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Parent–Child Interaction and Conduct Disorder

Frances E. M. Gardner[1]

This paper reviews recent research on the role of parent–child interaction in the etiology of children's conduct disorder. It examines the role of social and family factors in conduct disorder and the possible mechanisms by which these contextual factors might affect parent–child interaction and child problem behavior. A major focus is on research that has compared the patterns of interaction in families with and without conduct-disordered children, using observational methods, in order to test different theoretical explanations about how conduct disorder develops and is maintained. Further research is needed on the neglected area of positive parent–child interaction, which may be just as important as conflictual processes in determining the development of conduct disorder. Theoretical and methodological issues are raised about the problems of determining causality from correlational research, and the possibilities for naturalistic experimental studies are discussed.

KEY WORDS: parent–child interaction; conduct disorder; observational methods; child disorders.

INTRODUCTION

This is a review of research on the role of parent–child interaction in the etiology of children's conduct disorder (CD), with particular reference to studies that have systematically observed these interactions. I will begin with a discussion of some of the problems in defining CD and a brief exposition of some of the challenges facing research in this field. A particular challenge is how to establish causal mechanisms when most studies merely report correlations between family characteristics and children's CD. Before embarking on the major topic of this paper, I will review

[1]Department of Education, University of Warwick, Coventry CV4 7AL, England.

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epidemiological and clinical studies of the wider social context in which families and their children with CD operate. Mechanisms by which these social factors (e.g., maternal depression and social isolation) might influence parent–child interaction and child problem behavior will then be considered. A review of the literature on observational studies of parent–child conflict will follow. This will focus on research that has compared families of children with and without CD, in order to test hypotheses about which kinds of parent–child interactions are causally important in CD. How do these patterns of interaction develop, and how do they help to promote child problem behavior? Does CD develop because of parents' lack of consistent discipline, or because of their excessive criticism, demands, or harshness toward the child? The final section will review a much more neglected area, namely positive interaction in families in which children have CD. Questions will be raised about how harmonious interactions between parent and child may help to prevent problem behavior. Does parental warmth, playfulness, availability, and responsiveness to the child's needs contribute to children's positive adjustment? The discussion section will suggest future directions for research, including possible solutions to the problem of how to test causal hypotheses.

DEFINITION AND SIGNIFICANCE OF CONDUCT DISORDER

Conduct disorders in children are a common and intractable problem, creating difficulties for families, for the school system, and for the wider community. They are strongly associated with academic and family disadvantage, and with later delinquency (Loeber, 1990). The outlook for adult adjustment is particularly poor (Robins, 1978) for those with childhood CD.

Children with CD exhibit a wide range of behaviors that can be classified as antisocial to some degree, such as aggression, temper tantrums, disobedience, destructiveness, rudeness, defiance, lying, restlessness, and disruptiveness at school. To be considered as conduct-disordered, children need to show several of these behaviors, persisting for at least 6 months and occurring more frequently than in most children of the same age. This definition will be used in the present paper, because it has wide empirical support. The above cluster has been validated in numerous factor-analytic studies (see Quay, 1986a, for a review), using data from a range of sources and with children of different ages (Achenbach, 1966; Hewitt and Jenkins, 1946; Mattison *et al.,* 1980; Peterson, 1961). Such studies have consistently revealed a cluster of intercorrelated items that can be labeled CD and that is distinct from an anxious-withdrawn cluster.

Further evidence for the validity of this cluster is provided by longitudinal studies that demonstrate CD tends to be highly persistent over time, in contrast to anxious-withdrawn disorders, which are more transient. Similar results have been found using definitions derived from factor-analysis (Achenbach and Edelbrock, 1981; Fischer *et al.,* 1984; Richman *et al.,* 1982), definitions based on psychiatric classifications (Robins, 1966, 1978), and in studies (Campbell and Ewing, 1990) using clinically defined groups of preschool children with relatively mild CD (see Loeber, 1982, for a review).

Problems of Definition in Conduct Disorder

Although CD is empirically distinct from anxiety disorder, there is much confusion about terminology and about the existence of different subtypes within the category of conduct disorder. Different terms are frequently used to describe the same cluster of behaviors, such as coercive, antisocial, oppositional, and disruptive. Children exhibiting this cluster are variously described as being hard to manage, noncompliant, aggressive, deviant, and as having behavior problems. Frequently, children are selected from different sources, using differing definitions, which can lead to difficulties in making comparisons across studies. However, there are a number of possible solutions to this problem.

One solution is to use a formal psychiatric classification system such as DSM-III-R (American Psychiatric Association, 1987). This system divides CD, as empirically defined above, into two categories, Oppositional Defiant Disorder, and Conduct Disorder (CD). CD is further subdivided into three subtypes, according to whether the antisocial behavior occurs primarily in groups, is solitary and aggressive, or is a mixture of these types. The great merit of such a system is that, if adopted by all researchers, it can lead to consistency of labeling and definition across studies.

However, this classification system (and its predecessor, DSM-III, 1980) has been subject to much criticism, mainly because of lack of empirical support for a distinction between the above categories and subtypes (Loeber and Lahey, 1989; Loeber and Schmaling, 1985; McMahon, 1987; Quay, 1986a; Schachar and Wachsmuth, 1990; Werry *et al.,* 1987). For example, the list of antisocial acts constituting DSM-III-R criteria for CD includes many serious delinquent acts, which apply mainly to older children, such as stealing, running away overnight, firesetting, housebreaking, and forcing sexual activity on others. This list bears little resemblance to the factor-analytically derived cluster described at the beginning of this section. Thus, DSM-III-R criteria would exclude many younger children

with troublesome and persistent behavior problems manifested in the home, even though the prognosis for these children is poor. Many of these children would instead be diagnosed as showing the less severe Oppositional Defiant Disorder which includes criteria such as tempers, arguing, defiance, annoying others, and spitefulness, occurring with greater frequency than in most children of the same mental age.

