

Parent-Child Relationships and the Verbal Information Pathway to Fear in Children: Two Preliminary Experiments

Andy P. Field, Jess E. Ball, Nicola J. Kawycz and Harriett Moore

University of Sussex, UK

Abstract. Parenting styles and the parent-child bond are associated with anxiety in children. Despite this association, little is known about the mechanism through which parenting has its effect. One possibility is that parenting interacts with other known pathways to fear. Two experiments are reported that look at the interaction between parenting styles and parent-child relationships and the verbal information pathway to fear. In Experiment 1, a punitive maternal parenting style was found to interact with the effect of threat information about a novel animal in 6–9-year-old children. Maternal warmth, neglect, overprotection and accurate monitoring were not found to have a significant effect. Experiment 2 showed that children reporting a greater number of negative interactions with their fathers had greater increases in fear beliefs about novel animals after both threat and no information. The quality of mother-child relationships did not significantly interact with the verbal information pathway. These experiments offer preliminary evidence that parenting practices influence how children react to negative information, which offers some insight into the potential causes of the association between parenting and anxiety in children.

Keywords: Childhood anxiety, parental behaviour, information processing.

Introduction

Anxiety is probably the most prevalent psychological disorder of childhood with reported rates varying from 2.6% to extremes of 41.2% (and even ignoring this extreme, rates up to 23.9% are found in the literature: see Cartwright-Hatton, McNicol and Doubleday, 2006). Childhood anxiety is a distressing condition in its own right and affects both academic and social functioning (Pine, 1997), but childhood anxiety disorders also frequently develop into their adult counterparts (e.g. Kim-Cohen et al., 2003). As such, it is becoming increasingly important to understand the origins of childhood fear and the role that the family plays in protecting against or creating anxiety. Anxiety appears to run in families (Turner, Beidel and Costello, 1987), yet only between one- and two-thirds of this association can be explained by genetic factors (Eley et al., 2003). The remaining variance is attributable to environmental influences, and two important influences on a child's environment are parenting practices and the child-parent bond. As such, these factors have been seen as important in explaining, in part, the intergenerational transmission of anxiety (see Bögels and Brechman-Toussaint, 2006).

Reprint requests to Andy P. Field, Department of Psychology, University of Sussex, Falmer, Brighton BN1 9QH, UK.
E-mail: andyf@sussex.ac.uk

© 2007 British Association for Behavioural and Cognitive Psychotherapies

Anxious parents are known to be more withdrawn during laboratory-based activities with their children (Woodruff-Borden, Morrow, Bourland, and Cambron, 2002; Turner, Beidel, Roberson-Nay, and Tervo, 2003). Whaley, Pinto and Sigman (1999) also showed that anxious mothers exhibit less positive, warm interactive behaviour and are more critical than non-anxious control mothers. Their own anxieties cause a certain parenting style that facilitates the development of the same condition in their child. Anxious parents can also grant their children less autonomy in decisions and activities than controls (Hirshfeld, Biederman, Brody, Faraone and Rosenbaum, 1997). These observations have led to some interest in how parenting practices (regardless of whether the parent is anxious) contribute to childhood anxiety. There is now a good deal of evidence to suggest that parenting styles characterized by lack of warmth and acceptance, by overcontrol and overprotection, and high levels of criticism, may be risk factors for anxiety in offspring (see Bögels and Brechman-Toussaint, 2006; Wood, McLeod, Sigman, Hwang, and Chu, 2003, for reviews). As Field and Cartwright-Hatton (2006) point out, the “overcontrolling” and “overprotective” parenting are terms that are used inconsistently in the literature; however, they have in common that they describe parenting that allows the child little autonomy in their beliefs and behaviour. For example, the parent tries to exert control over how the child views and interacts with the world. Wood *et al.* (2003), in a review of the literature, concluded that critical and rejecting parenting is closely associated with childhood anxiety. This type of parenting is characterized by excessive critical comments towards the child, excessive punishment of undesired behaviour, and a lack of warmth or use of praise for desirable behaviour.

However, Field and Cartwright-Hatton (2006) noted that although negative parenting styles correlate with childhood anxiety, and are one of many possible routes through which fears are acquired, they are not in themselves mechanisms through which fears are acquired. Instead, negative parenting practices, amongst other experiences, provide the child with an unusual array of learning experiences. As such, they hypothesize that the mechanism of fear transmission is not the parenting practices, *per se*, but the learning processes into which parental behaviour feeds. To this end, they propose a model of the intergenerational transmission for fear in which parental cognition and behaviours filter through to their children through established pathways to fear, such as verbal information, vicarious learning and perhaps even, in extreme cases, direct traumatic experiences (see also Fisak and Grills, *in press*). The first step to test these ideas would be to take an established paradigm for investigating these pathways to fear and to see whether parenting interacts with these pathways to fear.

