noncompliance is believed to be a forerunner of later aggressive and delinquent behavior in school-age children (Biederman, Munir, & Knee, 1987; Loeber, Lahey, & Thomas, 1991). In toddlers the relationship between noncompliance and aggression is not clear, although both behaviors tend to emerge concurrently (Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987). It is possible that chronic noncompliance sets the stage for later aggressive behavior by escalating the level of frustration for both the parent and child. The predictive utility of oppositional–defiant behavior in school-age children to later aggression remains to be tested empirically with toddlers.

Second, difficult child temperament may serve to elicit negative parenting and lead to angry and aggressive parent–child interactions. Recent data have supported an interactional and/or transactional model between child temperament and caretaker characteristics that may dictate both the stability of early child characteristics, and the influence of temperament on child psychopathology (for a review, see Campbell, 1990). For example, Earls has reported from his longitudinal epidemiological study of childhood psychopathology that child temperament interacted with parental variables in predicting child behavior problems (Earls & Jung, 1987). Similarly, Lee and Bates (1985), using Patterson's coercive family interaction theory, studied the relationship between difficult temperament measured at 6, 13, and 24 months and mother–child interaction at 2 years of age. Results supported their hypothesis that mothers of temperamentally "difficult" children were more likely to use intrusive and negative control strategies, which were often met with resistance by the children. Both studies found that difficult child temperament was a more powerful predictor of behavior problems when parental factors were also assessed.

Third, maternal depression is recognized as a risk factor for the later development of childhood and adolescent externalizing problems (Ghodsian, Zajicek, & Wolkind, 1985; Richman & Harper, 1979; Zahn-Waxler et al., 1990). Several theoretical models of the development of child psychopathology, including attachment theory (Isabella & Belsky, 1991) and social learning theory (Patterson, 1982), provide a role for maternal depression as an important correlate of childhood disruptive behavior, par-

ticularly in how maternal depressive symptomatology may interfere with caregiving during the toddler period. Recent research on the toddler period suggests that, although a simple linear relationship may exist between maternal variables such as maternal depression and childhood behavior problems, the assessment of other ecological influences (e.g., financial constraints, overcrowding) may provide data for more precise models of the development of aggression and other behavior problems (Ghodsian, Zajieck, & Wolkind, 1984; Zahn-Waxler et al., 1990).

Finally, there have been many well-conducted studies on the influence of parental criminality on child behavior (Bohman, Cloninger, Sigvardsson, & von Knorring, 1982; Cloninger, Sigvardsson, Bohman, & von Knorring, 1982; Mednick, Gabrielli, & Hutchings, 1987; Robins, West, & Herjanic, 1975; West & Farrington, 1973). The results indicate that a child whose parent has a history of antisocial behavior is at greater risk for developing behavior problems him/herself. However, the attempt to isolate the influence of inherited genetic predispositions over socialization has proved unsuccessful. Few studies have examined how parental criminality may interact with other risk factors, such as low socioeconomic status, to increase a child's risk for developing antisocial behavior. The results from Loeber and Stouthamer-Loeber's meta-analysis (1986) indicated that lack of supervision, lack of parent–child involvement, and child neglect were better predictors of delinquent behavior than the parent's own criminality. These results suggest that the mechanism of action which places children of antisocial parents at risk may be the parent's poor child-rearing skills, and not an inherited genetic vulnerability.

A prudent approach to understanding the development of behavior problems in children involves the inclusion of multiple factors that work interactively to affect the parent–child relationship. Whether the development of antisocial behavior is driven primarily by the child or primarily by the caretaker remains a heated debate (Dodge, 1990; Lytton, 1990a, 1990b; Wahler, 1990). However the data overwhelmingly support an interaction between constitutional factors on the part of the child (e.g., difficult temperament), parental factors (e.g., parental psychopathology), and the social environment (e.g., low socioeconomic status). Yet much of the research on correlates of aggression and externalizing behavior problems has failed to conceptualize risk using such an interactionist perspective, and in so doing has left open the explanation of findings to a host of unaccounted variables.

The aim of this study is to provide data on a sample of at-risk children during a period of time when their behavior is evolving and malleable. The study is driven from an interactionist perspective, and thus assesses risk factors in the child's and parent's behavior, as well as in the child-rearing environment. Four questions will be addressed: (1) Is aggression in toddlers

from low-income families a stable behavioral pattern? (2) Do sex differences exist in the frequency, stability, and correlates of aggression in toddlers from low-income families? (3) Are traditional correlates of child externalizing problems such as parental psychopathology and negative child behavior valid for a sample of low-income toddlers? (4) Using the aforementioned correlates of aggression at 18 months, what are the best predictors of aggression at 24 months?