The category of Oppositional Defiant Disorder has been criticized for not being empirically distinct from the DSM-III-R category of CD (McMahon, 1987; Werry *et al.,* 1987). Schachar and Wachsmuth (1990) attempted to validate the distinction between CD and Oppositional Disorder in DSM-III. They compared clinic-referred 7- to 11-year-old children in each of these diagnostic categories on a number of measures of associated child and family psychopathology and disadvantages. Both groups also were compared with normal controls. Their results suggested that children with Oppositional Disorder were similar to those with CD in the frequency of associated problems in areas such as peer and family relationships, learning disability, and paternal psychopathology. Both diagnostic groups differed from the normal group in these respects. The authors concluded that their findings provided little support for a distinction between the two disorders as defined in DSM-III, and they suggested that Oppositional Disorder is merely a less severe variant of CD.

Because of these problems with DSM-III definitions, the definition adopted here will use the empirically-derived cluster described previously. This has the advantage of resembling more closely the definitions adopted in many studies of parent–child interaction and CD, which often involve younger children (Campbell and Ewing, 1990; Dumas, 1986; Forehand and McMahon, 1981; Richman *et al.,* 1982; Webster-Stratton and Hammond, 1988) It also avoids making an unvalidated distinction between the categories of conduct and oppositional disorder, which the current evidence suggests may well represent a continuum of severity of CD rather than distinct categories (Schachar and Wachsmuth, 1990; Werry *et al.,* 1987).

Development and Persistence of Conduct Disorder

Not surprisingly, there are developmental differences in how these troublesome behaviors manifest themselves (Loeber, 1990). In the early years, CD tends to develop within the context of parent–child and sibling relationships. Later in childhood there are opportunities to branch out into antisocial behavior in other settings, where bullying, vandalism, and stealing may occur. There also are very different expectations for children at different ages. For example, frequent temper tantrums at age 2, although

stressful for parents, are considered quite normal. At age 5 the same tantrums may constitute cause for concern. Despite the variety of behaviors clustered together under the label "conduct disorder," there are commonalities in these behaviors across different ages. This is because all these antisocial acts involve some kind of violation of age-appropriate social rules and because they are distressing or painful to others. They also tend to provoke hostile, irritable, punitive, or avoidant reactions from others. Moreover, there is evidence that individual conduct problems tend to persist over the years (Achenbach and Edelbrock, 1981; Graham and Rutter, 1973; Loeber and Stouthamer-Loeber, 1987; Robins, 1978; Schachar *et al.,* 1981), even when they begin in the preschool years (Campbell and Ewing, 1990; Richman *et al.,* 1982). For example, Campbell and Ewing (1990) followed up children referred at 3 years of age because their parents were experiencing difficulties in managing their tantrums, defiance, and overactivity. The authors found that 67% of this sample still had externalizing disorders at age 9, severe enough to conform to DSM-III criteria for attention deficit, conduct, or oppositional disorder.

ISSUES IN THE ETIOLOGY OF CONDUCT DISORDER

Multiple Causes

There is good evidence that the causes of behavioral disorders are likely to be multifaceted (Rutter, 1985). Although the emphasis here is on the etiological role of family interaction, I do not mean to imply that school or constitutional differences are unimportant; rather they are outside the scope of this review.

For example, a number of studies have demonstrated the importance of classroom social interaction and school management as determinants of problem behavior in schools (Mortimore *et al.,* 1988; Rutter *et al.,* 1979). These school effects hold even when child and family background characteristics at the time of school entry are taken into account.

Individual differences in children's learning styles (Daugherty and Quay, 1991; see Hogan and Quay, 1984, for a review), temperament (Plomin, 1983), and genetic make-up (Quay, 1986b; Rutter *et al.,* 1990) are likely to influence whether children develop CD. Indeed these factors may interact with parenting styles to potentiate the development of disorder (Rutter, 1978). The interaction between temperament and parent behavior has been the subject of much research and will be discussed in the next section. In contrast, there has been relatively little research investigating

the relationship between parent behavior and children's learning styles or genetic make-up.

Problems of Determining Causality

Traditionally, many researchers have assumed that correlations between parenting practices and child behavior reflect the influence of parent upon child (Lytton, 1990). For example, a number of classic studies of childrearing patterns found a correlation between parental use of punitive methods of discipline and child aggression (Becker, 1964; Sears *et al.,* 1957). These early researchers tended to interpret their findings as showing that parental punitiveness causes children to be aggressive. However, a number of more recent authors have pointed out that these correlations may reflect child effects on adults (Bell and Harper, 1977) or complex interactions between child and parent effects (Lytton, 1990; Rutter, 1985)

Effects of Child Temperament

A possible mechanism by which children may exert these effects on adult behavior is through individual differences in temperament. We know from studies, such as that by Thomas *et al.* (1968), that differences between children in behavioral style can be detected early in infancy, and that these can be reliably measured, and that they show some degree of stability over time. Some studies have shown that negative temperamental characteristics in the child's first and second year predict later behavior problems (Lee and Bates, 1985; Wolkind and DeSalis, 1982).

For example, Lee and Bates (1985) carried out a longitudinal study of over 100 normal children first assessed at 6 months of age. They measured temperament during the first year, using a well-validated maternal questionnaire (the Infant Characteristics Questionnaire) which assesses the child's reactions to common stimuli, their emotions, and activity level. A consistent factor, which they termed "difficultness," emerged from their analyses. This was comprised of items concerning the mother's perception of the child's moodiness, fussiness, amount of crying, and emotional intensity. They found that difficultness at 6 and 12 months predicted problem behavior at age 2 and 3, as measured by direct observations of mother–child conflict and by maternal ratings (Bates *et al.,* 1985). The same predictions held at 5, 8, and 10 years (Bates, 1991) when CD was measured by maternal report using the Child Behavior Checklist (Achenbach and Edelbrock, 1983). The authors concluded that difficult temperament in infancy may contribute to the development of later child CD. These difficult infants are

more likely at age 2 to engage in conflictual interactions with their mothers, implying that children may influence the way that mothers deal with them. Evidence for possible child effects from this and other studies (Plomin, 1983; Rutter, 1987; Sanson *et al.,* 1991) should make us cautious about assuming causal directions on the basis of correlations between child and parent behavior (Anderson *et al.,* 1986). This issue is raised at various points in the paper, and possible solutions are put forth.

SOCIAL FACTORS IN CONDUCT DISORDER

Epidemiological studies with large, representative samples allow us to look at the patterns of association between behavior problems and social factors. This method contrasts with controlled clinical studies, where highly selected subjects, such as those referred to psychiatric clinics, are compared with matched subjects who do not show the same clinical problem.