Rachman’s (1977) verbal information pathway to fear has much evidence to support it (see Ollendick and King, 1991 for a review). However, it is only recently that prospective experiments have been designed that manipulate verbal information about novel stimuli to see the effect that it has on children’s fear beliefs and behaviours. Field, Argyris and Knowles (2001) gave 7–9-year-old schoolchildren either positive or threat information about previously un-encountered toy monsters. Children’s fear beliefs towards the monster about which they had received threat information significantly increased. Field and Lawson (2003) extended this paradigm to use novel animals (the cuscus, quokka and quoll, all of which are Australian marsupials) about which children received positive, threat or no information. Over several studies, the effects of verbal information on cognitive, physiological and behavioural components of the fear emotion (see Lang, 1985) have been explored. Threat information significantly increased children’s fear beliefs as indexed by self-report (Field, 2006b; Field and Lawson, 2003; Field, Lawson and Banerjee, 2006), by indirect attitude measures in the

form of a reaction time task (Field and Lawson, 2003; Field et al., 2006). These beliefs lasted up to 6 months (Field et al., 2006; see also Muris, Bodden, Merckelbach, Ollendick and King, 2003). Threat information significantly increased behavioural avoidance measured by reluctance to approach a box in which the child believed there was a marsupial (Field and Lawson, 2003; Field, 2006a) and increased heart rate during this task (Field and Schorah, in press). Verbal information also appears to be able to create cognitive biases similar to those found in clinically anxious adults: Field (2006a, b) used a picture dot-probe task to demonstrate attentional biases in children towards animals that had previously been the subject of verbal threat information. Finally, verbal information appears to interact with temperament: self-report indices of trait anxiety moderated the effect of threat information on both induced attentional biases and avoidance behaviour in children (Field, 2006a).

This paradigm lends itself to investigate how parenting practices and the parent-child relationship affect the way in which a child changes their fear beliefs following negative information. The two experiments reported here use Field and Lawson's (2003) threat information paradigm but add in child measures of specific maternal parenting styles (Experiment 1) and general positive or negative mother-child and father-child bonds (Experiment 2). Generally, we predict that negative parenting practices (such as being overprotective or punitive) and parent-child relationships (for example, whether the child perceives their interactions with their parents to be positive or negative) will lead to greater increases in fear beliefs following threat information.

Experiment 1

Experiment 1 investigates the interaction between parenting styles and threat information by using a child-report measure of five parenting styles: warmth, punitive parenting, overprotection, accurate monitoring, and neglect. It is predicted based on the literature already described that a punitive and overprotecting parenting style will increase the effect of threat information. Warmth should decrease the influence of negative information. Accurate monitoring and neglect should not interact with threat information.

Method

Participants

Forty-one children participated (24 male and 17 female), all aged 6–10 years ($M = 102.63$, $SD = 15.53$ months). They were recruited from a school in Leigh-on-Sea, Essex, UK. Parental consent was obtained for each child. In both experiments reported here, the age range was chosen based on evidence that animal fears typically develop at this age (e.g. Field and Davey, 2001). However, past research has not shown that different age groups are differentially affected by negative information about animals (see Field et al., 2006).

Materials

Animals. Pictures of three Australian marsupials, the quoll, the cuscus and the quokka were used (see Field and Lawson, 2003). These were animals about which the children had no prior

experience and to which they had no prior fear expectations. In both experiments children were asked initially whether they had heard of any of the animals; none had.

Information. The two sets of information (one positive, one threat) used by Field and Lawson (2003) were used: the two vignettes are almost exactly matched for length and word frequency (see Appendix A).

Fear Beliefs Questionnaire (FBQ). The FBQ used by Field and Lawson (2003) was used: this consists of 21 statements (7 repeated once for each animal) about the animals, each with a 5-point Likert response scale (see Field and Lawson, 2003). This questionnaire produces a fear belief score for each animal ranging from 0 (no fear belief) to 4 (maximum fear belief). The subscales of this questionnaire have high internal consistency across a variety of studies (see Field, 2006b for details): α ranging from .70 to .98 (cuscus subscale), .71 to .98 (quokka subscale) and .66 to .98 (quoll subscale). The internal consistencies in the current sample were consistent with these values $\alpha = .96$ (cuscus subscale), .95 (quokka subscale) and .73 (quoll subscale). This questionnaire has been used on numerous occasions in children aged between 6 and 12 (e.g. Field and Lawson, 2003; Field 2006b; Field et al., 2006).

