Childhood Depression and Conduct Disorder: I. Behavioral, Affective, and Cognitive Aspects of Family Problem-Solving Interactions

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Abstract

We assessed the family interactions of depressed, conduct-disordered, mixed depressed–conduct-disordered, and nonclinic children, ages 7–14 years, during a standardized family problem-solving discussion in the clinic. The child's and the mother's problem-solving proficiency, aversive behavior, and associated affective behavior (depressed and angry–hostile) were observed. The child and mother also rated each other's affect during the interaction for the dimensions sad, angry, critical, and happy on Likert-type scales. The child's and mother's cognitive constructions about the interaction were assessed using videomediated recall. Although all clinic groups had lower levels of effective problem solving than did nonclinic children, their deficiencies were somewhat different. Mixed and depressed children displayed high levels of depressed affect and low levels of angry affect, whereas conduct-disordered children displayed both angry and depressed affect. In addition, conduct-disordered children had lower levels of positive problem solving and higher levels of aversive content than did non-conduct-disordered children. Depressed and conduct-disordered children had higher levels of self-referent negative cognitions than did mixed and comparison children, and depressed children also had higher other-referent negative cognitions than did all other groups. The study provides support for theories and treatment that stress the importance of family problem-solving and conflict resolution skills in child psychopathology.

Research on childhood depression has mushroomed in recent years. This research shows that affective disturbance in children is a complex, multidetermined phenomenon involving a combination of genetic vulnerability, biochemical disturbances, and psychosocial factors (Kazdin, 1990; Rutter, 1986). There is considerable speculation, but little solid evidence, that disturbed patterns of family interaction play a role in the etiology or maintenance of childhood depression (Burbach & Borduin, 1986; Cole & Rehm, 1986).

Family interactions may affect the nature and course of childhood depression via several interacting mechanisms. First, family conflict can constitute a source of stress that increases the risk of depression, precipitates or prolongs an episode of depression, or predicts relapse after successful treatment (Goodyer, 1990). In the clinical literature, depressed children are
often assumed to be exposed to a hostile, critical, rejecting family environment, in which marital discord, parental depression, and parental hostility are common. However, no firm conclusions regarding the nature and causal significance of family conflict in childhood depression can be drawn, because direct observational studies of the family interactions of depressed children have been limited.

Second, depressive or distress behaviors may be developed and maintained by social interactions within the family. For example, a parent may model, prompt, or reinforce distress behaviors such as sullenness, withdrawal, irritability, crying, or complaining and provide low rates of positive attending to prosocial behavior, particularly if the parent is also depressed (Downey & Coyne, 1990; Gelfand & Teti, 1990). For example, Cole and Rehm (1986) found that mothers of depressed children rewarded their children at lower rates than did mothers of clinic nondepressed and normal children in an experimental laboratory setting. They also set higher performance standards for rewarding their children.

Third, depressed children and their parents may lack effective conflict resolution and interpersonal problem-solving skills. During family interactions, children may display distress behaviors (e.g., dysphoric or angry affect, facial expression, and posture) or negative communication behaviors (e.g., looking away, accusations, and self-denigration). There is some evidence in adults that depressive behaviors suppress hostility in family members (e.g., Hops et al., 1987). In children, depressive behaviors may generate either reciprocated interactional negativity from a parent (e.g., impatient, critical, or hostile behavior) or withdrawal. These interaction patterns presumably prevent rational resolution of family conflict via effective problem solving (Robin, 1981) and could serve to maintain the child's depression.

In observational research on the family interactions of clinically disturbed children, two main approaches have been used: structured, clinic-based observation during family problem-solving discussions (Borduin, Henggeler, Hanson, & Pruitt, 1985) and naturalistic observations in the home (Patterson, 1982). However, there have been few studies in which these methods have been used to assess depressed children. In the present study, we used structured clinic observations of interaction patterns during family problem-solving discussions, and in a second study (Dadds, Sanders, Morrison, & Rebgetz, 1992) reported elsewhere in this issue, we used naturalistic mealtime observations.

Several authors have argued for the importance of problem-solving skills in the treatment of behavioral and emotional disturbance in children and adolescents (Alexander, 1973; Borduin et al., 1985; Dodge, 1985; Kazdin, Esveldt-Dawson, French, & Unis, 1987; Kendall & Braswell, 1985; Robin, 1981). Children with antisocial behavior problems frequently lack interpersonal problem-solving skills, and several studies (e.g., Kazdin et al., 1987) have indicated the usefulness of problem-solving training in the treatment of children with conduct disorders. However, it is unknown to what extent depressed children display deficits in interpersonal problem solving and how their affective behavior influences their interactions with parents during discussions of family problems.

