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Family Enhancement of Cognitive Style in Anxious and Aggressive Children

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Previous research has shown that anxious adults provide more threat interpretations of ambiguous stimuli than other clinic and nonclinic persons. We were interested in investigating if the same bias occurs in anxious children and how family processes impact on these children's interpretations of ambiguity. Anxious, oppositional, and nonclinical children and their parents were asked separately to interpret and provide plans of action to ambiguous scenarios. Afterwards, Each family was asked to discuss two of these situations as a family and for the child to provide a final response. The results showed that anxious and oppositional children were both more likely to interpret ambiguous scenarios in a threatening manner. However, the two clinic groups differed in that the anxious children predominantly chose avoidant solutions whereas the oppositional children chose aggressive solutions. After family discussions, both the anxious children's avoidant plans of action and the oppositional children's aggressive plans increased. Thus, this study provides the first evidence of family enhancement of avoidant and aggressive responses in children. These results support a model of anxiety that emphasizes the development of an anxious cognitive style in the context of anxiety-supporting family processes..

Research into adult anxiety has shown that anxious adults frequently display cognitive biases in the processing of environmental stimuli (MacLeod, Mathews, & Tata, 1986). Compared with nonclinic subjects, they are more

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likely to interpret ambiguous material as threatening and tend to think that negative threatening events are more likely to happen to themselves than anyone else (Butler & Mathews, 1983). One question which has remained untested is whether cognitive biases in anxious adults are established in adulthood or were already present at a young age. Retrospective studies have indicated that anxious adults often report having experienced high anxiety as children, raising the question of whether some of these cognitive biases were already present in childhood (Mattison, 1992). In studies of aggressive children, for example, Dodge (1986) has found that such children display a bias toward excessive attributions of hostile intentions in others. However, to date, there has not been similar published research with other groups of children.

Some recent research has attempted to examine the way in which feared outcomes are represented in long-term memory (Campbell & Rapee, 1994; Lovibond & Rapee, 1993). These studies have indicated that children seem to represent threatening outcomes in a very similar way to adults. Specifically, feared outcomes seem to be organized along two major factors: physical threat (physical harm) and social threat (negative evaluation). Another interesting research question, then, is whether people with different symptomatologies (predominantly social or physical fears), and different anxiety diagnoses, manifest different interpretation and response biases to ambiguity related specifically to physical or social situations.

In addition to the important role which cognitive factors may play in the maintenance of child anxiety, a large body of research has indicated that child psychopathology generally needs to be understood in the context of family interactional patterns (Dadds, 1987; Patterson & Reid, 1984). While direct observational studies of family processes with anxious children are rare (cf. Dadds, Barrett, Rapee, & Ryan, in press), there exists indirect evidence to support the role of family processes in the development of childhood anxiety.

Epidemiological studies (Klein & Last, 1989) point to the familial transmission of anxiety disorders. Studies of parents of anxious children find that they tend to selectively focus on future negative outcomes for their children's current activities (Kortlander, Kendall, & Chansky, 1990). Krohne and Hock (1991) have suggested a "two-process model" that deals with the relationship between specific styles of parental child-rearing and coping dispositions in the children. Empirical tests of their model show that high anxiety in a child is significantly related to frequent negative feedback and parental restriction (Krohne & Hock, 1991). Hence, it is plausible that anxious children might learn to expect negative consequences for their behavior and as a result become fearful and avoidant. Recent clinical studies have further confirmed that the involvement of families in the treatment

of anxious children is more effective than just treating the child (Barrett, Dadds, Rapee, & Ryan, in press; Dadds, Heard, & Rapee, 1991; King, Hamilton, & Ollendick, 1988).

It is thus proposed that cognitive biases in anxious children may be related to family styles that emphasize threat perception and avoidance. Hence, it is important that further research encompasses not only the child's cognitions and behavior but also their parents' expectations and influence via family communication processes.