The Parenting Style Questionnaire (PSQ). The Parenting Style Questionnaire (PSQ; Smith, Padley, Bowers and Binney, 1993) was used to assess the children's perceptions of parental style. The PSQ is a version of the Parental Bonding Instrument (Parker, Tupling and Brown, 1979), adapted for use with children. The test examines five parenting styles: Warmth, Punitiveness, Overprotection, Accurate Monitoring, and Neglect. Children are given 30 cards one at a time onto which a statement is printed reflecting one of the five parenting styles: warmth (e.g. "Shows she loves me"), punitiveness (e.g. "Often threatens to punish me"), overprotection (e.g. "Tries to tell me what to do all the time"), accurate monitoring (e.g. "Wants to know who my friends are, who I am with"), and neglect (e.g. "Does not mind if I do dangerous things"). The child was asked to post each card into one of three boxes labelled "A lot like my mum", "A bit like my mum", and "Not at all like my mum" on the front. The boxes were scored 3, 2, and 1 respectively. Atzaba-Poria, Pike and Deater-Deckard (2004) found that this test had good internal consistency for the Warmth ($\alpha = .65$) and Punitiveness ($\alpha = .70$) in mothers. They found the other three sub-scales to have low internal consistency. In the current sample, the internal consistencies were $\alpha = .35, .85, .72, .71$, and .65 for warmth, punitiveness, overprotection, accurate monitoring, and neglect respectively.

Procedure

The children were randomly allocated to one of three counterbalancing orders (the type of information given about the animal is in brackets): (1) cuscus (negative), quokka (positive), quoll (no information); (2) quokka (negative), quoll (positive), cuscus (no information); and (3) quoll (negative), cuscus (positive), quokka (no information). Therefore, across groups, all types of information were associated with all animals.

The whole task was computerized using custom software written (by the first author) in Visual Basic.net. First the FBQ was administered: the computer screen showed a named picture of the animal under which a question appeared. Children responded to the question by clicking on one of five screen buttons with the labels "No, not at all", "No, not really", "Don't Know/Neither", "Yes, probably", "Yes, definitely". A button labelled "Sure?" appeared and children clicked this button to confirm their response and move to the next question. The 21 questions of the FBQ appeared in random order. Next, the screen displayed instructions

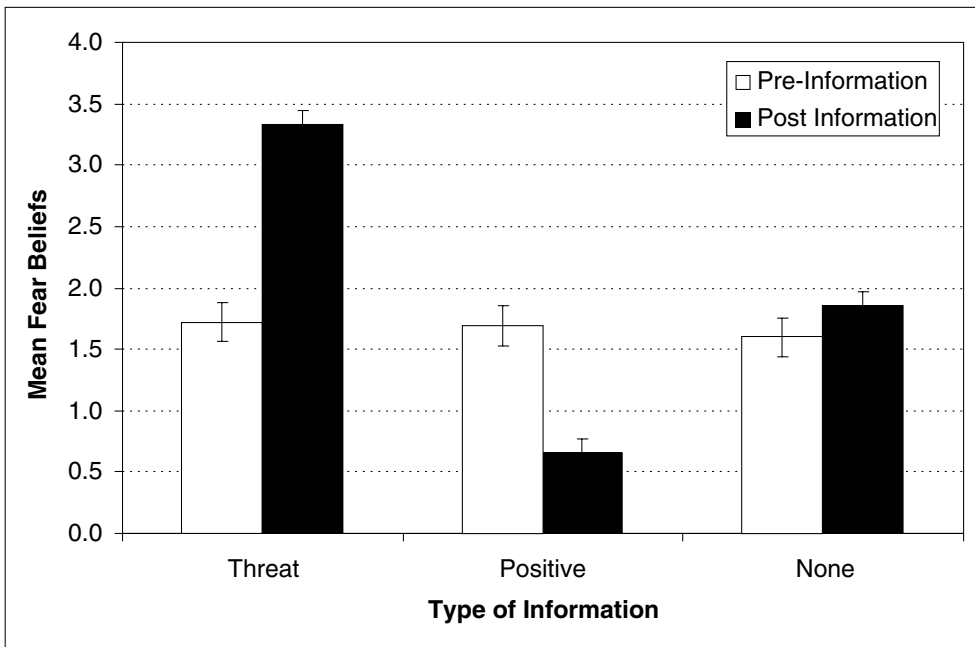


Figure 1. Graph showing the mean (and *SE*) fear-belief scores for children before and after the presentation of positive, negative, or neutral information in Experiment 1

that the participant would hear some information about the animals through headphones. A picture of an adult female (an “average” female face aged mid-20s, supplied by Professor David Perrett’s laboratory at St Andrews University, UK) appeared on the left side of the screen, and a picture of the animal they were talking about appeared on the right side of the screen. Children heard the information through headphones from a pre-recorded MP3 file voiced by a female in her mid 20s. The counterbalancing order determined the type of information presented about each animal. As a further counterbalancing measure, within each order, approximately half the children received the threat information first, and the other half received the positive information first. Following the information, children completed the FBQ again. The computerized task stopped here and the PSQ was administered by the female experimenter.

Results

A two-way 3 (information type: threat, positive and none) \times 2 (time: pre- vs. post-information) repeated-measures ANOVA was conducted on the average fear beliefs revealing significant main effects of both time, $F(1, 40) = 6.10, p < .05$, and type of information, $F(2, 80) = 85.93, p < .001$. More important, the time \times type of information interaction was significant, indicating that changes in fear beliefs depended on the type of information given, $F(2, 80) = 86.17, p < .001$. Contrasts breaking down this interaction revealed that fear beliefs after threat information increased significantly compared to after no information (see Figure 1),

$F(1, 40) = 45.69, p < .001$ and fear beliefs significantly decreased after positive information compared to after no information, $F(1, 40) = 48.55, p < .001$. These findings replicate the well-established effect of verbal information on fear beliefs shown by Field et al. (2001), Field and Lawson (2003), and Field (2006b).