Research on the role of cognitive factors in depression has focused largely on whether children display the same kind of maladaptive attributional style evident in depressed adults (e.g., Curry & Craighead, 1990). Depressed children have been shown to attribute positive events to external factors and negative events to internal factors and to have a sense of hopelessness (e.g., Benfield, Palmer, Pfefferbaum, & Stowe, 1988; Kaslow, Rehm, Pollock,
Siegel, 1988; Seligman & Peterson, 1986). Benfield et al. (1988) found that a depressogenic attributional style for positive life events differentiated between depressed and nondepressed children; however, attributions for negative events did not differentiate between depressed and other clinically disturbed children. These authors suggested that cognitive variables may not be specific to depression in children, but may be related to the presence of psychopathology in general. However, no studies have examined depressed children's constructions of interactions with parents.

Two important but neglected aspects of children's cognitive processing of their interpersonal interactions with others are (a) how they perceive and interpret the affective behaviors of other family members and (b) what cognitions they formulate during stressful interactions. Disturbed children may selectively attend to or misinterpret their parents' verbal and nonverbal behavior during discussion of sensitive topics in ways that promote conflict or prevent the resolution of family problems (e.g., interpreting a parent's mildly negative comment as being highly critical). Depressed children may perceive their parents as being more critical, sad, or angry than they actually are, as judged by independent observations. Conversely, parents of disturbed children in general and of depressed children in particular may misperceive their child's affect by either overestimating or underestimating the child's distress behaviors. In the present study, we sought to clarify the extent to which a child's and parent's perceptions of each other's affect corresponded to independent observations of the child's and parent's affect.

Most researchers investigating cognitive variables have employed questionnaire measures that require children to endorse a list of experimenter-generated thoughts, cognitions, or self-statements. This approach to assessment views cognitive characteristics as being traitlike and ignores potentially important contextual variables (e.g., the ongoing behavior of another family member and the topic of discussion) that elicit cognitive processes (Halford & Sanders, 1988). An alternative context-specific method of cognitive assessment called videomediated recall involves showing a subject a video replay of the subject's interaction with a family member and periodically stopping the tape to probe for the subject's thoughts or cognitions that were occurring at the time. Research (e.g., Halford & Sanders, 1988) using this instrument has shown that the content of resulting self-statements can be reliably analyzed. Because no studies have assessed children's “on-line” cognitive constructions of their own family interactions, we examined the potential utility of this form of assessment with children and their parents to determine the nature of depressed children's cognitive construction of significant relationship events.

Children with conduct disorders are an important comparison group in studying the roles of interactional processes and cognitive variables in child depression. A great deal is already known about conduct-disordered children's family interactions and poor interpersonal problem-solving skills (Patterson, 1982), and many depressed children also experience concurrent antisocial behavioral problems (Puig-Autich, 1982). The use of nondepressed clinical comparison groups enables one to explore the disorder-specific nature of identified family interaction and cognitive variables.

In this study, we aimed to extend the literature on family interaction in depression and conduct disorders by comparing the interactions of depressed, conduct-disordered, mixed depressed–conduct-disordered, and nonclinic children during family problem-solving discussions in the clinic. Specifically, we assessed a child's and parent's problem solving, interactional negativity, affective behavior, and perceptions of each other's affect. We
hypothesized that depressed children would display greater levels of dysphoric affect and lower levels of angry–hostile affect during conflictual interactions with parents than would conduct-disordered children, whose predominant affect would be hostile–aggressive. We predicted that children with mixed depression–conduct disorder would show both depressed and angry–hostile affect. We also predicted that depressed children (with and without concurrent conduct disorder) would be more likely to cognitively distort their parents' affect and would engage in higher levels of negative cognitions about themselves than would conduct-disordered children. Conduct-disordered children would have more externally directed negative cognitions about their family during problem solving than would depressed children.

**Method**

**Subjects**

Thirty clinically depressed and 27 conduct-disordered children were recruited from the intake of the Behaviour Research and Therapy Centre at the University of Queensland and the Child and Family Therapy Unit of the Royal Children's Hospital. Twelve of the depressed children had another diagnosable conduct disorder in addition to depression; these constituted the mixed group. Sixteen nonproblem children (the comparison group) were recruited through announcements in the local media. Thus the design of the study corresponded to a $2 \times 2$ factorial comparison with four groups: depressed–non-conduct-disordered, depressed–conduct-disordered, nondepressed–conduct-disordered, and nondepressed–non-conduct-disordered children.

A child psychiatrist or an experienced clinical psychologist initially evaluated each child using the Schedule for Affective Disorders and Schizophrenia for School Aged Children—Epidemiological Version (Puig-Antich, Orvaschel, Tabrizi, & Chambers, 1983) structured diagnostic interview. Although we did not formally assess the reliability of diagnostic classification, each case was formally presented at a case conference where specific diagnostic criteria met by the child were checked by a team of psychiatrists and clinical psychologists to ensure that each patient met the inclusion criteria for the study. If the patient met the criteria for major depression, dysthymia, adjustment disorder with depressed mood, or conduct disorder in the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1987) and was between the ages of 7 and 14, he or she was considered for inclusion in the study. The consent of both patients and parents to participate in the research was obtained.

