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Family Process and Child Anxiety and Aggression: An Observational Analysis

Mark R. Dadds,[1,4] Paula M. Barrett,[1] Ronald M. Rapee,[2] and Sharon Ryan[3]

Barrett, Rapee, Dadds, and Ryan (1996) described a phenomenon whereby family discussions magnified the style of children's problem solving in a way characteristic of their particular clinical diagnosis. That is, anxious children became more avoidant, aggressive children more aggressive, and nonclinic children more prosocial, after discussing ambiguous hypothetical situations with their parents. This study examined specific sequences of communications exchanged between parents and children hypothesized to underlie this family exacerbation of child cognitive style. Family discussions were videotaped and categorized for groups of anxious, aggressive, and nonclinic children and their parents. Results revealed differences between groups of parents in frequency of agreeing with and listening to their child and the frequency of pointing out positive consequences. Conditional probability analyses showed that parents of anxious children were more likely to reciprocate avoidance, while parents of nonclinic children were more likely to agree with and listen to prosocial plans from their child. Differences in parent behaviors observed during the family discussions were reliably associated with the child's response to the ambiguous situation proposed after the family discussion. Results support a model of developmental anxiety and aggression that emphasizes the interaction of family processes and social-cognitive development in the child.

In 1992, our clinical research team recorded the following conversation between a 10-year-old boy, referred because of anxiety problems, and his parents. They had been asked to discuss how he should respond to a hy-

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[1]Griffith University, Brisbane, Australia.
[2]Macquarie University, New South Wales, Australia.
[3]Catholic Education of Queensland, Australia.
[4]Address all correspondence to Mark R. Dadds, School of Applied Psychology, Griffith University, Brisbane, Australia, 4111.

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pothetical scenario in which he noticed a group of children were laughing as he approached them to join in with their handball game.[5]

Boy: I'd just ask them; just go up and say "can I please join in?"
Mother: Do you reckon maybe they'd let you?
Boy: Maybe.
Mother: What sort of games do they usually play?
Boy: Tiggy or handball.
Father: Do you think they would let you if it was handball?
Boy: No.
Father: Why?
Boy: I'm not that good at it.
Father: You any good at tiggy?
Boy: No.
Mother: Why is this?
Boy: Because I can't run fast enough.
Mother: So do you think they would let you play or you don't think they would let you play?
Boy: No.
Mother: Would you be brave enough to go and ask them in the first place?
Boy: I wouldn't bother.
Mother: No.
Father: Why wouldn't you bother?
Boy: Because I know what the answer would be. Its always "no."
Mother: You don't think they would be laughing at you before you even turned up, thinking "he's going to ask."
Boy: Oh. Yes.
Mother: They might do that?
Boy: Yes.
Mother: So what do you think you would do?; just avoid these situations or would you really like to play?
Boy: Handball I'd like to play.
Mother: But you've just got to learn more ball skills.
Boy: Yes.
Mother: Its hard isn't it?
Boy: Yes.
Mother: (Comforts boy)

This conversation is typical of the sort of interactions we have observed in the families of anxious children during the task described by Barrett, Rapee, Dadds, and Ryan (1996). The parents appear to influence the child to be more cautious and to avoid taking a social risk, by modeling caution, providing information about risk, expressing doubt about the child's competency, and rewarding the child for avoidance by expressing agreement and nurturance when the child decides he would not join in with the other boys. Repeatedly witnessing scenarios like the above have alerted us to the potential importance of the family in the development, course, and treatment of child anxiety disorders. However, most contemporary theories of anxiety focus on the interplay of conditioning, social learning, cognitive,

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and biological processes, and little attention has been directed toward understanding the role of family context in these processes with anxious children. Popular texts on children's fears and phobias usually make no mention of the family in sections on the aetiology of child anxiety problems (e.g., Morris & Kratchowill, 1983).

For a number of other childhood disorders, family interaction has been identified as playing a major role in development and treatment (e.g., Kazdin, 1987). However, the importance of the family may vary according to the nature of the child's problems and for some childhood problems, the role of the family may be minimal (Sines, 1987). An examination of the literature on childhood anxiety reveals some indirect support for the family as an important contextual variable. Several controlled case studies have confirmed the efficacy of a combined individual and family approach (Dadds, Heard, & Rapee, 1991; King, Hamilton, & Ollendick, 1988) and a recent controlled trial showed that intervening at a broad family level produced superior treatment effects to an individual approach with a mixed sample of anxiety disorder children (Barrett, Dadds, Rapee, & Ryan, 1996).