To look at whether mother's parenting style influenced the extent to which fear information had an effect, a hierarchical multilevel model, in which children were the units of analysis, was used in which the change in fear beliefs was predicted from the type of information, and each of the five parenting styles. A multilevel model approach was chosen because it yields more interpretable parameter estimates than analysis of covariance. The model included all main effects and also the interactions between type of information and each parenting style. These interactions tell us whether the change in fear beliefs caused by different types of information were influenced by children's perceptions of their mother's parenting styles. The interactions between the type of information and warmth, overprotection, accurate monitoring and neglect were all non-significant: $F_s(2, 82.82) = 0.94, 0.17, 2.26$ and 0.66 respectively. The only parenting style that significantly influenced the effect of different types of information on fear beliefs was a punitive parenting style, $F(2, 82.82) = 3.16, p < .05$. Parameter estimates for this interaction revealed that a punitive parenting style interacted with threat information relative to no information: $b = 1.17 (SE = 0.49), t(119.74) = 2.39, p < .05, 95\%$ confidence interval = 0.20 (lower), 2.14 (upper). However, a punitive parenting style did not influence the effect of positive information compared to no information: $b = 0.31 (SE = 0.43), t(76.62) = 0.72, ns, 95\%$ confidence interval = -0.55 (lower), 1.17 (upper).

Discussion

This experiment has shown that a punitive parenting style does have some influence on the effect that threat information has on children's self-reported fear beliefs about novel animals. This was not true for positive information, which did not significantly interact with any parenting style. The punitive parenting style is the most likely to contribute to anxiety because it centres on punishment and so is likely to generate general expectancies in the child that "bad things will happen". One interpretation of the findings in Experiment 1 is that children with parents that adopt a punitive style are "primed" to take notice of threat information about novel stimuli. However, warmth and overprotection were expected to significantly interact with threat information and this was not the case. For warmth, this could be because this subscale was the least internally reliable of the five. However, for both warmth and overprotection it could be because only the cognitive component of fear was being assessed. Lang (1985) suggests that emotions are made up of three systems: subjective report or cognition; physiological (somatic and autonomic changes); and behavioural (avoidance or performance deficits). Parental warmth is associated with a child being more or less adventurous in their surroundings (Wood et al., 2003) and overprotection is associated with a lack of behavioural autonomy, so it is plausible that the effect of these parenting styles on the influence of threat information would emerge in the behavioural system and not, necessarily the cognitive.

Experiment 2

Experiment 1 looked at parenting styles and how they interact with threat information. There is also a substantial literature on the parent-child bond, usually measured in terms

of attachment styles (see Bögels and Brechman-Toussaint, 2006). Experiment 2 sought to develop Experiment 1 by using a measure of the child-parent bond rather than parenting styles per se. In addition, data from fathers as well as mothers were collected. Although research has typically focused on mothers, anxious fathers have also been found to be overprotective (Greco and Morris, 2002; Lindhout et al., 2006), and there are higher rates of anxiety in fathers of anxious children compared to control children (Cooper, Fearn, Willetts, Seabrook and Parkinson, 2006).

Method

Participants

Sixty-four children participated (32 male, 32 female) aged between 6 and 9 years ($M = 97.53$ months, $SD = 14.83$). All children completed questions about their relationship with their mother but only 55 children completed the corresponding questions about their father. Informed consent was obtained from parents on an opt-out basis.

Materials

The same pictures and information about the quoll, cuscus and quokka as in Experiment 1 were again used; as was the FBQ.

Network of Relationships Inventory (NRI). The NRI (Furman and Buhrmester, 1985) is a standardized measure of children's perceptions of their social networks. In this study, a short-form version of the questionnaire was used that has two sub-scales: support and negative interaction. Gavin and Furman (1996) used this adapted scale to measure the relationship quality of girls and their mothers and best friends, but in our study it was used to measure the quality of relationships between the child and their mother and father. This scale was used because it is one of the few scales developed that measures social relationships, it has good psychometric properties (α for both sub-scales exceeded .9 in Gavin and Furman, 1996) and it poses parallel questions for different social relations between the child, their mother, father, grandparents, siblings and friends (Furman and Buhrmester, 1985). As such, it is one of the few questionnaires that has been validated for use with fathers and mothers that produces directly comparable scores. The scale consists of 10 items that pose a question to which the child responds first for their mother and then for their father. Each item has a 5-point Likert response scale: 1 (a little), 2 (some), 3 (a lot), 4 (extremely) and 5 (the most). The support subscale consists of items such as "How much do you play around and have fun together?", and "How much do they help you work things out and fix things?", whereas the negative interaction subscale consists of items such as "How much do you argue with each other?" and "How much do you get upset with each other?"