Subjects were excluded if they had any medical condition contributing to their problem, were on psychotropic medication, were mentally retarded or suffering from a developmental disorder, or were in therapy with other therapists. Each family's socioeconomic status was assessed using procedures described by Daniel (1983) that base social class on the type of occupation an individual holds. Social classes range from 1 (e.g., solicitor) to 7 (e.g., blue-collar worker).

Table 1 summarizes the demographic variables. A series of one-way analyses of variance (ANOVAs) showed no significant differences between the groups on the variables child's age, mother's age, father's age, or father's occupation ($p > .05$). The only significant variable was mother's occupational status, $F(3, 60) = 3.74$, $p < .05$, in that the comparison-group mothers had slightly higher occupational status than did mothers in the clinic groups. In
preliminary data analyses of dependent variables, we employed the mother's occupational status as a covariate in all multivariate analyses of variance (MANOVAs); however, because the covariate failed to reach statistical significance, these results are not reported. It is unlikely these differences substantially affected the pattern of results obtained.

**Self-Report Measures**

Five self-report measures were used to objectively document the degree of psychological disturbance in subjects in the four groups. The Child Depression Inventory (CDI; Kovacs & Beck, 1977) is a 27-item inventory based on the Beck Depression Inventory. Items reflect affective, cognitive, and behavioral symptoms related to depression. The CDI has high internal consistency (e.g., Cronbach's $\alpha > .80$), moderate test–retest reliability, and good discriminant validity and correlates with related constructs such as self-esteem, hopelessness, and negative cognitive attributions (Kazdin, 1990). The Bellevue Index of Depression—Modified (BID—M; Kazdin French, Unis, & Esveldt-Dawson, 1983) is a 26-item inventory on which parents rate the presence or absence and severity of depressive symptoms in their children (on a 5-point scale) and the duration of each symptom (on a 3-point scale). Parents' level of marital satisfaction was measured with the Dyadic Adjustment Scale, a widely used marital adjustment inventory that has been found to discriminate reliably between distressed and nondistressed couples (Spanier, 1976).

The Revised Behavior Problem Checklist (Quay & Peterson, 1984) is an 89-item inventory on which parents rate the severity of a range of behavioral symptoms and problem behaviors in their children on a 3-point scale. It contains numerous subscales, including Conduct Disorder (CD), Socialized Aggression (SA), Attention Problems—Immaturity (AP), Anxiety—Withdrawal (AW), Psychotic Behavior (PB), and Motor Excess (ME). The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used to assess levels of depression in parents. It has 21 items that assess motivational, somatic, and interpersonal symptoms. Its psychometric properties are well established.

**Assessment of Problem-Solving Interaction**

Families were observed in the clinic during a standardized problem-solving discussion. Each mother–child pair was instructed to engage in a 10-min problem-solving interaction. Before this, each participant completed an Issues Checklist (Robin, 1981), which contained a list of 44 potential sources of conflict between parents and children (e.g., curfew, chores, and smoking). One of two versions of the checklist was employed, depending on the age of the child. For children under the age of 11, we replaced items on the original checklist that
primarily related to problems of adolescents (e.g., dating) with items appropriate for 7- to 11-year-olds. For children 12 years and older, the original checklist was employed. For the first 5 min, the mother and the child discussed a current family issue concerning the child that was nominated by the parent as causing distress in the family. For the second 5 min, an issue of concern nominated by the child was discussed. The mother and child were instructed to discuss the problem and attempt to find solutions. Each interaction was videotaped.

These videotaped recordings were scored using the Depression Observation Schedule (DOS; Sanders & Dadds, 1989). The DOS consists of two verbal categories of problem-solving behavior—positive solution and aversive content—and two affect codes (depressed affect and angry affect) that represent participants' accompanying nonverbal affective behavior. The problem-solving codes were derived from an adaptation of the Kategoriensystem für Partnerschaftliche Interaktion coding system (KPI; Hahlweg et al., 1984), similar to the one used by Behrens, Sanders, and Halford (1990) to assess marital interaction during problem solving. The categories were modified to be suitable for use with mother–child discussions. Abbreviated definitions of the categories are as follows:

The positive-solution category was defined as appropriate verbal problem-solving behavior consisting of either a positive constructive proposal for change or a compromise solution to the problem being discussed by either the child or the mother.