Epidemiological Studies of Family and Social Factors

The classic British epidemiological study of children's disorders is that of Rutter *et al.* (1970), who studied families with 10- and 11-year-olds in the semi-rural Isle of Wight. They measured CD using a combination of instruments of established reliability, including structured psychiatric interviews with children and parents and a standardized questionnaire for teachers and parents. Family and social circumstances were assessed using structured interviews with parents. The authors found that a set of "family adversity factors" were consistently related to child CD. These factors included poor housing, low employment status, marital discord, paternal criminality, and maternal mental illness.

Rutter *et al.* (1975) carried out a second study, this time of a deprived inner-city area of London, using the same methods as in the Isle of Wight. Although they found double the rate of conduct disorder in London, the pattern relating family adversity factors to child disorder was closely similar (Rutter, 1978). In both parts of the country, children who suffered a greater number of adversity factors were at greater risk of developing CD. Moreover, there appeared to be an interaction effect of these stressors: Where several of these factors were present, there was a disproportionately increased risk of disorder. To a large extent, the difference between London and the Isle of Wight in overall rate of CD was explained by the greater frequency of adversity factors in London (Rutter, 1978; Rutter *et al.,* 1975).

In epidemiological studies of younger children, results have been found that are broadly similar to those for Rutter's 10-year-olds. A study in London by Richman *et al.* (1982), and one in the U.S.A. by Barron and Earls (1984), found that preschool CD was linked to marital discord, maternal depression, and poor housing. Richman *et al.* (1982) also looked more closely at maternal interaction and attitudes toward the child, assessed through observer ratings during interviews carried out in the family home. The researchers found that factors such as maternal criticism, irritability, and low warmth toward the child were more strongly related to the presence of CD than were global social factors, including low social class, poor housing, and marital discord. These are interesting findings, hinting at the possibility that interactions between parent and child may be at least as important as the wider social environment in determining child outcomes. Richman *et al.* did not measure child temperament, although one might expect that this variable would interact with adverse social conditions, causing further stress to parents and engendering negative parental attitudes and behavior toward the child.

Studies of Clinic-Referred Children

Maternal Depression

In common with epidemiological research, studies of clinic-referred groups also have found maternal depression to be associated with child CD (Griest *et al.,* 1980; Webster-Stratton, 1988). However, one might expect that a mother's depressed mood would color her perception of whether the child was difficult enough to warrant referral to a clinic. Depression also influences how negatively mothers view their child's behavior when completing rating scales, which are frequently the main measure of CD (Webster-Stratton, 1988). Several studies have questioned whether the association between depression and CD is a genuine one, or whether depressed mothers merely appear to have more difficult children, because they perceive the child's behavior more negatively (Brody and Forehand, 1986; Conrad and Hammen, 1989; Dumas *et al.,* 1989; Friedlander *et al.,* 1986; Webster-Stratton and Hammond, 1988). Many of these studies have tried to circumvent this potential confound by using independent measures of child behavior, such as direct observations, rather than relying primarily on maternal reports as in many of the epidemiological studies reviewed earlier.

For example, Webster-Stratton and Hammond (1988) studied 95 clinic-referred children with CD, half of whom had depressed mothers.

Independent measures of problem behavior were obtained from standardized questionnaires given to teachers and fathers and from direct observations in the home. Home observations and father reports suggested that children of depressed mothers were equally difficult as those of their non-depressed counterparts, indicating that depressed mothers do not somehow "imagine" that their children are difficult. Nevertheless, their findings also showed that depressed mothers perceived their children as being more difficult than did fathers and teachers. This suggests that a combination of maternal depression and actual child behavior contribute to mothers' judgments about the child, a conclusion supported by the studies of Brody and Forehand (1986) and Conrad and Hammen (1989).

Maternal Social Isolation

A few studies have examined the link between maternal social isolation and CD. Within a clinic-referred sample, Dumas and Wahler (1983) and Wahler (1980) identified a group of mothers they called "insular" and whose children had CD. Insularity was defined on the basis of a brief structured interview with mothers, repeated on several occasions, asking them about the frequency and nature of their social contacts in the preceding 24 hours. Insular mothers were those who, on average, reported a low proportion of pleasant social contacts or a high proportion of daily contacts with helping agencies and relatives, rather than with friends. The insularity measure was found to be highly reliable over repeated occasions. Dumas and Wahler (1983) found that insular mothers tended to experience more difficulty in carrying out effective interventions with their child during therapy than did non-insular mothers. This was evidenced by higher rates of drop-out from therapy and failure in either making or maintaining treatment gains. The children of insular mothers also were more difficult than were those of non-insular clinic attenders, as measured by rates of aversive behavior during home observations (Dumas and Wahler, 1985). The next section looks in more detail at the mechanisms through which social factors such as maternal depression and isolation might influence child behavior.

MECHANISMS LINKING SOCIAL FACTORS TO FAMILY INTERACTION

An important question concerns the mechanisms by which these adverse social circumstances exert their effects on parent–child interaction and, in turn, on child behavior. Patterson (1982) drew together research from a

number of sources to develop a model of possible causal pathways. He suggested that both chronic adversity (e.g., poverty, marital discord) and more temporary crises can have a direct effect on the mother's mood. By becoming more irritable, negative, withdrawn, or hopeless, mothers are less able to deal consistently and effectively with their children, for instance by monitoring their whereabouts, enforcing rules, encouraging the child's appropriate behavior, and finding constructive solutions to crises (Patterson, 1982, p. 219). These difficulties can in turn have a direct effect on the level of child problem behavior. He further suggests that family stresses may in some cases have a direct influence on mothers' management practices.

Impact of Maternal Depression on Parent–Child Interaction

Support for these mechanisms is provided from a number of studies. Direct observations of depressed mothers and their young children suggest that, compared to their non-depressed counterparts, depressed mothers tend to be more irritable, miserable, inconsistent, and unresponsive with their children (for reviews, see Gelfand and Teti, 1990; Puckering, 1989; Rutter, 1990). It is difficult to conclude that such maternal behaviors contribute directly to child problem behavior, as Patterson (1982) hypothesizes, because many of the purported effects may in fact represent bidirectional patterns. Patterson's (1982) model pays much less attention to child effects, such as temperament, than to family stress and interaction patterns. For example, the depressed mother's irritability may increase the child's problem behavior. But a temperamentally difficult child may increase mother's sense of irritation and helplessness and may affect her management practices. These may in turn influence the child's behavior in a continuous pattern of reciprocal influence (Lytton, 1990).