Procedure

The procedure was ostensibly the same as Experiment 1 except that the FBQ was administered as a pen and paper questionnaire, and the female experimenter provided the information about the animals. These changes were for practical reasons, and past research has shown no differences in effects when the verbal information paradigm used in these studies is

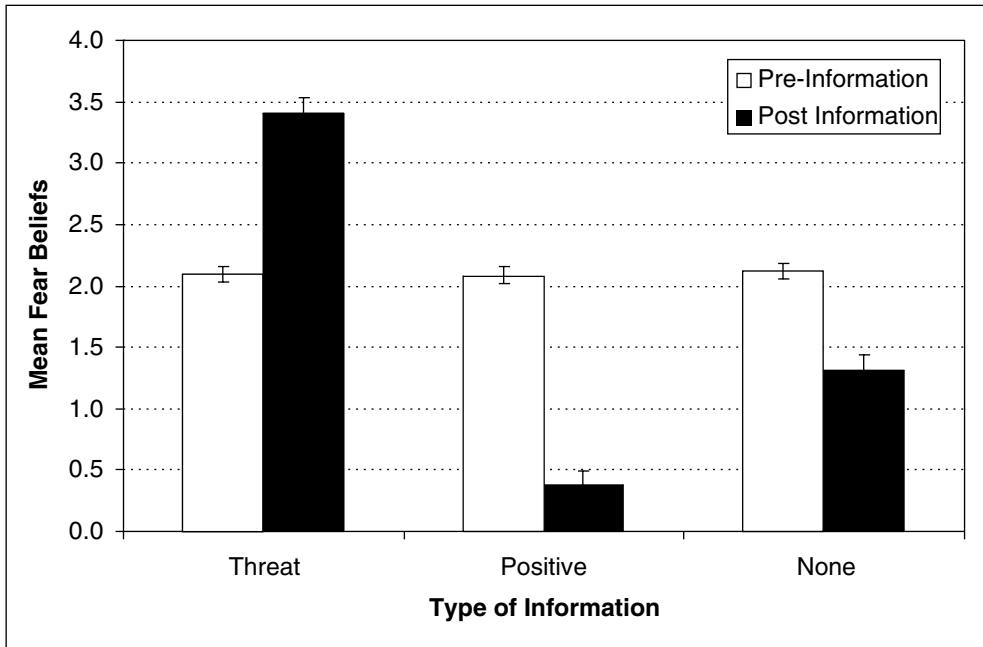


Figure 2. Graph showing the mean (and *SE*) fear-belief scores for children before and after the presentation of positive, negative, or neutral information in Experiment 2

computerized (e.g. Field, 2006b; Field et al., 2006) or not (e.g. Field, 2006a; Field et al., 2001, 2006; Field and Lawson, 2003).

Results

A two-way 3 (information type: threat, positive and none) \times 2 (time: pre- vs. post-information) repeated-measures ANOVA was conducted on the average fear beliefs revealing significant main effects of both time, $F(1, 63) = 28.45, p < .001$, and type of information, $F(2, 126) = 312.30, p < .001$. More important, the time \times type of information interaction was significant, indicating that changes in fear beliefs depended on the type of information given, $F(2, 126) = 224.49, p < .001$. Contrasts breaking down this interaction revealed that fear beliefs after threat information increased significantly compared to after no information (see Figure 2), $F(1, 63) = 201.43, p < .001$ and fear beliefs significantly decreased after positive information compared to after no information, $F(1, 63) = 42.65, p < .001$. As in Experiment 1, these findings replicate the well-established effect of verbal information on fear beliefs.

A hierarchical multilevel model was again used to look at whether relations with the mother and father influenced the effect of verbal information. Two analyses were carried out: one for data about mothers and the other for the data about fathers. The models included all main effects and also the interactions between type of information and mother's/father's support and negative interaction.

For the data regarding mothers, contrary to Experiment 1, neither support nor negative interactions influenced the effect of verbal information: $F(2, 87.69) = 0.34$, *ns* for both the Support \times type of information interaction and the negative interaction \times type of information interaction.

For the data on fathers, support from the father did not significantly interact with the effect of verbal information, $F(2, 76.37) = 0.62$, *ns*. However, negative interactions significantly influenced the effect that verbal information had on fear beliefs, $F(2, 76.37) = 3.68$. Parameter estimates for this interaction revealed that negative interactions did not significantly influence the effect that threat information had relative to no information: $b = -0.44$ ($SE = 0.38$), $t(101.98) = -1.17$, *ns*, 95% confidence interval = -1.19 (lower), 0.31 (upper). However, negative interactions with the father did significantly influence the effect of positive information compared to no information: $b = -0.87$ ($SE = 0.32$), $t(69) = -2.68$, $p < .01$, 95% confidence interval = -1.52 (lower), -0.22 (upper). These results seem counter-intuitive at face value. However, a further comparison was made that showed that negative interactions with the father did significantly influence the effect of threat information compared to positive information: $b = 0.87$ ($SE = 0.35$), $t(100.30) = 2.49$, $p < .05$, 95% confidence interval = 0.18 (lower), 1.56 (upper). Collectively, these results suggest that negative interactions with the father enhance the effects of threat information compared to positive information, but is also associated with higher fear beliefs about animals about which no information has been given.