METHOD

Subjects

Subjects were 89 mother–child dyads (52 males and 37 females) recruited from the Women and Infant Care Program (WIC) of Allegheny County as part of a larger longitudinal study of child development. WIC is a federally funded program which provides nutritional services to low-income families with young children. Mothers of infants 6 to 11 months of age were recruited in the clinic waiting room by one of the principal investigators of the project. Children with profound handicaps or known sensorimotor deficits were excluded from the study. Mothers were informed that the investigators aimed to study child development and mother–child interaction patterns, and that they would be paid $15.00 for each lab visit and an additional $10.00 for transportation costs. Upon the mothers agreeing to participate, their informed consent was obtained and the first lab visit was scheduled to coincide within 2 weeks of the child's first birthday. Mothers were contacted 2 weeks before the assessment by mail and 1 week before by phone to confirm the appointment. Of the 129 women who agreed to take part in the study, 102 (79.0%) participated in the first laboratory assessment at 12 months. Of these, 89 (87.0%) participated in both the 18- and 24-month assessments. No significant differences were found between the 89 mothers who participated in both lab assessments and those lost to attrition, on demographic characteristics or on depressive symptomatology. Mothers who participated in both lab assessments rated themselves higher on a scale of aggressive tendencies than mothers who did not complete both assessments. The demographic characteristics of the sample are presented in Table I.

Procedures

Videotaped lab assessments were conducted at ages 12, 18, and 24 months, and a home visit was conducted at 15 months. For the purposes

Table I. Demographic Characteristics (N = 89)

Race of child		Sex of child	
White	52	Male	52
Black	31	Female	37
Mixed	6		
Family income (per year):		Marital status:	
<$6,000	33	Single	37
<$12,000	27	Married	28
<$18,000	16	Living together	15
<$24,000	8	Separated/divorced	9
<$30,000	2		
>$30,000	3		
Maternal age:			
16–19	11		
20–23	26		
24–27	24		
28–31	16		
over 30	12		
Maternal education		Maternal occupation	
Junior high school	1	Unemployed	65
Partial high school	16	Menial service	1
High school/G.E.D.	47	Un/semiskilled	5
Partial college or vocational training	23	Skilled/clerical	12
College degree	2	Semiprofessional	5
		Professional	1

of the present study, data are presented from the 18- and 24-month laboratory assessments. Separate laboratories were used at each assessment, both equipped with a one-way mirror through which the assessment was videotaped. Upon entering the lab, the mother was informed that she should set her child down in front of the toys set up on the floor, and have a seat with the examiner to complete questionnaires. The toys provided could be used for both constructive and aggressive play, including a baby doll, a popup box, a cobbler's bench including a hammer and pegs, plastic balls, and a tea pot. Unless otherwise specified, mothers were instructed to attend to their children as they normally would throughout the assessment.

Both 18- and 24-month lab assessments lasted approximately 120 min, and consisted of six different components. The first component was a free-play situation lasting 15 min, followed by a cleanup task, a situation with no toys in the room (Martin, 1981), and three mother–child problem-solving tasks (based on the work of Matas, Arend, & Sroufe, 1978). After a

10-min break, the lab visit continued with an assessment of mother–child attachment, as measured by the Strange Situation Test (Ainsworth & Wittig, 1969). The final component of the lab assessment began when the examiner returned to the room and continued to work on the questionnaires with the mother for 5 min.

The order of tasks varied slightly across the two lab visits, so that the no toys situation occurred after the cleanup task at the 18-month assessment, and after the problem-solving tasks at the 24-month assessment. The variation in protocol, however, did not affect the length or the order of the behavioral coding of the assessments.

Self-Report Measures

A series of self-report inventories were administered to mothers at each lab visit to assess possible correlates of childhood behavior problems. These included difficult child temperament, maternal depressive symptomatology, and familial history of police contact.

The Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979). The ICQ contains 32 7-point items which assess temperamental characteristics, including regularity of biological functioning, irritability, and unstoppability. The instrument has been shown to have good criterion validity (Bates et al. 1979), and has the additional advantage of being short and simple to understand. For the purposes of this study an abbreviated 14-item version was used which included items that loaded on the *difficultness* and *unstoppability* factors.