Goodyer (1990) found that anxiety and depression in children are related to high levels of emotional distress, and lack of intimate social support, in mothers. Further, anxiety experienced by nonclinic children is positively correlated with marital problems in parents (Dadds & Powell, 1991). For anxious children, there is some support for the idea that parents are overly restrictive and dominating in their child-rearing behaviors, thus limiting the development of autonomy, courage, and positive self-efficacy in their children (Krohne & Hock, 1991; Solyom, Silberfield, & Solyom, 1976). Thus, a model of anxiety that integrates intrapersonal characteristics of the disorder such as cognitive style (Rapee, 1991) with contextual factors such as family interaction patterns may be the most consistent with emerging findings from recent research.

Within such an integrative model of childhood anxiety, Barrett, Rapee, et al. (1996) examined how anxious children interpret ambiguous social situations and formulate plans about how they would respond to those situations. A large sample of anxious (overanxious, separation anxious, socially phobic) children were compared with nonclinic and clinic-referred conduct problem children. Both the anxious and the conduct problem children interpreted the ambiguous situations as more threatening than the nonclinic children. When asked how they would respond to the situations, however, the nonclinic children predominantly chose prosocial solutions, the conduct problem children chose significantly more aggressive solutions, and the anxious children chose significantly more avoidant solutions.

To examine the role of the family in this process, Barrett, Rapee, et al. (1996) brought together the child and parents to discuss the child's interpretations and the child's proposed responses to two of the ambiguous situations. The results were clear. After discussing the solutions with their families, the nonclinic children stayed with their prosocial solutions, the conduct problem children chose even more aggressive solutions, and the anxious children chose even more avoidant solutions than they had prior to the family discussion.

There are several possible interpretations of these findings. It could be that parents are more accurate than the child in their evaluations and reports of how their child would respond to such situations; the family discussions serve the parents in influencing the child to be more honest. However, the amount of child avoidance (and aggression) after the family discussions was greater than even the parents had predicted. It appears that some process is occurring in the family discussions that is beyond the parents simply influencing the child to be more honest. Rather, the family discussions appear to influence the child to clearer manifestation of their particular vulnerability, that is, for anxious children to choose avoidance and aggressive children to choose aggression. This effect will be subsequently referred to as family enhancement of avoidant and aggressive responses (FEAR effect).

The study by Barrett, Rapee, et al. (1996) provides an experimental methodology to empirically test a model of child psychopathology in general, and anxiety in particular, that emphasizes the interplay of family processes and information-processing style in the child. Clearly, the next step is to examine the processes occurring within family discussions that are associated with the FEAR effect. The aim of this study was to examine the family processes that were occurring in the Barrett, Rapee, et al. (1996) study discussions that influenced the child to move toward more avoidant or aggressive solutions. Thus, in this paper we report on the actual moment to moment communicative behaviors that occurred between parents and children in these family discussions.

To formulate our hypotheses, we drew upon a social learning model as applied to family processes. That is, anxiety problems are manifest as a set of events (e.g., fear experience and expression, avoidance, caution) that are driven by and, in turn, drive the context in which they occur. Family discussions about potential threat and how to deal with it can be seen as a natural and recurring event in which the child's anxiety can be ameliorated or exacerbated by the family processes. For nonanxious children, family discussions about threat will be characterized by the child being encouraged to independently problem solve, and courage would be rewarded. For anxious children, discussions would foster dependence rather

than independence, the importance of anxiety would be exaggerated, and an increasingly stable style of information processing about threat and avoidance could be expected to emerge out of this interplay of child behavior and family context.

Thus, the model hypothesizes the presence of at least two learning processes: (a) In line with the model of Krohne and Hock (1991), parents of anxious children afford their children less independence in general, and would be less likely than the other parents to listen to and agree with their child's opinions. Thus, anxious children would be less able than other children to formulate independent, prosocial solutions to the hypothetical scenarios. (b) Parents of anxious children would be more likely to model and reinforce threat interpretations and avoidant solutions in the child, parents of conduct problem children would be more likely to model and reinforce threat interpretations but aggressive solutions in the child, and nonclinic parents would be more likely to model and reinforce nonthreat interpretations and prosocial interpretations in the child.

Two aspects of this model warrant further comment. The use of the family as the independent, and the child as the dependent, variable, as well as use of terms such as "influence" and "exacerbation," carry the implication that parents drive the child's anxiety problems. This is not our intention. Rather, it should be acknowledged that even if our hypotheses are supported, they do little more than show that certain parental behaviors are associated with anxiety problems in children, rather than cause them, and care must be taken to embrace a circular model of interdependence between the child's and the parents' behavior.

Finally, we needed to test whether the processes observed to occur in the family discussions were predictive of the child's final response to the ambiguous threat scenario. We thus hypothesized that the presence of avoidance (or aggression) in the final solution the child gave to the ambiguous situations would be positively correlated with the presence of corresponding parental behaviors in the family discussions.