The aim of the present study was to assess interpretation bias associated with danger schemata in clinically anxious children. The procedures were based on modification of previous research with adults (Butler & Mathews, 1983) and included physical and social ambiguous situations to evaluate potential differences across anxiety diagnostic groups. We also wanted to assess children's strategies for dealing with possible threats. Thus we asked them to interpret ambiguous situations and come up with a response-solution for each one. We were also interested in the role of family processes, so we examined parental predictions of, and the effect of a family discussion on, the children's responses.

Further, and considering the high comorbidity found among anxiety disorders in children (Rapee et al., in press) and other limitations of using categorical systems in childhood research (e.g., oppositional and nonclinic children can also suffer from anxiety problems), we examined parallels between the use of a dimensional [using the Child Behavior Checklist (CBCL); Achenbach & Edelbrock, 1991] and a categorical approach (DSM-III-R; American Psychiatric Association, 1987) on the participants' interpretations and response plans. By using a dimensional approach we tried to investigate whether specific problem behaviors could be related to interpretation or response biases in children.

It was hypothesized that anxious children would make more threat interpretations and that they would provide more avoidant plans of action than other clinic-referred and nonclinic children. We also predicted that their parents would demonstrate a similar threat interpretation bias and prediction of avoidance plans.

METHOD

Participants

The anxious group consisted of 152 children aged 7 to 14, free from intellectual and severe physical disabilities, who were referred from other mental health professionals and by parents following media coverage of a

treatment program for anxious children. All children and parents were interviewed with the Anxiety Disorders Interview Schedule for Children (ADIS-C) and its parent version (ADIS-P) (Silverman & Nelles, 1988). All anxious children in the study fulfilled the criteria for a principal diagnosis of either separation anxiety disorder (SAD) (n = 37), overanxious disorder (n = 57), simple phobia (n = 27), or social phobia (n = 31) according to DSM-III-R criteria (APA, 1987). A total of 152 anxious children and their parents were interviewed separately by two independent clinicians. Each clinician then watched a video of the other's interview before being required to reach a consensus diagnosis. The overall interrater kappa agreements ranged from .65 to .94 for the anxiety diagnoses met by the children (Rapee, Barrett, Dadds, & Evans, in press). All children with additional diagnoses other than anxiety were excluded from this group as well as children currently under treatment. Comorbidity among the anxiety disorders was common, with 79% of the children having more than one anxiety disorder diagnosis.

The control groups were also interviewed with the ADIS-C and ADIS-P to exclude the presence of an anxiety disorder. These groups comprised a nonclinic sample (n = 26) and a sample who met a DSM-III-R criteria for oppositional defiant disorder (n = 27). No differences between groups were found for child's age, $F(5, 193) = 0.93$, n.s. (nonclinic, M = 10.2, SD = 2.3; overanxious disorder, M = 9.6, SD = 2.1; separation anxiety disorder, M = 9.0, SD = 2.4; simple phobia, M = 9.5, SD = 1.7; social phobia, M = 9.4, SD = 2.4; oppositional defiant disorder, M = 10.0, SD = 2.3); mother's age, $F(5, 188) = 1.08$, n.s. (nonclinic, M = 38.2, SD = 3.6; overanxious disorder, M = 38.3, SD = 5.3; separation anxiety disorder, M = 37.7, SD = 4.0; simple phobia, M = 38.6, SD = 4.7; social phobia, M = 36.4, SD = 4.3; oppositional defiant disorder, M = 39.0, SD = 5.0); father's age, $F(5, 183) = 1.33$, n.s. (nonclinic, M = 40.0, SD = 3.7; overanxious disorder, M = 40.5, SD = 4.9; separation anxiety disorder, M = 39.9, SD = 4.7; simple phobia, M = 41.8, SD 8.2; social phobia, M = 38.2, SD = 5.3; oppositional defiant disorder, M = 41.3, SD = 6.2); number of siblings, $F(5, 193) = 1.2$, n.s. (nonclinic, M = 2.6, SD = 1.7; overanxious disorder, M = 1.6, SD = 1.3; separation anxiety disorder, M = 2.0, SD = 1.8; simple phobia, M = 2.2, SD = 1.6; social phobia, M = 2.0, SD = 2.0; oppositional defiant disorder, M = 2.2, SD = 2.0); or socioeconomic status, $F(5, 193) = 0.82$, n.s. (nonclinic, M = 3.0, SD = 1.8; overanxious disorder, M = 3.3, SD = 1.8; separation anxiety disorder, M = 3.2, SD = 1.7; simple phobia, M = 3.2, SD = 2.3; social phobia, M = 4.0, SD = 2.4; oppositional defiant disorder, M = 3.6, SD = 1.7). There were also no significant differences between groups for sex, $\chi^2(1, N = 199) = 1.59$, n.s. (overall 107 boys and 92 girls), and marital status of their parents $\chi^2(1, N = 199) = 3.08$, n.s.