The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is a widely used continuous measurement of depressive symptomatology. Split-half reliability has been reported to range from .86 to .93 (Beck & Beamesderfer, 1974; Reynolds & Gould, 1981). The BDI was developed to assess current affect, and consequently uses an ascertainment window of 2 weeks. For the purpose of this study, the inventory was revised to cover the mother's general affect over the past 6 months in order to assess the existence of a depressive trait.

Demographic Questionnaire. This inventory includes questions regarding the occupational status of mother and partner, family income, the size of the house (number of rooms), the number of people living in the house, and a history of child care. For the purpose of the present study, a history of police contact, as reported by the mother for anyone living in the home, was used as an index of familial criminality.

Behavioral Codes

In the present study, child aggression and child noncompliance were coded from videotapes and used as predictor variables for later child aggression.

Aggression. Occurrences of aggressive behavior were coded during selected components of the 18- and 24-month assessments. There were three rationales for the selection of the coding intervals. The first was the probability of the elicitation of aggression, which was thought to be more likely when the child was experiencing stress. Thus, aggression was assessed during segments which offered varying levels of stress, from none (a free-play situation), to mild (cleaning up toys), to high (taking toys away or being left with another caretaker). The second rationale was ecological validity; that is, taking toys away from children and leaving children with other caretakers are situations which routinely occur in most children's lives. Thus, behaviors exhibited under these circumstances are thought to be similar to behaviors exhibited in the child's environment. The final reason pertained to the testing of the hypothesis presented by Loeber (1982) that pervasiveness of aggression (i.e., aggression manifested in a variety of situations) would correlate with stability.

Aggression was coded during the cleanup task, the situation with no toys in the room, during the free-play situation at the end of the assessment, and during specific segments of the Strange Situation Test: when the stranger initially plays with the child, the first separation, the second separation, and the reunion with the stranger. The total coding time was 23 min. During the cleanup task the mother was instructed to have the child put all the toys in a basket. She was permitted to say anything she wished to her child, but was not allowed to actually clean up the toys herself. After 5 min the mother was signaled with a knock to clean up any remaining toys, place the basket outside the lab, and close the door. The no-toys situation began as soon as the basket was placed outside the door. In this task the child had no toys to play with for 3 min while the mother was instructed to work on two questionnaires and attend to her child as she normally would (see Martin, 1981). The Strange Situation Test was administered in the standard format (see Ainsworth & Wittig, 1969), and the free-play situation consisted of unstructured child play while the mother and examiner completed the remaining questionnaires. These segments were conducted identically for the 18- and 24-month assessments.

The behavioral codes for aggression were developed by the authors, based on previous investigations of disruptive behavior in the preschool period. The five codes for aggressive behavior were coded simultaneously during the four lab components of the 18- and 24-month assessments. The first four codes assessed aggression directed at the mother or at the exam-

iners (including both the mother examiner and the "stranger"). These codes included throwing toys at mother, throwing toys at the examiner, hitting or kicking mother, and hitting or kicking the examiner. The fifth code assessed aggression directed at the toys (e.g., pounding or stepping on the popup box, hammering the baby doll) or objects in the room (e.g., hammering the mirror, kicking the door). In addition to coding specific aggressive behaviors, the coders provided a summary rating after completing the coding of a tape, to characterize the behavior of the child throughout the assessment. This 4-point scale—(1) unaggressive, (2) mildly aggressive, (3) moderately aggressive, or (4) severely aggressive—was adapted from Cummings et al. (1989), and modified to enhance compatibility with other classification systems. The global ratings also included acts of aggressive behavior which were socially appropriate such as rough play with the toys (e.g., banging the cars together) or throwing toys into the basket during the cleanup task.

Pearson correlation coefficients were computed between the summed and global ratings of aggression at 18 and 24 months. Both the 18- and 24-month correlations were significant at $p < .01$ ($r = .73$, and .65, respectively), supporting the use of the two ratings as both similar and independent measures of toddler aggression.

Child Noncompliance. Following a system developed by Martin (1981), behaviors that were coded as noncompliance included walking away, changing the task, and struggling or resisting. Noncompliance was coded during three intervals: the cleanup task, and during the last two of the problem solving tasks. During the problem solving tasks the mother was instructed to spend 3 min working with her child on each of three toys: putting colored rings on a pole, putting a puzzle together, and fitting colored blocks and animal shapes in a gazebo toy. The first problem-solving task was used as a warmup and was not coded for noncompliance. The mother was instructed to help the child only if s/he appeared to need it. The total coding time for noncompliant behavior was 11 min.