METHOD

Participants

Participants in this study were a randomly selected subset of the sample described by Barrett, Rapee, et al. (1996) for whom videotaped records of the family discussions had been collected. The anxious group (ANX) consisted of 66 children, ages 7 to 14, with primary diagnoses of an anxiety disorder (24 overanxious disorder, 21 separation anxiety, 6 simple phobia,

and 15 social phobia) according to DSM-III-R criteria (American Psychiatric Association, 1987).

Diagnoses were made by clinical psychologists and psychiatrists using the Anxiety Disorder Interview Schedule for Children (ADIS-C: Silverman & Nelles, 1988). Reliability checks were conducted on every diagnostic ADIS-C interview by having two clinicians conducting each diagnostic interview separately with parents and children. The overall kappa agreement for the presence of any anxiety disorder was .70, and kappas for specific anxiety disorder diagnoses ranged from .63 to .82. Details of the diagnostic reliability procedures and results can be found in Rapee, Barrett, Dadds, and Evans (1994). Children with additional diagnoses other than one of the DSM-III-R anxiety disorders were excluded from this group.

The comparison groups consisted of a nonclinic group (NON-C: n = 18) of children and their parents recruited from schools in the same geographical area from which the clinic groups were drawn, and a sample of clinic-referred aggressive children (oppositional defiant and conduct disorder) (AGGRESS: n = 16) who were recruited from the regular clinical referrals to the Behaviour Research and Therapy Centre at the University of Queensland. NON-C and AGGRESS children were screened using the ADIS-C to ensure the nonclinic children had no identifiable disorder and that the AGGRESS children had either oppositional or conduct disorder only. Significant differences between groups were found on number of siblings, $F(2, 85) = 5.62$, $p = .005$, in that anxious children had significantly fewer siblings than nonclinic children, and mother's socioeconomic status (SES) as measured on a 1 to 7 continuous scale (Daniel, 1983), $F(2, 84) = 3.73$, $p = .03$, in that the mothers of aggressive children had lower SES than mothers of nonclinic children. Neither of these measures were significantly correlated with any of the dependent measures used in this study and thus they are not considered further.

The sample was predominantly white, Anglo-Saxon, of Protestant and Catholic religions, and from working to middle-class SES. They were drawn from the metropolitan area of Brisbane, Australia, a seaside city of approximately 1 million people. Demographic data on the sample are shown in Table I.

Procedure

A description of the full experimental procedure can be found in Barrett, Rapee, et al. (1996). One ambiguous social threat situation and one ambiguous physical threat situation were selected to be discussed by the family as a whole. The two ambiguous situations used for the family discussions were:

Table I: Demographic Data for Nonclinic, Anxious and Aggressive Samples[a]

	Nonclinic (n = 18)	Anxious (n = 66)	Aggressive (n = 16)
Child's age			
M	10.47	9.57	9.87
SD	2.26	2.23	2.41
% Female	41.10	58.50	56.20
% Intact families	88.20	84.60	67.80
Mother's age			
M	37.76	38.00	38.73
SD	3.45	5.15	4.90
n	17	66	15
Father's age			
M	40.29	40.05	40.61
SD	4.15	5.58	6.67
n	10	50	10
No. of siblings			
M	2.41_a	1.64_a	2.00
SD	1.17	0.84	1.36
Mother's SES			
M	3.37_a	4.41	5.00_a
SD	1.92	1.76	1.60
Father's SES			
M	3.17	3.52	3.38
SD	1.91	1.95	1.94

[a]Means both having the subscript a are significantly different from each other using Tukey's HSD test at $p < .05$.

Physical situation: "On the way to school you (your child) feels funny in the tummy. What do you think is happening? What would you (your child) do?"

Social situation: "You see a group of students from another class playing a great game. As you (your child) walk(s) over and want to join in, you notice that they are laughing. What do you think is happening? What would you (your child) do?"

The child and her or his parents were asked to interpret and respond to these situations first alone during an interview with a research assistant naive of the child's diagnosis and the hypotheses of the study. Next, the family was brought together to discuss the two ambiguous situations for 5 minutes each. The family was told that at the end of each discussion, the

research assistant would return to the discussion room and the child would be asked how she or he would respond to the ambiguous situation. While the parents could help the child, the final solution was to be the child's decision. The child's solutions were recorded on videotape and then transcribed for comparison with those previously suggested by the child in response to the initial, individual protocol of the same ambiguous situations questions.

The type of solutions suggested were scored into mutually exclusive categories of prosocial, aggressive, or avoidant. *Aggressive solutions* were defined as those that cause or have the potential to cause damage, distress, embarrassment, or any other harm to any object or person ("I would make them play with me," "I would tell them what are bunch of jerks they are"). *Avoidant solutions* were defined as those in which the child removes him or herself from the situation ("I would go away by myself," "I wouldn't try to join in," "I wouldn't say anything"). *Prosocial solutions* were simply defined as any solution that was not aggressive or avoidant ("I would just try to join in the game," "I would ask them if I could play"). Raters were two psychologists naive to the diagnostic status of the children and 100% agreement occurred on the assignment of child responses to avoidant, aggressive, and prosocial categories.