Discussion

Experiment 2 seems to suggest that the quality of the mother-child relationship does not interact with negative information to enhance fear beliefs about novel animals, but that negative father-child interactions do lead to greater changes in fear beliefs towards both animals about which threat information has been given but also towards animals about which no information has been given. This could imply that either negative paternal interactions lead to a generalization of threat information to animals about which nothing is known, or that children who have negative paternal interactions simply hold greater fear beliefs about all new stimuli. This latter explanation is not supported by the data, which showed very small associations between negative paternal interactions and pre-information scores for the animals about which threat, positive and no information was given: $r_s = .03$, $-.12$, and $-.21$ respectively.

General discussion

These two experiments have produced some tentative evidence that parenting practices interact with one of the main pathways through which fears are thought to develop: verbal information. Theoretically, this supports the idea that parenting styles per se are not necessarily a causal influence on childhood anxiety, but interact with other learning processes to create fear cognitions. In particular, a punitive maternal parenting style seemed to specifically influence the effect that threat information has on the child. This finding is consistent with the literature showing that criticism and punishment are associated with anxiety in children (Bögels and Brechman-Toussaint, 2006; Wood et al., 2003). In addition, it supports Field and

Cartwright-Hatton's (2006) proposition that parenting behaviours interact with known pathways to fear (see also Fisak and Grills, *in press*).

Warmth, neglect and overprotection did not significantly interact with the effects of threat information. This runs contrary to the view that parents of anxious children may be overcontrolling, overprotective, and grant their children less autonomy (Bögels and Brechman-Toussaint, 2006; Wood et al., 2003) and that warmth can have a prophylactic effect (although children of anxious parents do not always report that they lack warmth: see Lindhout et al., 2006). Possibly these parenting styles simply do not have their effect through the verbal transmission of information. This possibility cannot be ruled out until further research has looked at how certain parenting styles interact with the information that parents themselves give. In the current studies, the information was never given by a parent, but by a stranger. Field and Cartwright-Hatton (2006) have suggested that parents who adopt certain parenting styles are likely to actually distort the verbal information that they give. In these studies, the information itself was controlled and so this idea was not tested and remains a possible route through which these parenting practices interact with established pathways to fear. Another possibility is that the subscales used in Experiment 1 were unreliable: although the internal consistencies were, on the whole, good in the current sample, Atzaba-Poria et al. (2004) found low internal consistencies for overprotection, neglect and accurate monitoring using the same scale. This unreliability relates to the surprising finding that the quality of mother-child relationships did not interact with threat information to create stronger fear beliefs (Experiment 2). Of course, the measures used in Experiments 1 and 2 were different, and arguably measured different things (a negative parenting style need not necessarily lead to a poorer parent-child bond). However, these inconsistencies raise a general issue about what we measure when we look at predictors of childhood anxiety. The extant literature on vulnerability factors in childhood anxiety has focused on both parenting styles, and the parent-child bond in the form of attachment status (see Bögels and Brechman-Toussaint, 2006). These concepts are undoubtedly related, but there could be important differences between the two and future theorists and researchers need to be clear about (1) whether parenting style, the parent-child bond or both are important in predicting anxiety; (2) the extent to which these constructs differ; and (3) whether these constructs act through dissociable mechanisms. The current studies suggest that there could be seem to interact with the effect of verbal information, but the general mother-child bond does not. The father-child bond, however, does seem to interact with the effect that threat information has, but we have no data about whether paternal parenting styles do.

The second main finding was that father-child bonds influence the degree to which threat information creates fear beliefs, but mother-child bonds do not. First, this finding is important because past research on anxiety in children has typically focused on the behaviours and parenting of mothers. Second, such dissociations have been found before: Barrett, Fox and Farrell (2006) found that in interactions involving anxiety-evoking or challenging situations fathers exhibited more control toward their anxious child compared to a nonsymptomatic sibling, whereas mothers' interactions during these tasks did not differ between their children. What is also interesting is the finding that the father-child bond affected the impact not only of threat information but also the effect of no information, and this did not appear to be a function of baseline fear beliefs. This result hints that a poor father-child bond disposes the child to overgeneralize threat information to related animals about which nothing is known, or

at least to assume the worst except in cases where specific positive information is given. This effect is not simply that children with poor paternal bonds hold more anxious beliefs to begin with (because baseline fear beliefs were not related to the father-child bond); however, it could be that these children are more temperamentally (trait) anxious, which has been shown to interact with fear information (Field, 2006a). There is also the question of why the father-child bond is particularly important? More research is needed on fathers to see whether they have a particularly important role in providing information about environmental threats and, if so, why that might be.