Data Reduction

Codes for the type of aggression were collapsed across situations into three domains: aggression toward the mother, examiners, or objects in the room. This permitted an examination of the variety and target of aggressive behavior. Similarly, the number of situations in which aggression was exhibited (free play, cleanup, no toys, and strange situation) was coded to allow for the examination of the pervasiveness of the aggressive behavior. Aggression was analyzed as both a molecular, continuous measure of fre-

quency of aggressive acts, and as a molar, categorical variable based on the observer ratings of none, mild, moderate, or severe. In certain segments the variety of aggressive behavior coded was limited, depending on who was present during each component of the laboratory assessment. For example, when the child was alone during one segment of the Strange Situation Test, the only possible type of aggression was that directed at toys or other objects in the room. Since both noncompliance and aggression were coded during the cleanup task, only the noncompliance coded in the two problem-solving tasks was used in the analyses with 18-month aggression.

Undergraduate psychology majors who were blind to the study hypotheses comprised the two coding teams (one team for each behavioral assessment: child aggression and child noncompliance). The teams were trained for 4 to 6 months, during which they attended weekly meetings and completed homework assignments of coding tapes. The length of the training reflected the complexity of operational defining behaviors such as aggression and noncompliance. Since agreement for specific noncompliance codes was relatively low (i.e., walking away and changing the task), coders were instructed to review codes that were unclear with one of the principal investigators.

All raters were supervised by the principal investigators and reliability checks were conducted randomly on 10% of the tapes coded by each rater. In order to establish adequate reliability for aggression and noncompliance, each 5-sec interval was reviewed for the presence or absence of codes. Interrater reliabilities, using kappas, were at or above 85% for all five aggression codes. For the global aggression ratings the kappa was .90. A composite measure of all types of noncompliance was used in the present analysis: The kappa for noncompliance was .71.

RESULTS

Results will be presented in six stages: (1) descriptive statistics for the independent and dependent measures, (2) maternal demographic information, (3) stability of aggression, (4) sex differences in the frequency and stability of aggression, (5) correlates of aggression, and (6) predictive models of aggression.

The descriptive statistics for the global ratings and summed aggression ratings at 18 and 24 months, and the correlates of aggression are presented in Table II. The mean global rating at both 18 and 24 months was *mild* (a rating of 2). Overall, the mean frequency of aggression was low, but the variability was wide. Comparisons were made between African-American

and Caucasians on both global ratings and summed aggression at 18 and 24 months were examined, but no significant differences were found.

The mean for difficult child temperament was 27.39 (Table II), which is similar to the mean of 21.86 reported by Bates (1984). The mean rate of child noncompliance was also consistent with developmental norms. Most children were noncompliant approximately 15 to 20% of the time; however, a few children were chronically noncompliant engaging in noncompliant behavior up to 50% of the coding time. The mean for maternal depressive symptomatology as reported on the BDI was 7.49. This is consistent with the mean reported by Christopoulos and colleagues (1987), using a community sample of low-income mothers (mean = 6.76).

Relations among demographic variables were computed next. Pearson correlation coefficients were examined between maternal age, maternal education, and family income, and both the global and summed aggression scores at 18 and 24 months. Correlations were calculated separately for boys and girls. Although several significant relations were found between maternal age and education and both girls' and boys' global and summed aggression scores at 18 months, only one relation, between maternal age and boys' summed aggression scores, was significant at 24 months. Thus, maternal age was used in the analysis predicting boys' 24-month aggression.

Table II. Aggression and Correlates of Aggression[a]

Variable	N	Mean	SD	Range
Global aggression rating (18 months)	89	2.10	0.80	1–4
Summed aggression (18 months)	89	16.19	25.03	0–151
Global aggression rating (24 months)	89	2.19	0.81	1–4
Summed aggression (24 months)	89	13.09	18.35	0–99
Familial criminality (number of people)	89	0.10	0.30	0–1
Maternal depressive symptomatology (BDI)	89	7.49	6.20	0–29
Child difficult temperament (ICQ)	89	27.39	6.60	10–45
Child noncompliance (observed frequency)	89	102.84	63.73	0–316

[a]BDI = Beck Depression Inventory; ICQ = Infant Characteristics Questionnaire.