Procedure

After diagnostic interviews, children and their parents were interviewed separately regarding their interpretations and plans of response to a number of ambiguous situations. When interviewing children, the experimenter (a psychologist naive to the child's diagnosis) used the following scripts: "I am going to tell you about some situations you might find yourself in and ask you what you would think and do about them. This is not an exam because there are no right or wrong answers. If you do not understand anything please feel free to ask." The experimenter was instructed to praise the child's cooperation regardless of type of answer in order to avoid reinforcement of anxious or nonanxious responses. The instructions to parents were as follows: "I am going to read to you a number of hypothetical situations your child may find himself/herself in. For each situation I will ask you some questions about what you think your child might do if he/she were to experience those situations." All procedures described above were videotaped for later coding.

The materials consisted of 12 ambiguous situations that could be interpreted as either threats or nonthreats. Half of the ambiguous situations referred to physical threats and half to social threats. These situations were read in random order to the children and parents separately and three questions were asked following each situation:

- "What do you think is happening?" [free-choice interpretation]
- "Which of the following explanations do you think is most likely?" [forced-choice interpretation; two threat and two neutral interpretations were read to the child/each parent in random order]
- "What would you do about it? [What would your child do about it?—solution]

In addition to the questions asked about each of the 12 situations, two of these situations (one physical and one social) were selected to be the focus of brief family discussions. Each family discussion included parents and child and the latter was instructed to present a final solution (what he/she would do about it) at the end of the family discussion. A detailed description of the two ambiguous situations used for the family discussions is outlined below:

Physical Threat. "On the way to school you (your child) feel funny in the tummy. What do you think is happening? Which of the following explanations do you think is most likely? (a) You ate some bad food and are going to be really sick at school, (b) There is something wrong with your tummy and you might need a big operation, (c) You did not have enough breakfast and you need to eat something, or (d) It is okay and it will go away soon. What would you (your child) do?"

Social Threat. "You see a group of students from another class playing a great game. As you (your child) walk over and want to join in, you notice that they are laughing. What do you think is happening? Which of the following explanations do you think is most likely? (a) They are telling secrets about you, (b) They will soon ask you to join in, (c) One of them is likely to rush up and push you away, or (d) One of them is likely to notice you and smile. What would you (your child) do?"

The two family discussions, of 5-min duration each, followed the ambiguous situations interviews. The parents were instructed to help the child decide how to deal with each ambiguous situation. At the end of each of these discussions the child was asked to provide a final solution. The content of these solutions was recorded for later comparison with those previously suggested by the child in response to the initial, individual protocol of the same ambiguous situations questions.

Measures

The measures derived were the mean number of threat interpretations (overall, physical and social threat) provided by the parents and the children in each group, and the mean number of avoidance, aggressive, and proactive responses to 12 ambiguous situations.

The types of explanation each participant gave to the first two questions were scored as threat if they indicated potential social threats (e.g., "They think I am dumb and will laugh at me") or physical threats (e.g., "He is angry and might want to hit me"). They were scored as nonthreats if they provided either neutral or positive explanations (e.g., "He wants to thank me for my help"). The types of solutions suggested were scored as prosocial (any solution which recommended a constructive, prosocial solution), aggressive (any solution which suggested a course of action that was potentially harmful or embarrassing to others), or avoidant (any solution which suggested actions that allowed escape from or avoidance of potentially harmful or embarrassing situations). Scenarios were scored independently by two psychologists, naive to the child's diagnostic status. It was planned that any scoring disagreements between the two raters would be reconciled by discussion to achieve a consensus scoring; however, no disagreements occurred.