Classification of Family Interaction

Family discussions of the two ambiguous situations were videotaped for later coding using the Family Anxiety Coding Schedule (FACS: Dadds, Ryan, & Barrett, 1993). Coders were four graduate psychology students who had received 2 weeks training in the use of the FACS, had reached criterion reliability prior to coding, and were unaware of the group membership of the children and their families. The coder stopped the videotape after each utterance by any family member, and then classified that utterance into one of the mutually exclusive categories specified by the FACS shown in Table II. Utterances by the same speaker that collectively included more than one content category were separated into different categories for the same speaker. Reliability checks were conducted on 33% of all discussions by having two observers score the discussion simultaneously. Observer 1 would stop the tape thereby defining the utterance to be classified. Observers would then independently classify the utterance on separate score sheets. Thus, our interrater reliability checks refer to accuracy of classification but not to agreement on utterance length which was considered irrelevant to the goals of the study.

The FACS prescribes that each utterance is coded on four dimensions: speaker, listener, content category, and affect category. Brief definitions of the content and affect classifications are shown in Table II.

The following dependent measures were derived from the FACS; The percentage of utterances where each person expressed *agreement* and *listening* were the process measures. The percentage of intervals where each person communicated *threat* descriptions, *prosocial responses*, *aggressive responses*, *avoidant responses*, *positive consequences*, and *negative consequences*, were the content measures.

For the purposes of comparing the conditional probabilities that particular types of parent behavior would follow particular types of child behavior, four omnibus measures were calculated. Expressions of threat, avoidance, or negative consequences were collapsed into one category called *Avoidance*. Expressions of nonthreat descriptions, prosocial responses, or positive consequences were called *prosocial*. Any instance of agree or listen was called *Yes*. The four measures were then: (a) Avoidance–avoidance: the probability that the parent(s) would reciprocate child avoidance; (b) Avoidance–yes: the probability that parent(s) would agree

Table II: Brief Category Definitions for the Family Anxiety Coding Schedule

	Content categories
Describe:	Comments that describe the problem at hand. Scored as non*threat* (e.g., "They are laughing because they are having fun, not at me") versus *threat* (e.g., "The other boys don't like me").
Solution:	Comments that suggest ways of dealing with the problem at hand. Scored *prosocial* (e.g., "I will ask them if I can join in"), or *aggressive* (e.g., "I will punch anyone who tries to stop me"), or *avoidant* (e.g., "I will just play on my own").
Consequence:	Comments that point out the consequences of a behavior. Scored *positive* (e.g., "They will let me play") versus *negative* (e.g., "If I ask them, they will just laugh at me").
	Process categories
Respond:	Behaviors that express *agree*ment versus *disagree*ment with the previous speaker.
Listen:	Active attending behavior (nodding, saying "mm hmm").
	Affect ratings

Each behavior by any family member is scored according to affect using Happy, Anxious, Sad, Angry, or Neutral categories. These are scored using any or all cues from facial expression, tone of voice, body posture, and self-report. Laughter is scored as anxiety unless it is an appropriate response to a funny comment or behavior.

with or actively listen to child avoidance; (c) Prosocial–prosocial: the probability that the parent(s) would reciprocate child prosocial, and (d) Prosocial–yes: the probability that the parent would agree with or actively listen to child prosocial.

RESULTS

Interrater Reliability

The numbers of utterances per discussion per family member were mothers: nonclinic = 31.2, anxious = 40.0, aggress = 36.2; fathers: nonclinic = 29.0, anxious = 28.1, aggress = 29.6; children: nonclinic = 28.4, anxious = 42.2, aggress = 40.9. Analyses of variance indicated no significant differences between the groups on the number of utterances. Interrater reliability on the FACS classifications was calculated in two ways corresponding to the main analyses. First, kappas were calculated for occurrence versus nonoccurrence of each category specified in the FACS, on an utterance by utterance basis across different groups and family discussions. The overall mean kappas and ranges across families were .99 (.92–1.00) for speaker, .94 (.88–.99) for listener, .78 (.61–.87) for content code, and .72 (.58–.79) for affect code. Four categories of the original FACS (self-referent positive and negative, other referent positive and negative) had interreliability mean kappas below .6 and these were not used in this paper. All other content and affect codes had mean kappas above .68.