Stability of Aggression from 18 to 24 Months

Pearson correlation coefficients were used to examine whether aggression at 18 months would be highly related to aggression at 24 months. Table III summarizes the significant correlations between aggression at 18 and 24 months across different types and situations. Overall, moderate stability was found, particularly for aggression occurring in low or mildly stressful situations. For example, aggression occurring during the cleanup task at 18 months showed the highest correlation with aggression at 24 months. This was true for both the no-stress situation (free play; $r = .26, p < .05$) and the mildly stressful situation (cleanup; $r = .32, p < .01$) at 24 months, as well as for the global rating ($r = .25, p < .05$). Each type of aggression at 18 months (aggression towards objects, mother, or examiners) was correlated with later aggression at 24 months during both the free play and cleanup. Aggression during high-stress situations at 18 months (the no-toys and Strange Situation Test) was not significantly correlated with later aggression. In addition to the significant relations among specific types of aggression and among specific situations, the total summed aggression and global ratings at 18 months were significantly correlated with the global ratings at 24 months.

It was expected that frequency and pervasiveness of aggression would be related to severity. Accordingly, children who manifested aggression in more than two situations and who engaged in more than one type of aggression were expected to show the highest stability. To test this hypothesis, subjects who engaged in more than one type of aggression and in more than two situations were placed in the pervasive group, and the remaining children were placed in the nonpervasive group. Pearson correlation coefficients were calculated to examine the stability of aggression. Using the aforementioned criteria, 17 children (19%) comprised the pervasive group and 72 children (81%) the nonpervasive group. The correlations from 18 to 24 months using both summed aggression scores and global ratings were very strong for the toddlers who demonstrated pervasive aggression at 18 months (range = .57 to .71). In contrast, the correlations for the nonpervasive toddlers were low (range = .05 to .32), and only the comparison between the global ratings at 18 and 24 months yielded a significant correlation. Fisher's Z tests revealed a significant difference between the pervasive and nonpervasive group only for the correlation between summed aggression at 18 and 24 months.

Sex Differences in the Frequency and Stability of Aggression

The base rates of aggression were not expected to differ significantly between boys and girls at 18 and 24 months since previous research on the

Table III. Summary of Significant Correlations for Aggression from 18 to 24
Months (N = 89)

Aggression at 18 months	Aggression at 24 months
	Aggression during free play
Aggression during cleanup	.26[a]
Aggression toward mother	.23[a]
	Aggression during cleanup
Aggression during free play	.26[a]
Aggression during cleanup	.32[b]
Aggression toward examiner	.45[b]
Aggression toward objects	.30[b]
Summed aggression	.32[b]
	Global rating
Summed aggression	.23[a]
Global rating	.30[a]
Aggression during cleanup	.25[a]

[a]Pearson correlation coefficient: $p < .05$.
[b]Pearson correlation coefficient: $p < .01$.

toddler period has not demonstrated sex differences (Zahn-Waxler et al., 1990). This hypothesis was examined using a repeated-measures MANOVA with the global and summed aggression scores at 18 and 24 months as the dependent variables, and gender serving as a covariate. The results revealed no significant differences in the frequency of aggression for boys and girls at 18 and 24 months. There was a slight but nonsignificant increase in aggression for girls from 18 to 24 months. *Post hoc* univariate tests showed that both object-related and summed aggression scores were higher for boys than for girls. These differences, however, need to be interpreted cautiously since the repeated-measures MANOVA was not significant.

The stability of aggression was expected to be higher for boys than girls, since differences in the socialization of boys and girls were expected to result in boys' continued use of aggression and a decrease in aggression for girls (Maccoby, 1980). This was examined by comparing the magnitude of difference between Pearson correlation coefficients for males and females for stability of aggression from 18 to 24 months using Fisher Z Tests, and by chi-square analysis for the stability of the global ratings. Contrary to our prediction, girls and boys demonstrated similar stability of aggression. The global ratings for girls from 18 to 24 months were moderately stable ($r = .35$, $p < .05$). For boys, the correlation between summed aggression at 18 months and global ratings at 24 months was significant ($r = .23$, $p < .05$). The chi-square analysis was significant for girls ($df = 4$, $\chi^2 =$

12.9, $p < .05$), but not for boys ($df = 9$, $\chi^2 = 13.7$, n.s.). The chi-square analysis revealed that a large part of the stability was accounted for by girls who were rated as unaggressive at both 18 and 24 months; 72.7% of the girls rated as unaggressive at 18 months were again rated as unaggressive at 24 months. At the same time, 45% of the mildly aggressive girls and 33% of the moderately aggressive girls received the same rating at 24 months. Thus, while the correlation coefficient for girls was disproportionately affected by the stability of nonaggressive behavior, it also reflected stability of aggressive behavior. Fisher's Z tests revealed that none of the correlations were significantly different between boys and girls.