For the family discussions procedure, the measures were percentages of children, mothers, and fathers in each group choosing avoidant, aggressive, or prosocial responses before family discussions. The same applied to children only, after the family discussions, since each child was instructed to provide the final solution at the end of family discussions.

The Child Behavior Checklist (Achenbach & Edelbrock, 1991) is a well-known and researched, psychometrically sound, 118-item scale that assesses specific child behaviors from the parent's perspective. In the present study it was used with both mothers and fathers. The CBCL provides a total behavior problem score, several subscale scores, and scores on two dimensions of dysfunction: internalizing (e.g., anxious, depressed, withdrawal) and externalizing (e.g., aggression, impulsivity). Only the internalizing and externalizing scores were used in this study.

RESULTS

Data were analyzed for both the free-response and forced-choice threat interpretations and response plans. However, the results obtained were highly similar and thus only the results for the free-choice data are presented. For each type of measure, differences between groups were compared using one-way analyses of variance (ANOVAs) for data from parents and children independently. To allow for the analysis of multiple dependent measures, ANOVAs were tested at $p < .01$. Significant ANOVAs were followed by Tukey's HSD tests at $p < .05$ to examine specific differences between groups.

Overall Differences Between Groups

Table I shows the mean number of threat, avoidant, and aggressive solutions mean scores across anxious (all anxiety diagnoses collapsed), nonclinic, and oppositional groups. Group differences were found on threat scores for children, $F(2, 176) = 18.9$, $p < 0.01$; mothers, $F(2, 174) = 24.1$, $p < 0.01$; and fathers, $F(2, 135) = 23.4$, $p < 0.01$. Follow-up comparisons showed that, for childrens', mothers', and fathers' threat scores, all groups were significantly different from each other, with the nonclinic group showing the lowest threat scores and the oppositional group the highest. Group differences were also found on avoidance solution scores for children, $F(2, 176) = 9.2$, $p < 0.01$; mothers, $F(2, 174) = 9.2$, $p < 0.01$; and fathers $F(2, 135) = 17.2$, $p < 0.01$. Follow-up comparisons showed that for childrens', mothers', and fathers' avoidance scores the anxious group were significantly higher than both the oppositional and nonclinic groups. For aggressive solutions scores, group differences were found for children, $F(2, 176) = 44.1$, $p < 0.01$; mothers, $F(2, 174) = 38.2$, $p < 0.01$; and fathers, $F(2, 135) = 120.0$, $p < 0.01$. Follow-up comparisons showed that for childrens', mothers', and fathers' aggression scores the oppositional group were significantly higher than both the anxious and nonclinic groups.

Table I. Means and Standard Deviations for Threat, Avoidant and Aggressive Solutions Across Anxious, Nonclinic, and Oppositional Groups[a]

	Anxious	Nonclinic	Oppositional
Threat			
Child			
M	5.8[a]	3.5[a]	8.2[a]
SD	2.6	3.1	2.7
Mother			
M	3.9[a]	1.9[a]	7.3[a]
SD	2.2	2.0	3.5
Father			
M	3.8[a]	2.0[a]	7.9[a]
SD	2.6	2.3	3.9
Avoidance			
Child			
M	2.3[ab]	0.7[a]	0.8[b]
SD	2.5	0.9	0.9
Mother			
M	3.1[ab]	0.5[a]	0.5[b]
SD	2.7	0.7	0.8
Father			
M	3.5[ab]	0.2[a]	0.5[b]
SD	3.1	0.6	1.0
Aggression			
Child			
M	0.4[a]	0.3[b]	4.4[ab]
SD	0.8	0.6	4.9
Mother			
M	1.2[a]	0.1[a]	4.8[a]
SD	1.5	0.3	4.3
Father			
M	1.1[a]	0.1[b]	8.0[ab]
SD	1.3	0.5	3.9

[a]Means with the same superscripts (a, b) are different from each other using Tukey's HSD test at $p < 0.05$.