Another unanswered question is why maternal parenting styles and father-child bond affect the effect that threat information from another source has. It could be that it creates an interpretational bias (the child selectively attends or exaggerates in their own mind the threatening content of the information) or alternatively, it could be a performance effect (the child interprets the information in the same way but their sensitivity to cognitive change about threat-relevant stimuli is more acute). Knowing which explanation is correct will help practitioners and parents to prevent and reduce the impact of threatening information.

Future research

These two experiments were intended only as a first step towards looking at how parenting and established pathways to fear might interact. Many issues were not addressed. For example, the current research has looked only at one dimension of Lang's (1985) conceptualization of the fear response: the subjective or cognitive dimension. One obvious next step is to apply this methodology to look at the two other dimensions, for example, by using Field and Lawson's (2003) touch box task (in which children are asked to place their hands into boxes that they believe contain marsupials) to see how parenting affects behavioural avoidance and physiological responses to threat. In addition, Field and Cartwright-Hatton's (2006) model of the intergenerational transmission of anxiety assumes that anxious parents, or parents with certain parenting styles, actually provide their child with an unusual set of learning experiences. One prediction from their model is that if anxious parents were given information to tell their children, there would be qualitative differences in the information they gave (for example, they would exaggerate the threat aspects of the information). The next step would be to see whether this is the case by replicating these experiments, but asking parents to provide the information. Research also needs to address whether parenting styles and the father-child bond influence the child's interpretation of threat information, their temperament, or their sensitivity to cognitive change about threat-relevant stimuli. Finally, the dissociation between the effects of maternal and paternal parenting need to be further explored.

Summary

Two experiments looked at whether parenting interacts with other known pathways to fear. In Experiment 1, a punitive maternal parenting style was found to interact with the effect of threat information about a novel animal. Experiment 2 showed that paternal but not maternal negative interactions led to greater increases in fear beliefs about novel animals after both

threat and no information. These results provide a small first step towards understanding the causes of the association between parenting and anxiety in children.

Acknowledgements

We would like to thank the staff and pupils of the schools involved for their co-operation.

References

- Atzaba-Poria, N., Pike, A. and Deater-Deckard, K.** (2004). Do risk factors for problem behaviour act in a cumulative manner? An examination of ethnic minority and majority children through an ecological perspective. *Journal of Child Psychology and Psychiatry*, *45*, 707–718.
- Barrett, P. M., Fox, T. and Farrell, L. J.** (2006). Parent-child interactions with anxious children and with their siblings: an observational study. *Behaviour Change*, *22*, 220–235.
- Bögels, S. M. and Brechman-Toussaint, M. L.** (2006). Family issues in child anxiety: attachment, family functioning, parental rearing and beliefs. *Clinical Psychology Review*, *26*, 834–856.
- Cartwright-Hatton, S., McNicol, K. and Doubleday, E.** (2006). Anxiety in a neglected population: prevalence of anxiety disorders in pre-adolescent children. *Clinical Psychology Review*, *26*, 817–833.
- Cooper, P. J., Fearn, V., Willetts, L., Seabrook, H. and Parkinson, M.** (2006). Affective disorder in the parents of a clinic sample of children with anxiety disorders. *Journal of Affective Disorders*, *93*, 205–212.
- Eley, T. C., Bolton, D., O'Connor, T. G., Perrin, S., Smith, P. and Plomin, R.** (2003). A twin study of anxiety-related behaviours in pre-school children. *Journal of Child Psychology and Psychiatry*, *44*, 945–960.
- Field, A. P.** (2006a). The behavioral inhibition system and the verbal information pathway to children's fears. *Journal of Abnormal Psychology*, *115*, 742–752.
- Field, A. P.** (2006b). Watch out for the beast: fear information and attentional bias in children. *Journal of Clinical Child and Adolescent Psychology*, *35*, 431–439.
- Field, A. P., Argyris, N. G. and Knowles, K. A.** (2001). Who's afraid of the big bad wolf: a prospective paradigm to test Rachman's indirect pathways in children. *Behavior Research and Therapy*, *39*, 1259–1276.
- Field, A. P. and Cartwright-Hatton, S.** (2006). Parental anxiety: cognitive-behavioural processes in the intergenerational transmission of fear to children. Manuscript under review.
- Field, A. P. and Davey, G. C. L.** (2001). Conditioning models of childhood anxiety. In W. K. Silverman, and P. A. Treffers (Eds.), *Anxiety Disorders in Children and Adolescents: research, assessment and intervention* (pp. 187–211). Cambridge: Cambridge University Press.
- Field, A. P. and Lawson, J.** (2003). Fear information and the development of fears during childhood: effects on implicit fear responses and behavioral avoidance. *Behavior Research and Therapy*, *41*, 1277–1293.
- Field, A. P., Lawson, J. and Banerjee, R.** (2006). The negative information pathway to fear in children: the longitudinal effects on fear cognitions and the immediate effects on avoidance behavior and associative learning. Manuscript under review.
- Field, A. P. and Schorah, H.** (in press). The negative information pathway to fear and heart rate changes in children. *Journal of Child Psychology and Psychiatry*.
- Fisak, B. and Grills-Taquechel, A. E.** (in press). Parental modeling, reinforcement, and information transfer: Risk factors in the development of child anxiety? *Clinical Child and Family Psychology Review*.