Correlates of Aggression for Boys and Girls

Correlates of aggressive behavior at 18 and 24 months were examined using Pearson correlation coefficients. The four hypothesized correlates—familial criminality, maternal depressive symptomatology, child difficult temperament, and child noncompliance—were correlated with the summed aggression, the global ratings, and the aggression manifested in specific settings for the total sample, and separately for boys and girls. Results from the correlational analyses for the summed and global ratings of aggression only are shown in Table IV. For the total sample, there were no significant relations between the four hypothesized correlates and the summed and global ratings of aggression at 18 months. However, when the data were disaggregated by sex, several significant relations were revealed (Table IV). For boys at 18 months, there was a significant relation between child noncompliance and the global ratings of aggression ($r = .33, p < .01$). Trends were noted for a positive relation between boys' difficult temperament and both the summed and global ratings of aggression. Results for girls at 18 months were markedly different than those for boys. Nonsignificant, positive relations between maternal depressive symptomatology and aggressive personality were found for girls' summed and global ratings of aggression (Table IV), and these trends were further buttressed by significant relations between aggression during the cleanup task and both maternal depressive symptomatology and maternal aggressive personality ($r = .30, p < .05$, for both). In addition, difficult child temperament and child noncompliance were negatively correlated with girls' aggression. However, these relations were only significant for aggression manifested during specific situations (e.g., during free play; $r = -.32, p < .05$; not shown in Table IV), not for either the summed or global ratings of girls' aggression.

Correlation analyses were repeated with aggression ratings at 24 months. For the total sample, a significant relation was found between fa-

milial criminality and both the summed and the global ratings of aggression ($r = .20, p < .05$; $r = .25, p < .01$, respectively). Child noncompliance was also significantly positively correlated with the global ratings of aggression. These significant relations were maintained and strengthened when the analyses were limited to boys (Table IV). In contrast to the correlations at 18 months, child noncompliance was also a significant *positive* correlate of girls' summed aggression at 24 months ($r = .47, p < .01$). Also in contrast to the data from the 18-month correlations, girls' global ratings of aggression at 24 months significantly *negatively* related to maternal depression ($r = -.34, p < .05$).

Predicting Aggression in Toddlers at 24 Months

In order to determine the best combination of predictors to later aggression, hierarchical regression analyses were conducted using both the summed and global ratings of aggression at 24 months as the dependent variables. Based on the results of the correlational analyses, regressions were computed for boys and girls separately. Maternal age was entered first in the regression equation for predicting boys' summed aggression scores at 24 months because of the significant relation with this variable. In all other regression analyses, the child's contribution was entered first, beginning with 18-month aggression, followed by parental correlates. Interaction terms between the child and parental factors were also examined but were in no case significant. Results for the regression analyses are presented in Tables VA and VB.

Results from the correlational analyses indicated that the best predictors of boys' 24-month aggression, other than 18-month aggression, were child noncompliance and familial criminality. These latter two variables contributed unique variance to the prediction of boys' 24-month global ratings of aggression over and above earlier aggression ratings. The resulting multiple R was .51 ($p < .01$), accounting for 21% of the variance (Table VA). In predicting summed aggression scores at 24 months, only familial criminality, entered into the equation after maternal age and the 18-month summed aggression scores, provided unique variance. The resulting multiple R was .50 ($p < .01$), accounting for 20% of the variance (Table VA).

Results for girls were quite different (Table VB). In predicting girls' global ratings of aggression, maternal depressive symptomatology contributed unique variance, which when entered after the 18-month global rating, resulted in a multiple R of .57, accounting for 29% of the variance. However, maternal depressive symptomatology was *negatively* related to later aggression. In developing the best model to predict girls' summed aggres-

Table IV. Correlates of Aggression at 18 and 24 Months

	Boys (n = 52)				Girls (n = 37)			
	18 months		24 months		18 months		24 months	
	Summed	Global	Summed	Global	Summed	Global	Summed	Global
Familial criminality	.17	-.01	.40ᶜ	.34ᶜ	.13	.08	.10	.10
Maternal depressive symptomatology	-.12	-.06	-.00	.17	.25ᵃ	.27ᵃ	-.07	-.34ᵇ
Difficult child temperament	.20ᵃ	.20ᵃ	-.05	.05	-.15	.06	.14	.14
Child noncompliance	.21ᵃ	.33ᵇ	-.05	.35ᶜ	-.19	.19	.47ᶜ	.09

ᵃPearson correlation coefficient: $p < .10$.
ᵇPearson correlation coefficient: $p < .05$.
ᶜPearson correlation coefficient: $p < .01$.