The aversive-content category included the following subcategories: (a) Criticism: This category covered comments that were intended to hurt, demean, or embarrass, the other person and comments that expressed dislike or disapproval of a specific behavior of the other person. (b) Negative solution: This category was coded when the speaker described something he or she would like the other person not to do in order to solve the problem. (c) Justification: This category included justifying one's own behavior or denying of any responsibility for the problem (“It's not my fault. I didn't do it”). (d) Disagreement: This category included direct disagreements, “yes, but” statements, short disagreement statements, or blocking-off statements.

The affective codes were based on the subject's nonverbal behaviors including his or her facial expression, voice characteristics, and body posture. Depressed affect was defined as follows: (a) Facial expression included downcast eyes, lowered eyebrows, down-turned mouth, or a facial expression of displeasure. (b) Voice characteristics included a fearful, lamenting, depressed, mournful, or morose tone; crying; tremor; or whining. (c) Body posture included not being oriented toward, withdrawing from, not facing, or moving away from the other. The category of angry affect included the following: (a) Facial expression included a mocking, sneering, angry, or disgusted expression or demonstrative looking away. (b) Voice characteristics included a cold, tense, impatient, tough, piercing, staccato, accusing, sarcastic, outraged, mad, or offensive, tone; screaming; or a scornful laugh. (c) Body posture included clenched hands; abrupt cutting-off gestures; passiveaggressive blocking-off of the other person; or tense or impatient movement of hands and feet (e.g., tapping fingers on the chair).

Each 10-min observation session was divided into thirty 20-s time blocks. Observers scored the presence or absence of each category during observation intervals. The measures derived from the observation system were the percentage of intervals of positive solution, negative content, depressed affect, and angry affect, calculated separately for the child and the mother.
Observers were unaware of each family's diagnostic status and the hypotheses under investigation. One observer scored all tapes; a second scored a randomly selected one third of tapes to assess interrater reliability. The interrater reliability (kappa) across all DOS codes was .70. The reliabilities for all four subcategories exceeded their corresponding chance levels of agreement.

Cognitive Measures

On completion of each problem-solving discussion, each pair completed videomediated recall. Each subject watched a replay of the interaction the pair had just completed. The experimenter paused the tape every 20 s and instructed the subject to verbalize into a tape recorder his or her thoughts at that point in the interaction. The pause lasted 20 s, and then the next 20 s of interaction was played. The timing and duration of the pauses were based on work by Halford and Sanders (1988) that suggested that longer pauses produced redundancy in reported cognitions. Children's elicited cognitive constructions of their interactions were content analyzed in a fashion similar to that described by Halford and Sanders. Each utterance elicited at the 20-s pause was the coding unit. Each utterance was classified into one of six categories: self-referent positive, self-referent negative, family-referent positive, family-referent negative, other-referent positive, and other-referent negative.

Briefly, behavioral definitions were as follows: (a) Parent- or family-referent response: This category was scored in any interval in which the speaker made a verbal reference to or comment on either the parent or family relationships. This included references to activities or events involving the mother or family and aspects of the parent's or family style, behavior, character, or manner. Examples are “Mum always says that,” “It's not fair that Kevin gets away with it,” and “Dad hates me.” (b) Self-referent response: This category was scored for any act, thought, or feeling about the self in which the parent- or family-referent category was absent and the subject referred to him- or herself, signified by the use of a personal pronoun (I or me). Examples are “I'm always in the wrong,” “Why me,” and “I can't do anything right.” (c) Other-referent response: This category was scored for any interval during which the preceding two categories were absent, the speaker's response was inaudible or absent, or the speaker declared he or she had nothing to say.

The cognitions just described were further divided into negative and positive categories. A response was scored as negative if any of the following occurred: (a) A speaker's tone of voice accompanying the utterance was considered negative. The observer made this judgment by attending to paralinguistic cues such as intonation, pitch, and inflection. (b) The speaker's response included reference to a negative affective state (e.g., being mad, upset, or angry). (c) The speaker's response was considered to be a criticism (e.g., devaluation or condemnation of characteristics, specific behavior, viewpoint, activities, or events) or a disagreement (an opposing proposition or an entire statement that was of a disagreeing nature) or involved an attribution of blame to the other person (e.g., “She's just saying that to get me mad”). A response was scored positive if there was an absence of negativity as just defined.

Given that the presence or absence of negative self-statements is generally viewed as a critical aspect of cognition influencing clinical problems (e.g., Kendall & Hollon, 1981), the dichotomy of negative versus neutral or positive was deemed appropriate. The measure derived from the system was the percentage of elicited cognitions that fell into each category. Two raters unaware of the families' diagnostic statuses and the experimental hypotheses were trained to use the coding system. One rater rated all the tapes; a second rated a randomly
selected one third of the tapes. The interrater reliabilities of the coding of cognitions were high, with kappa of 0.82 across all categories.