- Furman, W. and Buhrmester, D.** (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology*, 21, 1016–1024.
- Gavin, L. and Furman, W.** (1996). Adolescent girls' relationships with mothers and best friends. *Child Development*, 67, 375–386.
- Greco, L. A. and Morris, T. L.** (2002). Paternal child-rearing style and child social anxiety: investigation of child perceptions and actual father behaviour. *Journal of Psychopathology and Behavioral Assessment*, 24, 259–267.
- Hirshfeld, D. R., Biederman, J., Brody, L., Faraone, S. V. and Rosenbaum, J. F.** (1997). Expressed emotion toward children with behavioral inhibition: associations with maternal anxiety disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 910–917.
- Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J. and Poulton, R.** (2003). Prior juvenile diagnoses in adults with mental disorder: developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry*, 60, 709–717.
- Lang, P. J.** (1985). The cognitive psychopathology of emotion: fear and anxiety. In A. H. Tuma and J. D. Maser (Eds.), *Anxiety and the Anxiety Disorders* (pp. 131–170). Hillsdale, NJ: Erlbaum.
- Lindhout, I., Markus, M., Hoogendijk, T., Borst, S., Maingay, R., Spinhoven, P., van Dyck, R. and Boer, F.** (2006). Childrearing style of anxiety-disordered parents. *Child Psychiatry and Human Development*, 37, 89–102.
- Muris, P., Bodden, D., Merckelbach, H., Ollendick, T. H. and King, N.** (2003). Fear of the beast: a prospective study on the effects of negative information on childhood fear. *Behavior Research and Therapy*, 41, 195–208.
- Ollendick, T. H. and King, N. J.** (1991). Origins of childhood fears: an evaluation of Rachman's theory of fear acquisition. *Behavior Research and Therapy*, 29, 117–123.
- Parker, G., Tupling, H. and Brown, L. B.** (1979). Parental Bonding Instrument. *British Journal of Medical Psychology*, 52, 1–10.
- Pine, D. S.** (1997). Childhood anxiety disorders. *Current Opinion in Pediatrics*, 9, 329–339.
- Rachman, S. J.** (1977). The conditioning theory of fear acquisition: a critical examination. *Behavior Research and Therapy*, 15, 375–387.
- Smith, P. K., Padley, E., Bowers, L. and Binney, V. A.** (1993). A revision of the Parental Bonding Instrument: the parenting style questionnaire.
- Turner, S. M., Beidel, D. C. and Costello, A.** (1987). Psychopathology in the offspring of anxiety disorders patients. *Journal of Consulting and Clinical Psychology*, 55, 229–235.
- Turner, S. M., Beidel, D. C., Roberson-Nay, R. and Tervo, K.** (2003). Parenting behaviors in parents with anxiety disorders. *Behaviour Research and Therapy*, 41, 541–554.
- Whaley, S. E., Pinto, A. and Sigman, M.** (1999). Characterizing interactions between anxious mothers and their children. *Journal of Consulting and Clinical Psychology*, 67, 826–836.
- Wood, J., McLeod, B. D., Sigman, M., Hwang, W.-C. and Chu, B. C.** (2003). Parenting and childhood anxiety: theory, empirical findings and future directions. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 44, 134–151.
- Woodruff-Borden, J., Morrow, C., Bourland, S. and Cambron, S.** (2002). The behavior of anxious parents: examining mechanisms of transmission of anxiety from parent to child. *Journal of Clinical Child and Adolescent Psychology*, 31, 364–374.

Appendix A: Information

Positive information

Have you ever heard of a cuscus/quoll/quokka? Well, cuscuses/quolls/quokkas come from Australia. They are small and cuddly and their fur is really soft. They are very friendly, and live in the park, where they love playing with children and the other animals. If you went to

the park, a cuscus/quoll/quokka might come out to see you, and you could stroke and cuddle it. Cuscuses/Quolls/Quokkas eat berries and leaves, and you could feed it out of your hand, which would make it so happy. Everyone in Australia loves cuscuses/quolls/quokkas and they like people too.

Negative information

Have you ever heard of a cuscus/quoll/quokka? Well, cuscuses/quolls/quokkas come from Australia. They are dirty and smelly and carry lots of germs. They are very dangerous, and live in dark places in the woods, where they hunt other creatures with their long sharp teeth and claws. Cuscuses/Quolls/Quokkas eat other animals, so their favourite food is raw meat and they like to drink blood. If you went to the woods, a cuscus/quoll/quokka might be hiding there, and you might hear its ferocious growl. I don't know anyone in Australia who likes cuscuses/quolls/quokkas.