Table VA. Hierarchical Multiple Regressions: Predicting Aggression at 24 Months for Boys (n = 52)

Step	Independent variable	Multiple R	Adjusted R^2	F	Significant F change
	Dependent variable: global aggression at 24 months				
1.	Global aggression (18 months)	.22	.03	2.54	.12
2.	Child noncompliance (18 months)	.37	.10	3.84	.03
3.	Familial criminality (history)	.51	.21	5.57	.002
	Dependent variable: summed aggression at 24 months				
1.	Maternal age	.31	.08	5.47	.02
2.	Summed aggression (18 months)	.33	.07	3.00	.06
3.	Familial criminality (history)	.50	.20	5.23	.003

Table VB. Hierarchical Multiple Regressions: Predicting Aggression at 24 Months for Girls ($n = 37$)

Step	Independent variable	Multiple R	Adjusted R^2	F	Significant F change
	Dependent variable: global aggression at 24 months				
1.	Global aggression (18 months)	.35	.10	5.00	.03
2.	Maternal depressive symptomatology (18 months)	.57	.29	8.22	.001
	Dependent variable: summed aggression at 24 months				
1.	Summed aggression (18 months)	.004	-.03	0.00	.98
2.	Child noncompliance (18 months)	.49	.19	4.92	.01

sion at 24 months, child noncompliance was the only correlate that pro-
vided significant variance over and above earlier aggression ratings. The
multiple R for this analysis was .49, accounting for 19% of the variance
(Table VB).

DISCUSSION

The results from the present study provide preliminary evidence for
the existence of precursors to externalizing behavior problems beginning
in the toddler years. Although sex differences were not found in the fre-
quency or stability of aggression from 18 to 24 months, there were marked
differences in the factors significantly related to boys' and girls' aggression.
Overall, the mean rate of aggression was within a normal range for tod-
dlers. However, the variability indicated that, by this age, some children
were engaging in very high rates of both object-related as well as interper-
sonal aggression. As with school-age children, moderate stability of aggres-
sion (from 18 to 24 months) was found. The correlations were strongest
for aggression occurring in situations identified as not stressful or mildly
stressful. Thus, unprovoked aggression proved more stable than provoked
aggression. This finding is similar to reports by Zahn-Waxler and colleagues
(1990) on the stability of "dysregulated aggression." Furthermore, toddlers
whose aggression was pervasive demonstrated significantly higher stability
from 18 to 24 months than toddlers whose aggression was limited to few
settings or to only one type. Again, this finding is similar to those reported
for school-age children and adolescents. These similarities between the con-
tinuity of toddler and school-age children's aggression argue for the exami-
nation of behavior manifested during the toddler years as a precursor to
later externalizing behavior problems.

There were few differences in the frequency and stability of aggres-
sion between boys and girls. Both sexes engaged in more object-related
aggression than interpersonal aggression. Although stability was expected
to be higher for boys, the results for the two sexes were similar. These
findings on the lack of significant sex differences in toddler aggression
is consistent with results reported by Rose, Rose, and Feldman (1989),
who found no differences on the broadband Externalizing factor of the
TBC.

While the lack of sex differences in the frequency of aggressive be-
havior is consistent with other investigations during the toddler period
(Rose et al., 1989; Zahn-Waxler et al., 1990), it is inconsistent with the
rates of later externalizing behavior problems among school-age and ado-
lescent boys and girls (American Psychiatric Association, 1987). The data

presented here suggest that, from the toddler period to later childhood, differences in socialization practices may lead to changes in the way girls manifest their behavior problems, and consistency in the way boys manifest theirs. For example, Maccoby, Snow, and Jacklin (1984) described significant differences in maternal responsiveness to difficult girls versus difficult boys during a problem-solving task; mothers of difficult girls were rated as more responsive than mothers of difficult boys. It is possible that mothers put more effort into controlling their difficult daughters' behavior because of society's unacceptance of aggression in females. To explore this hypothesis, the results from the prediction of girls' aggression will be discussed first, followed by the results for boys.