Another factor complicating investigation of mechanisms by which depression affects children's CD is that depression is not a unitary phenomenon. Some depressed mothers may be agitated and irritable, provoking difficult behavior in their child, whereas others may be quiet and withdrawn, thus provoking the child less than if their mood were normal. This heterogeneity is reflected in the findings of Cox *et al.* (1987), whose sample of depressed mothers showed wider variability in behavior toward their preschool child than did a non-depressed group. Contrary to expectations, some studies have found that children are less difficult on occasions when their mothers are more depressed. Hops *et al.* (1987), using a sample of 52 depressed and non-depressed mothers and their normal children, attempted to improve on studies which merely correlated depression with overall rates of maternal and child behaviors. They used home observations to calculate

the probability of maternal expressions of depressed affect being followed by child problem behavior. Interestingly, they found that both children and fathers were less likely to be irritable, noisy, and rude following mothers' expressions of sadness, self-derogation, and complaint. The same did not apply when mothers were irritable or sarcastic. This raises the possibility that the influence of depression on child behavior is more complex than at first thought (Rutter, 1990). Some aspects of depressive behavior may contribute to child problem behavior, whereas other aspects may suppress it.

Dumas *et al.* (1989) found that in a group of mothers whose children had CD, depressed mood correlated with lower rates of child problem behavior, as measured by systematic observations in the home. In contrast to this finding, maternal depressed mood correlated positively with previous specialist referral of the child, parental ratings of stress on the family, and parental ratings of child problem behavior. Dumas *et al.* (1989) speculated that these results, together with those of Hops *et al.* (1987), reveal the children are selective about where they exhibit their maladjustment, being less difficult with their mothers and more difficult in other contexts, such as outside the home and with their fathers. The latter point was supported in a further study by Dumas and Gibson (1990) who found that CD children with depressed mothers exhibited more difficult behavior toward their fathers than toward their mothers, whereas the reverse was true for children with CD whose mothers were not depressed.

Dumas *et al.* (1989) recommended caution in interpreting these results. The findings are based on correlational analyses and on a sample of mildly depressed mothers, defined by their scores on the Beck Depression Inventory (Beck, 1982). Although this is a well-validated scale, it is unclear whether the same results would be obtained from a clinically depressed sample. There is also the problem of the heterogeneity of depressive behavior. Hops *et al.*'s (1987) study is intriguing because it implies that variations in the mother's depressive behavior (e.g., irritability vs. sadness) may have an immediate effect on the child. Future studies need to measure this variability in depressive phenomena through direct observations of maternal behavior and through more sophisticated measures of her emotional state (Rutter, 1990) and, in turn, relate these to variations in child behavior. This would help to elucidate which aspects of depressive symptomatology affect child CD.

The Impact of Maternal Social Isolation on Parent–Child Interaction

One way of trying to ascertain causal mechanisms is to see if changes in maternal behavior toward the child follow closely in time after the onset

of particular family stressors. Dumas (1986) investigated the impact of insular mothers' social interactions outside the home on the quality of interaction in the home. Mothers were visited on ten occasions, and direct observations were made of their interaction with their child. Mothers also were interviewed about the frequency and nature of their adult contacts outside the home that day. Dumas found that on days when they had engaged in unpleasant encounters with neighbors or welfare agencies, mothers were more likely to go home and behave more irritably to the child. More pleasant social encounters outside the home (and these made up barely half of all encounters) appeared to have an inhibitory effect on mother's irritability at home. It is important to note that these variations in mother's behavior were independent of the level of the child's problem behavior, making it unlikely that the results merely reflect child effects. The immediate temporal sequence of events built into the design of this study is certainly supportive of Patterson's (1982) hypothesis of a causal relationship between stresses on the mother and increases in her aversive behavior to the child.

What we cannot tell from this study is how much in the long term the child's problem behavior was affected by these variations in the mother. A limitation of the insularity measure is that a mother's report of the negative or positive valence of her recent social contacts might well be affected by her mood. Thus, a depressed mother might interpret a social encounter as unpleasant, whereas someone else might interpret it more positively. Alternatively, depression could contribute to unsuccessful social encounters, which could then be accurately reported by the mother as negative. Her depression also could cause her to be more irritable with the child. Dumas (1986) is cautious in concluding from this correlational study that negative social contacts cause child CD, because variations in depressed mood could be the main contributor to unsuccessful social interaction, both in and outside the home.

Impact of Divorce on Parent–Child Interaction

Hetherington *et al.* (1982) looked at the effects of a more severe and prolonged family stress, namely divorce, on parent–child interaction and CD. They carried out a longitudinal study of 72 children from recently divorced families who were attending nursery school. Follow-up occurred at 2 months, and at 1 and 2 years after the divorce. These families were compared with a group of intact families, matched on variables such as social class, sex, age, and birth order of the child. A range of methods were used to assess family functioning and child behavior, including parental interviews, diary

records, ratings of child behavior problems, and direct observation of parent and child in the laboratory.

Hetherington *et al.* (1982) found a high degree of concordance among results from different assessment methods. At 2 and at 12 months following divorce, mothers were less affectionate to their children and more inconsistent and ineffective in their discipline than were mothers in intact families. Mothers were particularly more negative toward sons than toward daughters. There were concomitant increases in child conduct problems, most markedly in sons, who showed high rates of noncompliance, aggression, and whining both during home and laboratory observations and according to parental records and rating scales.

An interesting question concerns the mechanisms by which divorce might have an impact on children's behavior. A plausible explanation is that the observed changes in the divorced parent's behavior toward the child contribute to the development of CD. Hetherington *et al.*'s longitudinal data provided some support for this hypothesis. Using cross-lagged panel correlations, they found that on some measures negative behavior by mothers at 2 months post-divorce predicted child behavior problems at 12 months post-divorce, whereas the reverse predictions were not supported. The results suggested that the effects of child behavior on mother negativity were causally less important than were mother effects on the child. Nevertheless, this interpretation can only be tentative, because cross-lagged correlations have been much criticized for involving unwarranted assumptions, such as that the two variables measured are equally stable over time (Rogosa, 1980). Such data are not available from Hetherington *et al.*'s paper.