Affect Measures

Immediately after completing the problem-solving discussion, the child and mother each completed a rating form that assessed his or her overall subjective perceptions of the other's behavior during the interaction. Affective behavior was rated on a 7-point Likert scale for the following dimensions: sad–not sad, angry–not angry, critical–not critical, and happy–not happy.

Procedure

All children attended assessment sessions in the Behaviour Research and Therapy Centre, an outpatient research and training clinic at the University of Queensland. In the first session, we explained the study to the mothers and children and obtained signed informed-consent forms from them. We then conducted an intake interview and asked subjects to complete various self-report questionnaires. In Session 2, the problem-solving discussions, affect ratings, and cognitive assessment were completed. Immediately before commencing the problem-solving discussion, subjects were instructed to discuss the preselected topics for 10 min. The experimenter then left the room, turned on the video equipment, and signaled to the pair to commence the discussion. After the discussion, the mother and child each completed the affect rating form and then completed the videomediated recall procedure. After all assessments were completed, families received therapeutic services from either the Behaviour Research and Therapy Centre or the Child and Family Therapy Unit in the Royal Children's Hospital.

Results

Preliminary Analyses

Group differences on self-report measures were tested using a series of 2 (depressed vs. nondepressed) × 2 (conduct disordered vs. not conduct disordered) MANOVA tests (SPSS-X; Norusis, 1988) The means and standard deviations of the dependent variables are shown in Table 2.
In the first analysis, we examined the extent to which groups differed on the BID—M (the parent report measure) and the CDI (the child report measure). The MANOVA showed there was a significant interaction between depression and conduct disorder, $F(2, 63) = 5.27, p = .008$. Follow-up univariate analyses showed that the interaction was significant for both the BID—M and the CDI. Tukey honestly significant difference (HSD) tests comparing individual means showed that both of the depressed groups (depressed and mixed) scored more highly than did conduct-disordered and comparison groups on the BID—M. All three clinical groups scored higher than did comparison children on the CDI but did not differ from each other. There was also a significant main effect for both depression, $F(2, 63) = 33.5, p < .001$, and conduct disorder, $F(2, 63) = 8.92, p < .001$. Univariate ANOVAs showed that the main effects for depression were significant for both the BID—M, $F(1, 64) = 65.3, p < .001$, and the CDI, $F(1, 64) = 8.27, p = .005$. Similarly, the main effect for conduct disorder was significant for both the BID—M $F(1, 64) = 15.03, p < .001$, and the CDI, $F(91, 640) = 5.38, p = .005$. These main effects were not interpreted, given the significant interaction between depression and conduct disorder.

Another $2 \times 2$ analysis was conduct separately for mother's and father's personal adjustment using the BDI and the Dyadic Adjustment Scale. There were no significant differences between groups for fathers on any measures. However, for mothers there was a significant interaction between depression and conduct disorder, $F(2, 46) = 3.07, p = .05$. Follow-up univariate analyses showed that the interaction was significant only for mothers' marital adjustment, $F(1, 47) = 4.99, p = .03$. Tukey HSD tests showed that mothers of conduct-disordered children had lower levels of marital satisfaction than did mothers of the other three groups; however, their mean scores were in the nondistressed range.

On the Revised Behavior Problem Checklist, there was a significant interaction between depression and conduct disorder, $F(6, 64) = 5.28, p < .001$. Univariate analyses showed that the interaction was significant for four of the six subscales: CD, $F(1, 69) = 13.69, p < .001$; SA, $F(1, 69) = 4.96, p = .03$; AW, $F(1, 69) = 19.08, p = .004$; and ME, $F(1, 69) = 6.58, p = .01$. Tukey HSD tests showed that all three clinical groups had higher scores than did the
comparison group on the CD, PB, and ME subscales, but did not differ among themselves. The conduct-disordered group scored higher on the SA subscale than did the comparison group, but did not differ significantly from the other two clinic groups. On the AW subscale, the mixed group scored higher than the other three groups. The depressed and conduct-disordered groups scored higher than the comparison group but did not differ significantly from each other. There were also significant main effects for conduct disorder, $F(6, 64) = 8.96, p < .001$, and depression, $F(6, 64) = 7.55, p < .001$. Follow-up univariate analyses showed that the main effect for depression was significant for the CD, AP, AW, PB, and ME subscales, whereas the main effects for conduct disorder were significant for all subscales. Again, these main effects were not interpreted given the significant interaction between depression and conduct disorder.