Differences Between Anxiety Groups

Table II shows threat and avoidance scores for each of the anxious groups, grouped on the basis of primary diagnosis, for children and their parents for the social situations. No group differences were evident on threat scores for children, $F(3, 122) = 2.9$, n.s.; mothers, $F(3, 120) = 1.8$, n.s.; or fathers, $F(3, 96) = 2.0$, n.s. For avoidant solutions to the social situations, no group differences were found for children, $F(3, 122) = 1.0$, n.s. However, group differences were found for mothers, $F(3, 120) = 6.4$, $p < 0.01$, and fathers, $F(3, 96) = 9.0$, $p < 0.01$. Follow-up comparisons

Table II. Social Threat and Avoidant Solutions Mean Scores Across Anxiety Diagnostic Groups[a]

	OAD	SAD	SP	SocP
Threat				
Child				
M	3.5	2.6	2.3	3.1
SD	1.6	1.4	2.2	1.5
Mother				
M	1.8	1.7	2.2	1.2
SD	1.6	1.4	1.2	1.2
Father				
M	2.1	1.2	2.0	1.4
SD	2.0	1.3	1.3	1.3
Avoidance				
Child				
M	1.4	1.1	0.8	1.5
SD	1.7	1.0	1.0	1.7
Mother				
M	1.9^{a}	1.5^{b}	1.3^{c}	3.2^{abc}
SD	1.8	1.4	1.2	2.1
Father				
M	2.2^{a}	1.4^{b}	1.1^{c}	3.7^{abc}
SD	2.1	1.3	1.1	2.1

[a]Means with the same superscripts (a, b, c) are differently different from each other using Tukey's HSD test at $p < 0.05$. OAD = overanxious disorder; SAD = separation anxiety disorder; SP = simple phobia; SocP = social phobia.

showed that mothers and fathers in the social phobia group expected their children to give a significantly higher number of avoidant responses than mothers and fathers of children with other anxiety diagnoses.

Table III shows threat and avoidance scores for anxious children and their parents, again based on primary diagnosis, for the physical situations. Group differences were found on threat scores for children, $F(3, 122) = 5.5$, $p < 0.01$, but not for mothers, $F(3, 120) = 0.8$, n.s., or fathers, $F(3, 96) = 0.9$, n.s. Follow-up comparisons showed that children with simple phobia and overanxious disorder gave significantly more threat interpretations than children with separation anxiety disorder. For avoidant solutions to the physical situations, group differences were evident for children only, $F(3, 122) = 6.4, p < 0.01$. Follow-up comparisons showed that, for children, the simple phobic group had significantly higher avoidance scores than children in any other anxiety group.

Comparing levels of social and physical threat within diagnoses, a significant difference was found for the SAD group only, $t(36) = 2.08$, $p < .05$, who interpreted more threat for social than physical situations, and a

Table III. Physical Threat and Avoidant Solutions Mean Scores Across Anxiety Diagnostic Groups[a]

	OAD	SAD	SP	SocP
Threat				
Child				
M	3.1[a]	2.1[ab]	3.8[b]	2.6
SD	1.5	1.4	2.0	1.2
Mother				
M	2.0	2.1	2.5	2.2
SD	1.5	1.0	1.2	0.9
Father				
M	2.3	1.9	2.5	1.9
SD	1.7	1.4	1.4	1.0
Avoidance				
Child				
M	1.0[a]	0.5[b]	2.4[abc]	1.6[c]
SD	1.8	1.2	2.5	0.7
Mother				
M	1.0	0.8	1.7	1.2
SD	1.6	1.0	1.7	1.3
Father				
M	1.7	0.9	1.8	1.3
SD	2.0	1.0	2.0	1.0

[a]Means with the same superscripts (a, b, c) are differently different from each other using Tukey's HSD test at $p < 0.05$. OAD = overanxious disorder; SAD = separation anxiety disorder; SP = simple phobia; SocP = social phobia.

borderline difference for the simple phobia group ($p < .06$), who interpreted more threat for physical than social situations. Comparing levels of social and physical avoidance within diagnoses, significant differences were found for the SAD, $t(36) = 2.52, p < .05$; the simple phobia, $t(19) = -2.28$, $p < .05$; and the social phobia groups, $t(27) = 2.52$, $p < .05$. The SAD and social phobia groups were more avoidant of social situations whereas the opposite was true for the simple phobics.