Second, we followed the recommendation of Gottman (1980) and examined interrater reliability at the level of conditional probabilities. That is, conditional probabilities were calculated for Observer 1 and then the ANOVA comparisons across groups were performed. The conditional probabilities were then calculated for Observer 2 separately and the parallel ANOVA comparisons were made. Results presented in this paper reflect comparisons that were robust across both observers. That is, the conditional probabilities had to differ across groups in the same direction and be statistically significant for both observers to be reported here.

Confirmation of FEAR Effect

Before analyzing the family processes that occurred in the discussions, we wanted to check that the FEAR effect had occurred in our subsample. The percentage of children in each group who chose avoidant solutions, averaged across the social and physical situations, before and after the family discussions were NON-C: pre = 22.2, post = 5.5; ANX: pre = 35.7,

post = 74.0; AGGRESS: pre = 25.0, post = 12.5. The percentage of children in each group who chose aggressive solutions, averaged across the social and physical situations, before and after the family discussions were NON-C: pre = 5.5, post = 0.0; ANX: pre = 5.8, post = 6.0; AGGRESS: pre = 21.9, post = 78.1. Thus, the results on this sample are substantially the same as for Barrett, Rapee, et al.'s (1996) report on the larger sample: anxious children move to more avoidance, aggressive children to more aggression, and nonclinic children to more prosocial responses, following the family discussions.

Data Analyses

The data on family process within the discussions were analyzed in three ways. First, we were interested in whether families differed in the frequencies with which they communicated threat, avoidance, aggression, prosocial behavior, positive and negative consequences, and the frequencies with which they listened to and agreed with each other. Thus, a series of ANOVAS were performed using group membership (NON-C, ANX, AGGRESS) as an independent variable and the various categories of the FACS as dependent variables. Eight ANOVAs were thus performed. Probability levels for each ANOVA are presented to two decimal points where they are lower than $p < .05$. Using a Bonferonni adjustment, the rejection level would be approximately $p < .007$.

Second, we were interested in the interdependencies of the four omnibus measures of family member behavior derived from the FACS. Thus, we calculated conditional probabilities of sequences of behavior and then compared these probabilities across groups, again using group as the independent variable, in four ANOVAS (Bonferonni adjustment $p < .012$). Finally, to examine whether the process that occurred in the family discussion was related to the solution that the child gave at the end of the discussion, we examined correlations between conditional probabilities and the child's final solution.

Frequencies of Family Behaviors Across Groups

Table III shows means and standard deviations of the relevant FACS codes across groups. Heterogeneity of variance is evident across the groups and in combination with the different sample sizes, the assumptions underlying the appropriate use of ANOVA may be violated. To check this, frequencies were analyzed in SPSSX using the Kruskal-Wallis rank-sum test, a nonparametric alternative to ANOVA which tests differences be-

Table III: Means on the Categories of Child, Mother, and Father Behavior Produced by the Family Anxiety Coding Schedule, for Nonclinic, Anxious and Aggressive Groups[a]

	Mother			Father			Child		
Behavior	NON-C	ANX	AGG	NON-C	ANX	AGG	NON-C	ANX	AGG
Agree									
M	$6.0_{a,b}$	2.8_{a}	1.2_{b}	6.6	3.5	3.5	5.5	7.9	5.5
SD	9.3	3.6	2.3	6.2	4.5	7.4	3.9	6.9	4.0
Listen									
M	3.5	2.0	4.9	4.0	1.4	2.3	0.7	0.2	0.2
SD	6.3	3.1	6.8	6.2	2.5	4.2	2.1	0.8	0.7
Threat									
M	3.9	4.4	7.6	2.3	4.3	5.7	9.2	8.3	11.1
SD	3.7	5.1	7.1	2.1	4.8	5.2	6.3	9.5	10.0
Prosocial									
M	6.1	4.7	3.6	4.2	5.3	2.0	20.6_{a}	12.5_{a}	15.7
SD	6.7	4.7	3.8	4.8	6.4	3.3	13.8	8.0	10.5
Aggressive									
M	0.0	0.1	0.1	0.7_{a}	$0.0_{a,b}$	0.7_{b}	1.3	1.2	3.3
SD	0.0	0.3	0.4	2.2	0.3	1.4	5.1	2.4	4.9
Avoidant									
M	0.4	1.1	0.7	2.1	1.0	2.8	4.9_{a}	6.8	10.8_{a}
SD	1.0	1.8	1.6	6.3	2.0	4.1	7.9	5.9	6.3
+ Conseq									
M	$1.4_{a,b}$	0.2_{a}	0.2_{b}	0.5	0.9	0.5	1.7_{a}	0.8	0.1_{a}
SD	2.4	0.9	0.6	1.7	2.7	1.1	2.5	1.3	0.5
- Conseq									
M	0.5	0.4	0.3	0.5	0.9	0.8	0.7	1.1	1.3
SD	1.0	1.2	0.9	1.5	2.1	1.2	1.6	1.8	1.8

[a]Means with the same subscripts are significantly different from each other using Tukey's HSD test at $p < .05$.

tween groups after rank ordering the data, as well as standard one-way ANOVAS. Confirmation and rejection of hypotheses was identical using either test and thus the appropriateness of ANOVAs did not appear to be invalidated by the unequal variances and sample sizes. Thus, in what follows, we present the oneway ANOVA results tested on means and standard deviations for ease of interpretation.