Finally, on the Issues Checklist there was a significant interaction effect, $F(2, 620) = 3.34, p = .04$, which subsequent univariate analyses showed to be significant for parents only, $F(1, 63) = 6.12, p = .02$. Follow-up Tukey HSD tests showed that conduct-disordered and mixed groups scored higher than the comparison group but did not differ from each other. There was also a significant main effect for conduct disorder, $F(2, 62) = 7.62, p = .001$. Univariate analyses showed that this effect was significant for both mother, $F(1, 63) = 12.69, p = .001$, and child, $F(1, 630) = 4.86, p = .03$, ratings. There was no significant main effect for depression.

Analysis of Family Problem Solving

Table 3 presents the means and standard deviations for subjects on the observation measures. To identify the extent to which verbal problem-solving behaviors differentiated between groups, we conducted a $2 \times 2$ MANOVA on observed levels of positive problem solving and aversive content in children and mothers. There was a significant main effect for conduct disorder, $F(4, 64) = 3.35, p = .01$, but not for depression or the interaction of depression and conduct disorder. Subsequent univariate ANOVAs showed that conduct-disordered children (conduct-disordered and mixed groups) engaged in significantly lower levels of positive solution, $F(1, 67) = 5.71, p = .02$, and higher levels of aversive content, $F(1, 67) = 6.54, p = .01$, than did non-conduct-disordered children (depressed and comparison children). An identical pattern was observed for mothers, with mothers of conduct-disordered children displaying lower levels of positive solution, $F(1, 67) = 4.2, p = .04$, and more aversive content, $F(1, 67) = 6.66, p = .01$, than mothers of non-conduct-disordered children. Another $2 \times 2$ MANOVA was conducted on observed levels of depressed and angry affect to examine children's nonverbal affective behavior. There was a significant main effect for both depression, $F(2, 66) = 2.95, p = .05$, and conduct disorder, $F(2, 66) = 3.94, p = .02$. Follow-up univariate analyses revealed that the main effects for both depression, $F(1, 67) = 4.37, p = .04$, and conduct disorder, $F(1, 67) = 3.94, p = .02$, were significant for depressed affect only. The interaction of depression and conduct disorder also approached significance, $F(2, 66) = 2.82, p = .06$. Subsequent Tukey HSD tests showed that mixed and conduct-disordered children displayed more depressed affect than did comparison children and that conduct-disordered children showed more angry affect than did comparison children. Table 3 shows that all three clinic groups had substantially higher levels of depressed affect than did nonclinic children. The presence of both depression and conduct disorder (mixed children) was associated with the highest levels of depressed affect.
A similar analysis was conducted on observed levels of depressed and angry affect in mothers. Although the overall MANOVA showed there were no significant differences between parents on these variables, Table 3 indicates that the rate of angry affect in mothers of conduct-disordered children was almost five times the rate of angry affect in the other mothers.

Perceptions of Emotional State

Table 3 also presents data on children's and mothers' perceptions of each others' affective behavior during problem solving. A 2 (depressed vs. nondepressed) × 2 (conduct disordered vs. not conduct disordered) multivariate analysis of covariance (MANCOVA) was conducted on mothers' ratings of children's emotional state using children's independently observed levels of depressed and angry affect from the observation measure as covariates. After the effects of the covariates were partialed out, there was a significant interaction between depression and conduct disorder, F(4, 59) = 2.66, p = .04, but no significant main effects for depression or conduct disorder. Follow-up analyses of the interaction using Tukey HSD tests showed there were significant group differences in levels of sad, angry, and happy affect but not critical affect. Specifically, mothers of both groups of depressed children (depressed and mixed children) rated their children as showing significantly more sad affect than did mothers of comparison children. Mothers of depressed and conduct-disordered children perceived their children as showing more angry affect than did mothers of comparison children, and mothers of conduct-disordered children perceived their children as showing less happy affect than did mothers of comparison children.

Another 2 × 2 MANCOVA on children's ratings of mothers' affect, using independently observed levels of depressed and angry affect as covariates, showed there were no significant differences between groups.
Relationship Between Perceived and Observed Affective Behavior

Bivariate correlations were used to determine the degree of concordance between children's perceptions of their mother's affect and the independently observed level of angry and depressed affect displayed by the mother. Correlations were calculated separately for each group and appear in Table 4. The striking feature of these data is the relatively low level of concordance between children's and observers' ratings of parental affect, particularly for depressed children and conduct-disordered children. There were moderate correlations between nonclinic and mixed children's ratings of parental anger and observed anger ($r_s = .45$ and $.34$, respectively); however, the correlations for the depressed and conduct-disordered groups were low ($r_s = .08$ and $.03$, respectively). The mixed children's ratings of parental depression was also quite high ($r = .52$), whereas there was no parental depression in the comparison group.