In consideration of the high levels of comorbidity that existed in the anxious groups, threat and avoidance were again analyzed using a series of ANOVAs in which the independent variable was a dummy dichotomous variable comparing the presence of each diagnosis, anywhere in the child's profile, with the absence of that diagnosis. Thus, the first ANOVA compared children having overanxious disorder anywhere in their profile with children who received no diagnosis of overanxious disorder. The same was done for separation disorder, simple phobia, and avoidant disorder. The results were essentially the same as the analyses using primary diagnosis, and thus details of all the analyses are not presented. For threat, the only

significant difference was that the separation anxiety disorder group was lower than nonseparation anxiety disorder children on physical threat. For avoidance, the social phobia group scored higher on social avoidance according to mothers and fathers, and the simple phobia group scored higher on physical avoidance according to the children, mothers, and fathers.

Relationship Between Threat and Avoidance

To examine the relationship between interpretation and response, we calculated the proportion of avoidant versus nonavoidant, and aggressive versus nonaggressive, responses, given that the children had made a threat interpretation to the ambiguous situation. The percentages of threat interpretations that were followed by avoidant plans were nonclinic (M = 14.5, SD = 19.4), anxious (M = 23.4, SD = 29.0), and oppositional group (M = 6.9, SD = 9.5). An analysis of variance indicated significant differences between the groups, $F(2, 166) = 4.82$, $p < 0.01$, and a follow-up Tukey showed that a significant difference only existed between the anxious and the oppositional groups. Thus, the oppositional children were less likely than the anxious children to respond to threat interpretation with avoidance.

The percentages of threat interpretations that were followed by aggressive responses were nonclinic (M = 5.5, SD = 11.5), anxious (M = 4.3, SD = 9.3), and oppositional (M = 41.8, SD = 43.0), $F(2, 166) = 43.13$, $p < 0.01$. A follow-up Tukey showed the oppositional children were more likely to follow a threat interpretation with aggression than both other groups.

Similar analyses were conducted for instances in which the children had not made a threat interpretation. The percentages of these followed by avoidance were nonclinic (M = 5.2, SD = 9.1), anxious (M = 12.2, SD = 17.0), and oppositional (M = 7.2, SD = 13.4). An ANOVA showed no significant differences between groups. The percentages of aggressive responses following nonthreat interpretations were nonclinic (M = 1.4, SD = 4.2), anxious (M = 3.5, SD = 11.5), and oppositional (M = 6.9, SD = 13.9). Again, the ANOVA was not significant. Thus, from earlier results it appears that both clinic groups could be differentiated from the nonclinic group on the basis of the amount of threat interpretation. Given that an interpretation of threat had been made, the oppositional children could be differentiated from the other two groups because of their predilection for aggression, but the anxious children were not distinguishable from the nonclinic children.

Relationship Between CBCL, Interpretations, and Solutions

Previous analyses used a categorical grouping of participants, that is, the DSM-III-R diagnoses, as the independent variable. It is also of interest to examine differences in threat, avoidance, and aggression in relation to dimensions of dysfunction that cut across the diagnostic groupings. Thus, Table IV shows correlations between threat, avoidance, and aggression and internalizing and externalizing dimensions of the CBCL for both mothers' and fathers' reports. Threat interpretation was correlated with both internalizing and externalizing scores for the social situations, reinforcing our earlier finding that both anxious and oppositional children make high levels of threat interpretation. No significant correlations between avoidance scores and either dimension of the CBCL were found. As expected, aggression scores correlated with the externalizing dimension only.