One limitation of most divorce studies is that researchers are not able to compare parent–child interactions that occur before with those that occur after the break-up. Many of the differences found between divorced and non-divorced families in Hetherington *et al.*'s study may result from family conflict that preceded the divorce, rather than the divorce *per se.* This interpretation is supported by a recent study by Jenkins and Smith (1991) who investigated a general population sample of intact families with and without severe marital discord, as defined by interview measures of established reliability and validity (Quinton *et al.*, 1976). They found high correlations between overt parental conflict, poor parental management of the child, and child CD. As with Hetherington's study there were problems of causal interpretation, which Jenkins and Smith (1991) suggested might be solved through longitudinal designs, that examine whether parental quarrels precede changes in child management and whether these precede or follow deterioration in the child's behavior.

These studies represent some preliminary attempts to test models of the mechanisms that link global social factors to detailed parent–child interaction. Next, I turn to some tests of hypotheses about the nature and role of parent–child interaction in CD. Because there is a limit to what can be discovered from correlational studies, I will also review some attempts to use experimental designs to answer causal questions.

PARENT–CHILD INTERACTION IN FAMILIES WITH AND WITHOUT CONDUCT-DISORDERED CHILDREN

This section seeks to understand what aspects of parent–child interaction contribute to the causation and maintenance of conduct-disordered behavior in children. The usual method for approaching this is to compare interactional processes in families with and without CD children, using systematic observations.

Parent and Child in Conflict

This section will concentrate particularly on the work of G. R. Patterson (1976, 1982, 1986) and his group in Oregon who have perhaps made the greatest contribution to understanding family process in conduct problems (see Dowdney, 1985; Hetherington and Martin, 1986; Robinson, 1985; Wells, 1984; Yule, 1978 for reviews and critiques). Patterson's work is built around a social learning theory framework, which stresses that problem behavior in the family is learned through modeling and reinforcement, primarily during quarrelsome interactions between family members. He suggests that a primary characteristic of problem behaviors is "that they demand [or coerce] a reaction from the environment and very often these consequences are reinforcing" (Patterson *et al.*, 1967, p. 1). In this way, the child and other family members become enmeshed in habitual cycles of unpleasant interaction, which Patterson (1980, 1982) suggests are maintained primarily through negative reinforcement.

Patterson has tested his theory through direct observation of family interaction in the home. His group's observational system (Patterson, 1982; Reid, 1978) was developed both to test predictions about the role of family interaction in determining CD and to measure change in behavior of family members following clinical intervention. The stream of behavior is broken up into fine-grained behavior categories (29 in all), recorded every 6 seconds in turn-taking fashion. There is an emphasis on negative and controlling behavior, such as "yell," "hit," "disapprove," "noncomply," and so

forth. For the purposes of many of their analyses, these negative categories are lumped together into a higher-order category of "aversive behavior." Other categories are positive or neutral in tone, such as "talk," "comply," "affection," and so forth. By analyzing the relationship between adjacent pairs of behaviors, this observational system yields information about immediate antecedents and consequences of problem behavior.

Subjects for Patterson's observations consisted of families where children (between ages 3 and 13) were referred to their center for help with CD. Matched non-problem families were recruited and observed in order to make group comparisons.

Using this kind of method, many differences in family interaction between CD and non-CD groups have been found. As one might expect, children with CD engaged in higher rates of aversive behavior than did their normal counterparts. The same pattern was found for their parents and siblings, supporting Patterson's idea that the whole family system is disrupted (Patterson *et al.,* 1984). Most difficult behavior occurred not as isolated events but in continuous sequences of conflict, which Patterson (1982) termed chains or bursts. These bursts tended to be longer and more frequent in the CD group. Mothers of children with CD were more likely than were their normal counterparts to react negatively to these outbursts, by shouting, nagging, and threatening. Unfortunately these attempts at discipline were not always effective. Whereas the normal child was likely to stop when reprimanded, the child with CD was more likely to persist in his outburst (Patterson, 1976, 1982). These unsuccessful disciplinary attempts may turn the child's chain of unpleasant behavior into a mutually coercive interaction, involving two or more family members.

Once parent and child are enmeshed in these coercive sequences, it becomes difficult to disentangle which are child and which are parent effects on the length and patterning of these chains (Maccoby and Martin, 1983). Patterson (1982, pp. 111, 163) suggested that parental effects are particularly salient here. He hypothesized that coercive chains are more prolonged in the CD group because parents are inconsistent at following through with their commands and because they rarely back them up with sanctions. Parental stress and irritability also may contribute to the prolongation of coercive chains, by making it more difficult for parents to set consistent limits and by directly irritating the child.

Patterson (1976, 1982) suggested that the main underlying mechanism maintaining these chains is negative reinforcement. This is a process whereby a behavior is strengthened because it leads to termination of an unpleasant event. For example, when a mother repeatedly nags her son to wash his hands before a meal, his tantrum and refusal to do so is rewarded because she stops nagging and he gets out of having to do this tiresome

task. She is also negatively reinforced for giving in to him, because this buys peace and quiet. Another kind of example begins with the child's demands. When a father gives in to his daughter's tantrum in the supermarket, by buying the chocolates she has been demanding, his capitulation is negatively reinforced because the public tantrum ends. In this example, the child is positively reinforced for her tantrum, because she gets the chocolate. Patterson (1980, 1982) suggested these kinds of patterns are particularly likely to become habitual, because there is a pay off, at least in the short term, for both participants. In the long term, though, trouble is stored up; the child learns to repeat his tantrum and the parent his capitulation.

Thus, Patterson's (1982) theory predicts that much problem behavior represents an attempt to remove the unwanted intrusions of others, including their nagging, demanding, or criticizing. It "works" for the child with CD either because he is especially persistent at this or because the parent gives in particularly easily, or both.