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<th>Table 4</th>
<th>Bivariate Correlations Between Perceived and Observed Levels of Parents' Affect</th>
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<td>Children's perceptions of parents' affect</td>
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<td>Depressed children</td>
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<td>Conduct-disordered children</td>
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<td>Mixed-disorder children</td>
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<td>Comparison children</td>
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An identical analysis was conducted for mothers' ratings of their child's affect and independently observed levels of the child's angry and depressed affect (see Table 5). In general, mothers' ratings of their child's affect tended to be slightly higher than children's ratings of their mother's affect. For mothers of conduct-disordered children, there were moderate correlations between perceived and observed levels of anger ($r = .56$) and depression ($r = .62$), suggesting that they more accurately perceived their children as being either angry or sad when they were angry or sad. For mothers of mixed children, there was also a highly significant correlation between perceived and observed levels of depressed affect ($r = .89$) and a modest correlation for anger ($r = .21$). The correlations were slightly lower for mothers of depressed children for both anger and depression.

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<th>Table 5</th>
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Cognitive Measures

Table 6 shows the results of the content analysis of children's and mothers' self-statements during problem solving using videomediated recall. A 2 (depressed vs. nondepressed) × 2 (conduct disordered vs. not conduct disordered) MANOVA showed there was a significant interaction between depression and conduct disorder on measures of children's cognitive construction of their interactions with their mother, $F(6, 61) = 2.23$, $p = .05$, but no main effects for conduct disorder or depression. Follow-up univariate analyses showed that the interaction was significant for self-referent negative cognitions, $F(1, 66) = 4.4$, $p = .04$; family-referent positive cognitions, $F(1, 66) = 4.13$, $p = .04$; and other-referent negative
cognitions, $F(1, 66) = 3.9$, $p = .05$. Subsequent Tukey HSD tests showed that depressed children had significantly higher levels of other-referent negative cognitions than did all other groups. The conduct-disordered and comparison children did not differ from each other but were higher than the mixed children on other-referent negative cognitions. Depressed and conduct-disordered children both had lower levels of family-referent positive cognitions and higher levels of self-referent negative cognitions than did mixed and comparison children.

An identical analysis on mothers' cognitive data also showed an interaction effect that approached significance, $F(6, 61) = 2.13$, $p = .06$, and a main effect for conduct disorder, $F(6, 61) = 3.35$, $p = .006$, but not for depression. Follow-up univariate analyses showed that the main effect for conduct disorder was significant for family-referent positive cognitions only, $F(1, 66) = 10.5$, $p = .002$. Both groups of mothers of conduct-disordered children had lower levels of positive family-referent cognitions than did mothers of non-conduct-disordered children. Follow-up univariate analyses of the interaction showed the interaction was significant only for family-referent negative cognitions, $F(1, 66) = 8.87$, $p = .004$. Subsequent Tukey HSD tests showed that the mothers of depressed children and of conduct-disordered children had higher levels of family-referent negative cognitions than did mothers of comparison children.

Discussion

We sought to describe the family interactions of depressed and conduct-disordered children during family discussions of a conflictual nature and to concurrently identify the participating family member's (mother's) accompanying cognitive constructions of the interactions. The main findings highlight the centrality of deficits in interpersonal problem solving in depression and conduct disorder and a substantial degree of overlap in the interactional style of these children, particularly in the display of dysphoric affect. Children with conduct disorders, regardless of whether they concurrently met the diagnostic criteria for depression, showed lower levels of effective verbal problem solving and higher levels of aversive verbal content during problem-solving discussions than did non-conduct-disordered children. As predicted, conduct-disordered children displayed elevated levels of angry affect; however, contrary to our predictions, they also showed elevated levels of depressive affect during
family discussions. Overall, these findings confirm other research showing the poor interpersonal problem-solving skills of conduct-disordered children (Patterson, 1982).

In contrast, both groups of depressed children (as predicted) tended to display distressed nonverbal affect during problem solving rather than openly hostile or combative behavior. Their affect was primarily dysphoric as assessed by observers and as judged by mothers, with an absence of significantly elevated angry or hostile affect. Our data suggest that although problem-solving deficits are a shared characteristic of clinically disturbed children rather than specific to a particular disorder, children with different disorders exhibit somewhat different behaviors during problem-solving interactions.

The present results provide further evidence that conduct-disordered children reciprocate the levels of aversive verbal behavior and angry affect displayed by their parents. There was no such trend in any group for the display of depressed affect, which was generally very low for all mothers.

Contrary to our predictions, children with mixed depression-conduct disorder were characterized by depressive rather than by both angry and depressed affect, suggesting that the two disorders might be associated with a restricted range of emotional expression, particularly the overt display of anger. This phenomenon might lead to an interactional process described by Biglan, Lewis, and Hops (1990) whereby sullen depressive behavior enables the child to intermittently avoid or escape from open conflict. Depressed children may learn to use distress behaviors that signal to their parents to either decrease criticism or, alternatively, give sympathy or care. The disadvantage of this process is that many family problems remain unresolved, and over time parents and children disengage from each other, leading to diminished parental influence and control over the child.