Differences Between Groups Pre- and Post-Family Discussions

Table V shows the mean percentages of children, mothers, and fathers choosing avoidant and aggressive solutions before the family discussions and the mean percentages of children in the anxious, oppositional, and nonclinic groups choosing avoidant and aggressive solutions (for both physical and social scenarios) before and after family discussions. The family discussion was associated with a large increase in the percentage of anxious children choosing an avoidant solution to a level in excess of that chosen

Table IV. Correlations for Total Sample Between CBCL Internalizing/Externalizing Scores and Threat Interpretation, Avoidance, and Aggressive Solutions

	CBCLmI	CBCLfI	CBCLmE	CBCLfE
Threat	.31[b]	.21[b]	.32[b]	.23[b]
Threat social	.38[b]	.26[b]	.37[b]	.29[b]
Threat physical	.12	.07	.13	.07
Avoidance	.06	.00	−.04	−.08
Avoidance social	.18	.08	.12	.07
Avoidance physical	−.06	−.06	−.15	−.18
Aggression	.04	.07	.17	.20[b]
Aggression social	.03	.06	.12	.19
Aggression physical	.05	.06	.20[b]	.19

[a]CBCL = Child Behavior Checklist; m = mother; f = father; I = internalizing; E = externalizing.
[b]$p < .05$.

Table V. Mean Percentages of Children Choosing Avoidant and Aggressive Solutions Pre- and Post-Family Discussions

	Anxious	ODD[a]	Nonclinic
% Avoidant solutions			
Pre-discussion—mothers	33.5	12.9	13.4
Pre-discussion—fathers	36.5	9.5	5.9
Pre-discussion—children	29.7	20.3	17.3
Post-discussion—children	67.8	9.2	5.7
% Aggressive solutions			
Pre-discussion—mothers	5.6	40.7	0.0
Pre-discussion—fathers	8.5	69.0	0.0
Pre-discussion—children	4.7	35.1	5.7
Post-discussion—children	4.3	79.6	0.0

[a]ODD = oppositional defiant disorder.

by any family member prior to the family discussion. For oppositional children, the family discussion was associated with a decrease in avoidant solutions and an increase in the selection of aggressive solutions to a level in excess of the level of aggression chosen by children, mothers, and fathers prior to the family discussion. For nonclinic children, family discussions were associated with decreases in both percentages of avoidant and aggressive solutions.

DISCUSSION

The first aim of the present study was to assess threat interpretation bias in clinically anxious children in comparison with nonclinic and oppositional children. Our data clearly support a bias in the anxious compared to the nonclinic children. These data for children are similar to findings reported by Butler and Mathews (1983) with anxious adults. Anxious children appear to be more prone to interpret ambiguous situations in a threatening manner than nonclinic children. Preliminary data from another laboratory using the same procedure are consistent with these findings (Chorpita, Albano & Barlow, 1993). Thus, it appears that at least some of the cognitive processes that discriminate anxious from nonanxious adults (e.g., Butler & Mathews, 1983) may have their origins in childhood.

However, there is an important qualification to our finding of a threat bias in anxious children. Threat bias was even more pronounced in the oppositional defiant children, in agreement with the work of Dodge (1986)

with aggressive children, indicating that both anxious and oppositional children interpret threat more than their nonclinic counterparts. These data using diagnostic groupings were supported by the CBCL questionnaire scores which indicated that both internalizing and externalizing dimensions correlated with threat scores, especially for social situations. Researchers looking at anxious adults have failed to include such clinic-referred, nonanxious control groups (apart from depressed samples), and thus it may have been erroneously assumed that a threat bias is specific to the anxiety disorders. However, some research using adult antisocial populations has also indicated a cognitive bias toward threat in this group (Blackburn & Lee-Evans, 1985; Sterling & Edelmann, 1988). Our results indicate that further research into information processing biases in clinic populations should utilize more extensive controls than simply nonclinic populations.

The second aim of the study was to examine anxious children's selection of action plans in response to ambiguous situations, in comparison with both nonclinic and oppositional children. Anxious children differed from both the oppositional and nonclinic children in how they responded to ambiguous situations. While oppositional children displayed high rates of aggressive responses, anxious children responded with high rates of avoidance. When the relationship between threat and avoidance was examined, however, it was evident that there was no difference between the anxious and nonclinic children on the rate of avoidance, given that they had made a threat interpretation. Thus, the key factor differentiating anxious from nonclinic children on this task may be threat interpretation, with avoidance being a natural consequence of this threat interpretation. In contrast, the key factor differentiating anxious from oppositional children appears to be their response to threat.