How much evidence is there that children with CD are more likely to be reinforced for their problem behavior than are their normal counterparts? Is this more likely to be negative or positive reinforcement? Patterson (1976, 1982) has tested this by computing the probability of each aversive child behavior being followed (or preceded) by particular parental behaviors. The evidence suggests that positive reinforcement cannot account for the maintenance of problem behavior, because parents of CD children are no more likely to supply a positive reaction to individual aversive behaviors than are their normal counterparts (Patterson, 1976, 1982, pp. 98-100; Snyder, 1977). One problem with these studies is that behaviors defined as positive for the purposes of an observational coding system (e.g., compliance, affection, or approval) may not be the only parental reactions that are reinforcing for the child. When parents get angry with a child who is misbehaving, it may be positively reinforcing for some children because angry attention is preferable to being ignored. It is a limitation of all such coding systems that it is not possible to define the personal meaning of social events for the particular individuals being observed. It is, however, possible to conclude from these studies that parents of CD children are not providing unusually high rates of overtly positive consequences for their child's deviant behavior.

Next we turn to negative reinforcement. If this is an important process in the causation of problem behavior, then one would expect a high proportion of aversive child behavior to be preceded by others' annoying intrusions. To test this, Patterson (1982, pp. 98, 149) computed the probability of any child-aversive behavior being preceded by another family member's aversive behavior. Aversive behavior was a composite category, made up of several individual behaviors (e.g., yell, hit, threaten, etc.) as defined

earlier in this section. Patterson found that child-aversive behavior was preceded by similar behavior from other family members on only about one-third of the occasions in the CD group, and on about one-quarter of the occasions in the control group, a difference which did not quite reach significance. These data do not therefore support the notion that most problem behavior serves to ward off unwanted intrusions. However, it should be noted that although the proportion of problem behavior stimulated by others does not differ between groups, the frequency of these intrusions does. Patterson (1982, p. 149) found that children with CD suffered three times as many aversive initiations by their mothers as did children in the normal group, findings that are more consistent with Patterson's claim for the role of negative reinforcement.

The studies described in the last two paragraphs suffer from two main drawbacks. First, they used composite categories of "aversive" and "positive" behavior. Thus, all detail about the specific behaviors within the sequence of conflict is lost, such as whether the child makes a demand that starts off the conflict, or whether the parent complies with this at the end. This is relevant because parents may not provide loving consequences for the child when she misbehaves, but they may well comply with her demands in order to buy peace and quiet, thus positively reinforcing the child's outburst. Second, since the unit of analysis was the relationship between adjacent pairs of behaviors, Patterson's system can only analyze parental reactions to each child behavior in the chain. To discover whether children are reinforced for problem behavior, it is more important, however, to know the outcome of the whole sequence of conflict. Thus, in the "supermarket" example, reinforcement for the child came from finally getting the chocolate rather than from the parent's reaction to each child behavior. However, it is normally these pairs of behaviors and reactions that are analyzed in Patterson's system rather than the whole sequence of conflict.

Gardner (1987, 1989) used a home observational method that attempted to overcome both these drawbacks. The hypothesis tested was that mothers of children with CD would be more likely than their normal counterparts to capitulate to their child's wishes during conflict, thus providing the conditions for reinforcement of the child's problem behavior. Second, it was predicted that when parental capitulation did occur, it would be more likely to take place under conditions where the child could be negatively reinforced. This would be the case during a conflict that had begun with a parental demand (as in the "wash hands" example above), because the child might wish to remove such a parent-initiated intrusion.

Both these predictions were borne out in Gardner's (1989) study of preschoolers with CD and matched controls. Compared to control group mothers, CD group mothers were nearly eight times more likely

to capitulate by failing to follow through on their stated demands to the child. Moreover, there was a high correlation between the rate of mother capitulation and the frequency of conflict within a family. Mothers of children with CD were much more likely to capitulate when the conflict episode began with a mother command than when it began with a child demand. Thus, the problem child was much more likely to be negatively reinforced for persistent refusal to comply (as in the "wash hands" example) than to be positively reinforced for his persistent demands (as in the "supermarket" example). In the control group, mother capitulation was so rare that it was impossible to detect differences in capitulation rate across types of conflict episodes. These findings support some of the central tenets of Patterson's (1982) theory, namely that negative reinforcement in the form of escape from parental demands and, to a lesser extent, positive reinforcement in the form of parental compliance may be important factors maintaining child problem behavior in the family.

Indiscriminate Caretaking

Wahler and Dumas (1986) have put forward an alternative hypothesis, based on the notion of "indiscriminate caretaking," to explain how CD is reinforced and maintained. They argued that many children with CD live in a family context where the reactions of parents are very unpredictable. This unpredictability results from parents offering indiscriminate responses to the child, such as sometimes reacting negatively when the child is behaving appropriately. Wahler and Dumas suggest that this unpredictability is aversive to the child and that one way to escape this situation is to engage in problem behavior, because this would tend to elicit relatively predictable negative responses from the parent. Thus, the child's problem behavior would be negatively reinforced because it reduces the unpredictability of the parents' responding.

Support for Wahler and Dumas' (1986) hypothesis that mothers of children with CD are more indiscriminate comes from observational studies by Patterson (1976) and Snyder (1977), who used Patterson's observational system described earlier. These studies found that, compared to a matched group of normal children, conduct-disordered children were more likely to receive indiscriminate responses from their mothers, including aversive reactions to their appropriate behavior. Snyder's (1977) analyses of conditional probabilities showed that mothers' reactions to their conduct-disordered children could not easily be predicted from the child's behavior, whereas the reactions of mothers of normal children were more closely dependent on the child's behavior.

Wahler and Dumas (1986) used a small sample of children with severe CD and their mothers to carry out detailed sequential analyses of the relation between child and mother behavior. They found that mothers' behavior became more predictable by becoming more aversive during bursts of child problem behavior. Unlike Gardner's (1989) findings, Wahler and Dumas found little evidence that mothers were giving in to their child's demands during sequences of conflict. They also found little support for Patterson's hypothesis that the child is reinforced for difficult behavior because it helps ward off unwanted intrusions from parents. Instead, most conflict sequences were initiated by child demands. The authors interpreted the findings as providing some support for the hypothesis that child problem behavior is reinforced by reduction of mother's unpredictable behavior rather than by her compliance to the child's wishes. However, Wahler and Dumas pointed out that this was not only a small sample but an unusual one because the mothers were markedly depressed and socially isolated. Other mothers might be more proactive in initiating behavior (e.g., making demands) toward the child, and under such conditions negative reinforcement would result for the child who succeeds in fighting off such demands. This could account for discrepancies in the results of different studies. To further test Wahler and Dumas' hypothesis, similar studies are needed that compare normal and CD groups to see if indiscriminate responding by caretakers, and changes in the predictability of their responses during child outbursts, are more common in families with conduct-disordered children.