In the present study, both child noncompliance and child difficult temperament were negatively related to girls' aggression at 18 months. Although this finding appears paradoxical, based on Maccoby and colleagues' (1984) findings, mothers may perceive their girls' noncompliance and difficult temperament as signs of worsening behavior (i.e., aggression). In order to prevent further behavior problems, mothers may increase their level of responsiveness, resulting in a corresponding decrease in their daughters' aggression. The fact that, in this study, negative relations with aggression were found for both independent observations of noncompliance, as well as maternal perception of child difficultness, provides further support for the interpretation that maternal behavior may be a moderating factor. How then to account for girls' changes from 18 to 24 months in the relation between noncompliance and aggression? For some girls, despite maternal efforts to discourage problem behavior, noncompliance may eventually escalate to the use of aggression. Additionally, depending on maternal characteristics, responsiveness to child aggression may be manifested in an increase in mother's positive attention toward her daughter, or in harsh punishment. The latter response may contribute to later child aggression at 24 months. Although the data from the present study indicate that maternal response to aggression may be a significant correlate of aggression for girls, supplementing observational data with parental reports is recommended for testing such a relation in future research.

The complex findings regarding maternal depression and girls' aggression were unexpected. Maternal depressive symptomatology was positively related to aggression at 18 months, but negatively related at 24 months. One possible explanation for this finding may come from examining the developing formation of internalizing and externalizing problems for girls. For example, in two studies of the effect of family conflict on school-age children's adjustment, rates of psychopathology in girls were found to be equal to or greater than those of boys, but only when internalizing problems were also assessed (Christopolous et al., 1987; Furstenberg & Allison,

1989). In this study, the negative correlation between maternal depressive symptomatology and girls' aggression may have indicated a transition in the manifestation of behavior problems from externalizing to internalizing. The magnitude of change in the relation between maternal depressive symptomatology and girls' aggression from 18 to 24 months is still surprising, and alternative hypotheses should be explored.

While the relations for girls' aggression were complex, the message is clear. In order for a developmental model to further our understanding of aggression and externalizing problems, it must consider each factor as dynamic and interactional. For girls, noncompliant behavior must be understood in the context of the relationship between the mother and child, and in the context of the child's environment, in order to explain its negative relation with concurrent aggression and positive relation with later aggression.

For boys, the strongest predictors of aggression were child noncompliance and familial criminality, which is consist with both social learning theory and a behavioral–genetic model of the development of antisocial behavior. A social learning theorist might argue for parental modeling as the mechanism of action. On the other hand, from the behavioral–genetic perspective, familial criminality may represent a biological predisposition which is manifested in child disruptive behavior. However, the lack of correlation between familial criminality and aggression at 18 months suggests that the relation is more complex. As with the data for girls, an interactional model needs to be imposed that accounts for changes in the meaning of factors over time. Although familial criminality may influence the child's aggression at a genetic level by increasing the probability of the occurrence of aggressive behavior, once the behavior is expressed, it is responded to, and the socialization process of aggression is initiated. A history of criminal behavior is likely to influence a parent's socialization of his/her child's aggressive behavior. Thus, the relation between aggression and familial criminality may be stronger when the child has reached a developmental period at which the parent begins to discipline his/her child for misbehavior. The data from the present study support such an interactional model. Familial criminality may provide a biological predisposition for early aversive child behavior. Later, at 24 months, when these behaviors lead to struggles with the parent, the child's use of aggression may be reinforced by a parent's aggressive or harsh behavior.

Several limitations should be considered when interpreting these results. First, the sample size is small. This is a particular problem when conducting comparisons between boys and girls. In addition, although the sample was comprised of an approximately equal number of African-Americans and Caucasians, analyses controlling for both sex and race were

not feasible due to the sample size. Second, debate exists concerning the validity of toddler aggression in terms of its relation to later externalizing behavior problems. The resolution of this issue must be deferred until longitudinal data, which spans child development from the toddler period to school age, is available. A longitudinal analysis which includes both the toddler and school-age periods would also allow for the assessment of changes in the manifestation of aggression over time, including peer-related aggression. Until further assessments are conducted, the data from the present study must be interpreted within the context of the toddler years. This study, therefore, is presented as a first step toward understanding the developmental precursors of child externalizing behavior problems.

Despite these limitations, this study suggests that there is evidence to support the continued examination of gender-specific models for the development of behavior problems in toddlers. Additional longitudinal research is necessary to provide a link between data emerging in the toddler years and later school-age aggression. On the one hand, the results demonstrate similarities in the frequency of boys' and girls' aggression, but on the other hand, they underscore how socialization experiences potentially lead to differences in the etiology and later patterns of behavior problems. For both boys and girls, the results of the present study are meant to generate testable hypotheses. Developmental models must allow for changes in the manifestation of aggressive behavior, changes in the factors which contribute to the initiation and maintenance of aggressive behavior, and differences in the socialization experiences of boys and girls.

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