The hypothesis that parents of anxious children would be less likely to listen to and agree with their child's solutions was partly supported. Mothers of nonclinic children were significantly more likely, at the $p < .05$ level only, to agree with their child than mothers of both anxious and aggressive children, $F(2, 95) = 4.14, p = .01$. Relatively higher levels of agreement were also found for the fathers of nonclinic children, although the differences were not statistically significant. Mothers of the anxious children were significantly less likely, again only at the $p < .05$ level, to listen to their children than mothers of aggressive children, $F(2, 95) = 3.72, p = .02$. Again, a similar pattern of means can be seen for fathers' listening, however the results were not significant at the $p < .05$ level.

The hypothesis that parents of anxious children would communicate more threat interpretations to their child than the nonclinic parents was not supported. Similarly, no differences in the frequency of threat were found between groups of children. In terms of response plans, we looked at differences in the frequency of prosocial, avoidant, and aggressive utterances across groups. No differences were found on any of these for mothers. Fathers of anxious children were less likely, at the $p < .05$ level, than fathers of both nonclinic and aggressive children to communicate aggressive solutions to the child, $F(2, 68) = 3.5, p = .03$. Nonclinic children were more likely than anxious children to communicate prosocial plans, $F(2, 99) = 5.14, p = .007$, and were less likely than aggressive children to communicate avoidant plans, at the $p < .05$ level, $F(2, 99) = 3.83, p = .02$.

In terms of the communication of likely consequences to plans, mothers of nonclinic children were more likely than mothers of anxious and aggressive children to point out positive consequences, $F(2, 95) = 5.42, p = .005$. No differences were found for fathers. At the $p < .05$ level, nonclinic children were more likely than aggressive children to communicate positive consequences, $F(2, 99) = 4.16, p = .01$.

Conditional Family Interactions Across Groups

Before conditional probabilities were calculated, categories of the FACS were examined for autocorrelation. This occurs when a person's behavior at Time 1 is reliably predictive of their behavior at Time 2. It can

be a problem because two autocorrelated variables can appear to be related as an artifact of their own autocorrelations (Dumas, 1986; Suen & Ary, 1987). Lag 1 autocorrelations, corresponding to the lag used in all calculations below, did not exceed .2 for any category of the FACS for any person and so the *z* values presented below were not adjusted for autocorrelation.

Conditional probabilities and *z* values were calculated as described in Allison and Liker (1982) and Dumas (1986). To maximize power, mothers and fathers were combined into one and thus data apply to a generic "parent." That is, after each child utterance, the program searched for the next parent response and used this in the probability analysis regardless of whether it was the mother or the father. The *z* values were then used as raw data for ANOVA comparison using group as the independent variable and the relevant *z* value as the dependent variable.

Table IV shows the means and standard deviations for *z* values reflecting probabilities that parents would (a) respond to child avoidance with avoidance, Avoid–Avoid; (b) agree with or actively listen to child avoidance, Avoid–Yes; (c) respond to child prosocial with prosocial, Prosocial–Prosocial; and (d) agree with child prosocial, Prosocial–Yes. At the $p < .05$ level, parents of anxious children were more likely than parents of nonclinic children to reciprocate avoidance with avoidance, $F(2, 48) = 3.39$, $p = .04$. Significant at the Bonferonni adjusted level, parents of nonclinic children

Table IV. Means of Conditional Probabilities (*z* Values) of Parent Behavior Following Child Behavior, for NON-C, ANXIOUS, and AGGRESS Groups[a]

	NON-C	ANXIOUS	AGGRESS
Avoid–Avoid			
M	-0.23_a	0.19_a	0.00
SD	0.32	0.46	0.39
Avoid–Yes			
M	0.18	0.21	-0.14
SD	0.58	0.59	0.14
Prosocial–Prosocial			
M	0.47	0.35	0.25
SD	0.70	0.67	0.88
Prosocial–Yes			
M	$1.68_{a,b}$	0.64_a	0.37_b
SD	0.82	0.86	1.16

[a]Means with the same subscripts are significantly different from each other using Tukey's HSD test at $p < .05$.

were more likely than parents of anxious and aggressive children to agree with their child's prosocial plans, $F(2, 65) = 3.32$, $p = .008$.