To our knowledge, this is the first study to directly assess depressed children's ongoing cognitive constructions of their interactions with their parents. The results overall suggest some similarities and differences in the cognitive constructions of interpersonal stimuli of depressed children and conduct-disordered children. There was no evidence to support our hypothesis that depressed children would be more likely to cognitively distort their parents' affect and to have more negative self-referent cognitions than would conduct-disordered children. The cognitive variable that differentiated between depressed and conduct-disordered children was a higher level of other-referent negative cognitions in depressed children. However, depressed children engaged in similar levels of self-referent negative and family-referent positive cognitions as conduct-disordered children. Hence, depressed children displayed both externally focused and internally focused negative cognitions, whereas conduct-disordered children displayed only elevated internally focused negative cognitions.

It is interesting that children with mixed disorders reported very low levels of self- and other-referent negative cognitions. This finding is curious given that these children displayed the highest level of depressed affect during problem solving. It is possible that angry affect arousal may be necessary to activate depressogenic thinking in these children with mixed disorders. Alternatively, these children may have been so immobilized by depression that they were unable to accurately report their self-statements through the procedures we employed. These findings require replication before any definitive conclusions can be drawn.

There was also some evidence that mothers of depressed children engaged in more negative thinking about their family than did mothers of mixed or comparison children, whereas
mothers of conduct-disordered children also had lower levels of family-referent positive cognitions than did mothers of nonconduct-disordered children.

Correlational analyses suggested that depressed and conduct-disordered children's perceptions of their mother's affect had little relationship to the mother's independently observed affective behavior. In contrast, there was a higher level of concordance between mothers' perceptions of their child's affect and independent observation of the child's affective behavior. Mothers of depressed children tended to perceive their child's affect as sad and angry, whereas mothers of conduct-disordered children focused primarily on their child's anger.

Despite overall concordance between mothers' perceptions of their child's affect, there were significant group differences that remained after the independently observed levels of depressed and angry affect displayed by the child were partialed out. Thus differences between mothers' ratings of their child's affect were more discrepant across diagnostic groups than were the differences on independent observations. The extent of these discrepancies was predictable given the diagnostic group of the parent. The mothers of both groups of depressed children saw more depressed affect in their children, and mothers of the depressed and conduct-disordered children saw more anger in their children, than did the other mothers.

An important issue is the degree of discreteness or overlap between the children with different disorders on self-report measures. Although depressed children scored more highly than conduct-disordered children on the BID—M (a parent-completed measure), confirming the diagnostic classification of the sample, the two groups did not differ from each other on the CDI or on the CD, PB, or ME subscales of the Child Problem Behavior Checklist, although children with mixed disorders scored more highly on the AW subscale than did the other two clinical groups. This lack of differentiation between clinical groups on these measures may reflect limitations of children's self-report inventories and the at-best modest level of concordance with clinical diagnosis. On the key observational measures of interactive behavior during problem solving, which were the central focus of the study, differences in the affective expression of children in different clinical groups emerged.

These findings raise several important issues regarding the assessment and treatment of children with depression. First, all three clinical groups had limited repertoires for resolving family conflicts via problem solving. It remains an empirical question whether problem-solving and communication skills training can ameliorate depression. Second, several refinements in the way videomediated recall was used in the present study are indicated. During the recall procedure children and mothers separately were shown an image of their interaction. This video image more closely approximates what an observer might see rather than what the subject actually experiences. Following the suggestions of Schwartz and Garamoni (1986), in future research it may be better to position the camera to more accurately represent subjects' actual experience during the interaction, thus providing cues that facilitate the recall of cognitions during the interaction. This would necessitate having two cameras, each positioned over one subject's shoulder and focused on the other.

This study provides some support for treatment approaches for depression that involve problem-solving and communication skills training. Whereas such procedures have been shown to be useful with conduct-disordered children, the effectiveness of such procedures with depression is unknown. Treatment outcome research can contribute to our understanding of the causal role of family interaction patterns in depression. If specific patterns of family
interactions are experimentally manipulated and reliably produce reductions in depression, evidence for the causal significance of family variables is strengthened.

Future research needs to examine whether patterns of family interaction are related to the course of depression and, more specifically, whether changing patterns of family interaction are associated with changes in depressive symptomatology. Another important issue for future research is the extent to which family interaction patterns are related to gender and age differences. Because of the relatively small number of children in some groups, we did not examine our data for differences in gender or age. Finally, further research is needed that assesses family interaction patterns associated with childhood depression and conduct disorder in naturalistic settings. In the article by Dadds, Sanders, Morrison, & Rebegetz (1992) in this issue, the assessment of family interactions during the evening meal is described.

REFERENCES
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