Wahler and Dumas' work has the great merit of linking interactional processes within the family to those taking place in the wider social networks that impinge on the family, as discussed earlier. Dumas and Wahler (1985) found that within a clinical sample, indiscriminate caretaking was related to mother's insularity. They suggested that this is because the behavior of insular mothers toward their child is affected by aversive social exchanges outside the family, rather than primarily being contingent on the child's behavior and needs.

Parent and Child in Harmony

Theories such as Patterson's that focus on conflictual interaction in the family have been subject to some criticism. Many have argued that his theory concerns only one type of parent–child interaction, namely conflict. However, there are many other things that parents and children do together that might have a bearing on whether children come to develop CD (Gardner, 1977; Robinson, 1985). Even in families with a conduct-disordered child, less than 20% of interactions involve some degree of

conflict (Gardner, 1987). One would expect that the quality of interactions during the other 80% of the day, such as the mother's availability, her responsiveness to the child's efforts to engage her in play (Parpal and Maccoby, 1985), and the warmth of their relationship, might all help to reduce the likelihood of problem behavior (Dowdney, 1985). Dowdney *et al.* (1984) have suggested that joint play between parent and child provides a particularly good vehicle for the learning of these more harmonious styles of interaction, and it is this aspect of positive interaction that many researchers have examined.

Conduct Disorder and Positive Activities

The first step is to see if there is any overall relationship between CD and the type of interaction that takes place when parent and child are not in conflict. For instance, if joint play helps to cement harmonious parent–child relationships, then one would expect a lower frequency of joint play in conduct-problem families. There are a few studies investigating this question. Dunn and Kendrick (1982), in a normal sample of pre-school children, found an inverse relationship between joint play and (non-clinical) behavior problems. Thus, mothers and children who played more together also tended to fight less often. Gardner (1987) investigated differences between CD and normal preschoolers in a range of non-conflict activities. She found that normal children spent nearly three times as much time in joint play, and twice as much time in joint conversation with their mothers, compared to their CD counterparts. The children with CD spent more time in relatively unconstructive activities, such as watching T.V. alone and aimlessly wandering or fiddling. Pettit and Bates (1989) found that in a non-clinical sample of 4-year-olds there was a high correlation between mothers' positive involvement with the child and a low rating of child problem behavior.

An important question, which cannot be answered from the above findings, concerns the causal relationship between positive interactions and CD. Patterson (1982, p. 233) hypothesized that habitual conflict in families eventually causes a breakdown in family relationships and a reduction of pleasant shared activities, such as joint play between parent and child. Gardner's (1987) data do not support this view of chronic CD leading to later loss of shared activities, because marked differences in family activities were found at such an early age. Longitudinal studies come somewhat closer to indicating causal relationships. Pettit and Bates (1989) attempted to answer exactly this question, using a longitudinal design. Children were observed in their homes during their first, second, and third years of life and were followed up at age 4, when problem behavior was assessed using

a standardized parent checklist. They found that early measures indicating paucity of affectional and "educative" interactions between mother and child were predictive of high rates of problem behavior at age 4. In contrast, early mother negativity did not predict 4-year-old behavior problems, although early ratings of "difficultness" by mothers did. The authors concluded that early positive interactions are likely to be just as important as negative ones in determining whether later CD occurs. Taken together, these results provide little support for Patterson's (1982) claim that family conflict has the primary causal role in determining other (non-conflictual) aspects of interaction.

Conduct Disorder and the Quality of Joint Play

So far this paper has concentrated on global measures of the amount of positive interaction between parent and child and its possible role in CD. A second important issue concerns the quality of interactions, such as joint play. For instance, is there any evidence suggesting which aspects of joint play help to build harmonious relationships between parent and child? There is very little literature comparing CD and normal groups in the quality of their joint play. However, there is a great deal of literature on normal interaction that suggests variables that are thought to be indicative of healthy parent–child relationships. For example, authors such as Maccoby and Martin (1983) and Dowdney *et al.* (1984) have suggested that such "high-quality" interactions will involve mutual expressions of warmth and enjoyment and evidence of mutual interest and cooperation. Others have stressed the importance of the parent's skill at structuring joint activity so as to keep it going, and their skill at using control which is subtle and sensitive (Dunn and Kendrick, 1982; Schaffer and Crook, 1979). Studies that analyze the sequential patterns within the stream of behavior can yield information about who starts joint play and about how the other person responds to these initiations (Dowdney *et al.*, 1984; Gardner, submitted; Pettit and Bates, 1989).

Some of the few studies that relate these dimensions to CD will now be reviewed. Pettit and Bates (1989), in their study of 4-year-olds, found that mothers of children with relatively severe behavior problems rarely initiated joint activity with the child. This cannot be explained simply in terms of the child being uninterested in playing with the mother, because these more difficult children actually made more positive overtures to their mothers than did the "easier" children. They also found that mothers were more likely to ignore the bids of these difficult but contact-seeking children. Similar results were found by Gardner (submitted) in an observational

study of joint play episodes in preschoolers with CD. She found that mothers of conduct-disordered children initiated a much smaller proportion of joint play episodes than did their normal counterparts. Thus, in the normal group, mothers initiated most of the joint play, whereas in the CD group the reverse was true. Mothers of problem children were less responsive than their children to suggestions made by the other during play and contributed a much smaller proportion of suggestions than did normal mothers. This set of results suggests that many mothers of conduct-disordered children are relatively less skilled at, or less interested in, getting involved in their child's play.

It may well be that maternal depression contributes to this low involvement in play. It is a drawback of these studies that they did not measure this variable. However, depression is unlikely entirely to account for these group differences, because other research examining the effects of depression on maternal behavior suggests that depressed mothers show smaller and more subtle differences in joint play with their preschooler than have been reported here (Mills *et al.,* 1985; Puckering, 1989). It seems plausible that the combination of having a temperamentally difficult child and living in the kind of social conditions which predispose one to depression puts mothers most at risk for having difficulties in both positive and negative interaction with their child.