An attempt to conduct parallel analyses for aggressive behavior failed. Only small numbers of families emitted the solution category scored aggressive and these were restricted to the aggressive group, thus the sample size fell below that appropriate to the use of the conditional probability analyses and group comparisons were impossible.

Relationship of Process to Outcome

Finally, it was hypothesized that the processes observed in the family discussions to differentiate between the groups would correlate with the likelihood that the child would give an avoidant solution at the end of the discussion. To test this, correlations were calculated between the child–parent conditional probabilities of avoidant–yes, prosocial–yes, avoidant–avoidant, and prosocial–prosocial, and the final avoidance score, using the entire sample. The final avoidance score was calculated by assigning a 1 for an avoidant solution, and a 0 for any other solution for each of the social and physical situation family discussions. Thus, the child's final avoidance score could range from 0 to 2.

The resulting correlations were: avoidant–yes ($r = .26$, $p < 0.05$), prosocial–yes ($r = -.25$, $p < 0.05$), avoidant–avoidant ($r = .23$, $p < 0.05$), and prosocial–prosocial ($r = -.17$). Generally the correlations are low as would be expected given the restricted variance of the final avoidance variable and the difference in the types of variables being correlated (a 3-choice categorical variable with a mathematically derived z value). Despite this, there is support for the hypothesis at hand. The more the parents rewarded avoidant child talk ($r = .26$) or reciprocated avoidant child talk ($r = .23$), the more likely the child was to choose a final avoidant solution. The more the parents rewarded prosocial solutions, the less likely the child was to choose an avoidant solution ($r = -.25$).

DISCUSSION

The aim of this study was to examine the relationship between family processes and child cognitive style associated with anxiety disorders, and to a lesser extent aggression, in children. More specifically, we conducted an exploration of family processes that we hypothesized could be in part responsible for the FEAR effect observed by Barrett, Rapee, et al. (1996). To briefly recap, they observed that anxious children formulated more avoidant plans, and aggressive children more aggressive plans, after dis-

cussing their interpretations of various ambiguous situations and their plans for how to respond to them, with their parents. We hypothesized that the clinical groups (anxious, nonclinic, and aggressive) would differ in the frequencies with which parents modeled and reinforced threat interpretations, avoidant and aggressive plans, anticipated positive and negative consequences, and with which they listened to and agreed with their children. Further, we hypothesized that the presence of these parental behaviors during family discussions would correlate with the nature of the child's final response plans to the ambiguous situations, that is, whether they were avoidant, prosocial, or aggressive.

In terms of process behaviors, the hypothesis that parents of anxious children would listen to and agree with their children less than other parents was partly supported. Mothers of anxious children agreed less with their child than did mothers of nonclinic children, however, they did not differ from mothers of aggressive children. This lack of maternal agreement appears to be associated with the child having clinic status rather than being specific to a particular diagnosis. The same tendency was noted for fathers. However this result was not statistically significant, partly due to the smaller sample of fathers involved in the study, and the difference for mothers was significant at $p < .05$ but not at the adjusted level. Mothers of anxious children also listened less to their children than mothers of aggressive children, and the means for the fathers showed the same tendency, although again it was not statistically significant.

Taken together, these findings provide some support for Krohne and Hock's (1991) model of the development of childhood anxiety which specifies that parents of anxious children are less likely to grant and reward autonomy of thought and action. Thus, the child fails to develop appropriate self-efficacy, leading to a cycle of poor self-confidence and avoidance of challenges.

The next hypothesis examined the frequencies of threat perception, avoidant, prosocial, and aggressive plans, and anticipated consequences expressed in the family discussions. No differences between diagnostic groups were found in terms of the frequency with which any family member communicated threat interpretations. This was surprising given that Barrett, Rapee, et al. (1996) found that both the anxious and aggressive children and their parents made more threat interpretations of the ambiguous situations. It appears that an explanation of the FEAR effect that parents simply model more threat interpretations of the ambiguous situations is not tenable.

Similarly, differences between groups in terms of the frequency of communication of different response plans were not impressive. Fathers of anxious children were less likely than both fathers of nonclinic and aggressive children to propose aggressive response plans, however, this was the

only difference between groups of parents in their proposal of avoidant versus prosocial versus aggressive plans. More differences were seen for children. Anxious children were less likely than nonclinic children to propose prosocial plans, and aggressive children were more likely than nonclinic children to propose avoidant plans.

In terms of the communication of anticipated consequences, mothers of nonclinic children were more likely than mothers of both anxious and aggressive children to point out positive consequences and parallel findings emerged for the children themselves. No differences were found for the communication of negative consequences.