Our analyses of the anxiety subgroups indicated reliable differences within diagnostic subgroups of the anxious population in terms of response plans, but less so for threat interpretation. Further, these differences between the anxious subgroups may need to be considered with reference to the nature of the ambiguous situation, that is, whether it represented a social or physical scenario. While only one significant difference was found in threat interpretation between the anxious groups regarding physical or social threat, which was that the separation anxiety group interpreted lower physical threat than the nonseparation anxious group, responses to either physical or social threat were differentiating factors between anxiety diagnoses. In respect to the social situations, parents of social phobic children expected their children to provide more avoidant plans of action than the other anxious groups. The same pattern applied to children with simple phobia and their parents in their avoidance responses to physical threat situations.

These results corroborate the argument that, at the level of internal representation, feared negative outcomes might be organized in terms of two primary factors, physical and social (Campbell & Rapee, 1994; Lovibond & Rapee, 1993). In order to explain the physical/social dichotomy, these authors proposed a model of conceptualization of anxiety disorders at the level of outcomes, rather than stimuli, and that different stimulus situations produce different anxiety symptomatologies due to the potential negative outcomes they signal and response plans the children formulate.

Parental results mirrored those of their children in all groups. That is, the parents of anxious children made similarly high levels of threat interpretation, and predicted their children would select high rates of avoidant response. The parents of oppositional children made relatively high rates of threat interpretation and predicted their childrens' aggressive responses, and the parents of nonclinic children made low levels of threat interpretation and predicted their childrens' low levels of avoidant and aggressive response. These findings may indicate that children might be learning to interpret and respond to certain situations within their family contexts. The children's dysfunctional response patterns (avoidant–anxious, aggressive–oppositional) might be maintained and fueled by parental reinforcing expectations and modeling of negative behaviors (reassurance, overprotection with anxious children; aggression, hostility with oppositional children).

The results of the effects of the family discussions provided further indication of the possible family role in the maintenance of dysfunctional anxious and aggressive behavior. We investigated what would happen to a child's original plan of action after a family discussion about what to do in a specific situation. The results showed that, for anxious children, avoidance increased greatly after family discussions. A similar phenomenon occurred for oppositional children in that the proportion of these children choosing aggressive solutions increased after the family discussions. With nonclinic children, family discussions reduced both avoidance and aggression solutions. This was not simply a result of the children coming to agree with their parents since the percentage of children providing avoidant solutions after family discussions was greater than the percentage of children and the percentage of parents offering an avoidant solution before family discussion. It seems that the family may play an important role in a child's choice of problem-solving strategy, and that avoidance may be reinforced in families with anxious children and aggression in families with oppositional children. Thus, this study provides the first evidence of family enhancement of avoidant and aggressive response (FEAR effect) in children. Further information about the content of the family discussions can be found in Dadds et al. (in press).

The methodology of using a cognitive task followed by family discussion and then repetition of the cognitive task appears to have enormous potential for studying the family processes that provide a context for the development of various forms of childhood psychopathology. Theoretically, the results obtained using this methodology support the need to conceptualize childhood anxiety and aggression using an integration of information-processing and family-based social learning models. The anxious children's cognitive interpretative biases and avoidant response patterns may be part of a family style of processing ambiguous information in which threat perception and avoidance patterns may be modeled and reinforced. Future studies could investigate how parents and other nonclinic siblings respond when the ambiguous threat situations apply to themselves to clarify whether threat and avoidance bias are more functions of the anxiety symptomatology of a particular child, or of the family information processing style, or of both. Further, and considering the limitations of the present analog study, future research of meaningful behaviors in real-life situations would promote knowledge of family processes in natural environments.

Clinically, the present study's findings reinforce the importance of involving families in the treatment of anxious children (Barrett et al., in press). Perhaps, by teaching parents positive reinforcing contingencies and appropriate modeling behaviors, clinicians can maximize the likelihood that cognitive-behavioral work with the child (e.g., Kendall, 1994) will be reinforced and maintained within the family environment. Moreover, if courageous, nonfearful behaviors become part of not only the child's but also the family's repertoire, the child's chances of successful generalization of such behaviors into other settings and over time may be increased.

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