Parpal and Maccoby (1985) have suggested that this low maternal responsiveness to the child's initiations plays a major causal role in child non-compliance. They argue that it is not so much the consistency of parental discipline that produces biddable children, but the mother's willingness to meet the child's reasonable demands and to justify those refusals that are necessary. In this way, they argue, willing child compliance develops, based on a reciprocal or "tit-for-tat" understanding between parent and child. Several studies have shown a correlation between maternal responsiveness and child compliance (Clarke-Stewart, 1973; Maccoby and Martin, 1983), but they allow no conclusions to be drawn about causal connections.

To advance the understanding of the causes of CD, experimental studies are needed. These can avoid the charge of being unnaturally contrived by manipulating variables which have been shown to correlate with conduct problems in real-life observations. Such studies may then demonstrate that particular parent behaviors can have a genuine influence on child problem behavior. Parpal and Maccoby's (1985) study of normal 3- to 6-year-old children is notable because it attempts to do just that. They carried out an experimental test of the influence of maternal responsiveness on child compliance. Mothers were trained to be especially responsive to the child during play and to reduce the number of demands they made on

the child. Child compliance to a cleaning-up task was then tested. The results showed that these children were more compliant than were those in another experimental condition who played in a "normal" way with their mothers. These results need to be treated with caution because the two groups were not given equal amounts of prior training in play. Hence, the result might have been due to other differences between the groups, such as quantity of play experience, rather than to training in responsive play as such. Nevertheless, their experiment points the way for testing the causal role of variables whose importance is suggested from naturalistic correlational studies.

IMPLICATIONS AND FUTURE DIRECTIONS FOR RESEARCH

A robust finding in this field is that children with CD are likely to come from homes with multiple social and family disadvantages. An important question addressed in this paper is that of how parent–child interaction might serve as a mechanism which links these adverse social conditions to CD. Some promising research was reviewed that begins to suggest how depression, social isolation, and marital breakdown might affect parental behavior, and in turn, child CD. The work of Dumas and Wahler (1985) is notable because it draws attention to interactions outside as well as inside the family. Together these studies of social factors have important implications for practitioners. They suggest that for intervention to be successful with the parent–child dyad, it may be necessary to intervene in other systems such as the marital and extra-familial relationships. Studies such as Dumas' (1986), which begin to specify the nature of faulty interactions in extra-familial systems, are likely to be of great help to practitioners.

Much of the research literature assumes a one-way influence of social and family factors on child behavior. An alternative hypothesis is that child temperament influences parental disorder and marital satisfaction, which in turn may affect the quality of social relationships outside the family. Future research needs to integrate temperament into models of social disadvantage and CD. Longitudinal studies are needed which track the development of maternal depression and difficult child temperament from birth and the influence that these have on other social relationships.

The problems entailed in testing causal hypotheses about social influences on children's behavior form a general theme of this paper. Causal conclusions are particularly difficult to draw in a field where almost all of the work is correlational in nature. Some ways of enhancing these techniques have been noted, such as longitudinal (including cross-lagged correlations)

and sequential designs. For example, Dumas' (1986) data collected across a time span of hours suggested that mothers' experiences outside the home had an influence on their subsequent behavior to the child. Relationships between adjacent behaviors in short-term sequences have frequently been used to suggest immediate causal influences (e.g., studies by Patterson 1982; Gardner, 1989, submitted; Wahler and Dumas, 1986). Ultimately, causal tests can only be carried out by using experimental interventions, but the importance of correlational techniques is that they inform researchers about which naturally occurring variables should be experimentally tested, as in the Parpal and Maccoby (1985) study referred to earlier.

There are many examples of intervention techniques that have been evaluated in controlled studies (Forehand and McMahon, 1981; Patterson and Reid, 1973; Webster-Stratton *et al.*, 1989; Yule, 1978). It is clear from these studies that altering parent–child interaction has some kind of causal influence on child CD. However, because these outcome studies evaluated the effects of a whole package of changes in parent behavior, they are not pure experiments, and it is not possible to tell which variable or which combination of variables effected change in the child. For example, many intervention packages employ a combination of training in maternal praise and responsiveness during joint play, teaching parents to apply consistent sanctions for misbehavior (Forehand and McMahon, 1981). It is important to isolate which ingredients are causally most important, both because of theoretical reasons and because only then can practitioners understand and begin to improve the effectiveness of therapeutic interventions.

One limitation of intervention experiments is that they usually involve testing for parent effects on children, and thus there is a danger of underestimating child effects. Anderson *et al.* (1986) drew attention to evidence for child effects from drug treatment studies. For example, Barkley and Cunningham (1979) found that when child behavior became less difficult, mothers become markedly less controlling toward the child. Anderson *et al.* (1986) reported an ingenious experiment where mothers of CD and normal children interacted with their own child and with children from both groups who were not their own. They found that differences in mother negativity and child compliance depended primarily on which group the child belonged to (i.e., CD or normal) and not on which group the mother belonged to. They concluded that aversive interactions are mainly driven by the child. It could be argued from Gardner's (submitted) data that during harmonious interactions the child with CD also tends to take the lead, this time in a positive way, by initiating a greater proportion of the joint play episodes than would the normal child, and by being more responsive than their mothers to suggestions about how to extend the game.

Another major theme of this paper has been that both conflictual interaction and positive family relationships must be investigated in order to fully understand the etiology of CD. Evidence is beginning to accumulate that deficits in parent–child interaction during play appear quite early in children with CD. They are, therefore, unlikely to be merely a consequence of CD but, as Maccoby and Martin (1983) argue, may play a major etiological role. Future research needs to refine our hypotheses about the crucial elements of positive parent–child interaction and to test these in experiments. Such findings would have important implications for what is taught to parents during therapy.

Robinson (1985) takes a more radical view. She argues that because Patterson's theory focuses essentially on relationships between observable events, it constrains understanding of CD. A wider range of phenomena could be understood by developing a more cognitive theory, which builds on Patterson's work and which integrates concepts such as parent–child attachment, parental perception of the child's behavior, and expectations and attributions of family members. These too may be promising pathways for future research.

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