The above analyses focused on frequency of occurrence rather than the interplay of family members' behavior. Thus, our main analyses looked at conditional probabilities of parent behavior occurring given that the child had engaged in an avoidant versus a prosocial communication. The results were in the predicted direction. That is, parents of anxious children were more likely than parents of nonclinic children to respond to an avoidant communication from their child, with their own avoidant communication. In contrast, parents of nonclinic children were more likely than the other two groups to agree with and/or listen to a prosocial communication by their child.

Thus, it appears that important differences between diagnostic groups may relate to the way parents reciprocate their children's problem solving. Parents of anxious children appear to be more likely to reciprocate avoidant talk and we would expect this reciprocation to strengthen the selection of avoidant plans in the children's repertoire. Earlier we saw that parents of nonclinic children tended to agree with and listen to their children more. The conditional probability data indicate that these nonclinic parents are more likely to express this agreement in response to their child expressing a prosocial plan. Our clinical experience, as illustrated in the transcript presented early in this paper, reinforces this conclusion that parents of anxious children are less likely to agree with and listen to the child when he or she proposes a prosocial plan. Rather, these parents were observed to keep prompting and questioning the child until the child proposed a more avoidant plan.

Finally, we wanted to validate the above findings concerning the process of the family discussions by examining whether the parents' behavior in the discussions was reliably associated with the child's final plan proposed after the discussion. The correlations supported this association. The rate of avoidance in the child was positively correlated with the probability that parents agreed to and listened to avoidance and the probability that they reciprocated avoidance. The rate of child avoidance was negatively correlated with the probability that the parents would agree with, listen to,

and reciprocate the child's prosocial plans. Although these correlations were generally small, they provide a validity check of the conditional probability data in that any significant correlation was difficult to achieve given the different types of measures being correlated; one being a dichotomous variable and the other being a *z* statistic derived by sequences of complex mathematics.

Overall sufficient evidence emerges to conclude that differences exist in the way parents of anxious, aggressive, and nonclinic children interact with their children in problem-solving discussions focused on how to interpret and respond to ambiguous situations. On some measures, the two groups of clinic children were different from the nonclinic children and their families, but not different from each other. On a smaller number of measures, differences were found between the anxious and aggressive children and their families, or between the anxious and nonclinic groups only. These differences include the relative tendency of parents of anxious children to listen less to their child, to point out less positive consequences to their child, and to reciprocate avoidant plan proposals. Further, our results show that the final plans a child emerges with after a family discussion are reliably associated with those behaviors that differentiate the parents of anxious children from the nonclinic children.

A number of methodological issues and limitations of this study should be noted. First, our data were marked by unequal variance across the groups and this may have compromised our statistical power. Many of the observational measures derived from the FACS were negatively skewed with sizable proportions of subjects scoring zero. Attempts to transform data did not help. Further, attempts to divide the anxious group by sex, anxiety diagnosis, severity of diagnosis, and age of child did not appear to produce more homogenous subgroups in terms of the dependent measures utilized.

Consequently, we note that the above conclusions apply to a majority proportion of the sample, but there was a subset of the anxious children whose parents scored zero on many of the dependent measures, and our conclusions do not appear to apply to all anxious children. Further research is needed to examine the family discussion effect in more homogeneously defined groups of anxious children. Another solution to this problem might be to extend the length of the family discussions. The 10-minute discussion may not have been long enough to provide adequate base rates of all of the behaviors we were interested in. Unfortunately, we were unable to conduct the conditional probability analyses for aggressive solutions due to low base rates of this behavior across groups.

Second, the child's final response is of course a self-report measure and we cannot conclude how these family discussions and the child's final

plan would be related to actual child behavior. Further, the situations selected were hypothetical and further research might profit by utilizing ambiguous situations that are more relevant to each child and where the child's actual behavior is sampled. Third, our conclusions can easily lead to the mistaken impression that parental behavior causes or drives the child's anxiety. This really cannot be concluded from these data. Rather, it is likely that the parents are responding themselves to a sensitive child who has a history of fear and avoidance and much of their behavior is just as "driven" by the child. Clearly, a model of reciprocal determinism should be embraced in which each person's behavior is seen as interlinked, and the chances of blaming parents are minimized.

Fourth, our results illustrate the need to include multiple control groups in research into the development of psychopathology. Simply using nonclinic comparison groups is not comprehensive enough to sort out whether findings are specific to a disorder or are more generally related to clinic referral and presentation.

The experimental method used by Barrett, Rapee, et al. (1996) and in this study that revealed the FEAR effect appears to have potential for the study of childhood behavioral and emotional problems and family context in which they develop. Preliminary results from other clinics (Chorpita, Albano, & Barlow, 1993) are consistent with our data, showing that parents influence and are influenced by the cognitive styles that appear to characterize different forms of child psychopathology. Our results indicate that research into the microprocesses of family interaction has the potential to clarify the developmental course of these cognitive vulnerabilities.

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