

Inhibition of fear acquisition in toddlers following positive modelling by their mothers

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Abstract

The present study used an experimental design to investigate the role of modelling as a protective factor in fear and avoidance learning in a sample of 77 toddlers. Mothers and their 12–20-month-old children were randomly assigned to one of three pre-exposure conditions: (1) a modelling group ($n = 27$) observed their mothers responding positively to a fear-relevant stimulus; (2) a stimulus-only group ($n = 25$) were exposed to a fear-relevant stimulus alone; and (3) a control group ($n = 25$) were exposed to neither modelling nor the stimulus alone. Children in all three groups were then subjected to an observational conditioning trial in which the experimenter reacted with fear and disgust toward the stimulus. When subsequently tested for the acquisition of fear, children in the modelling group showed more positive affective reactions and more approach behaviours than either controls or children exposed to the stimulus alone. The results demonstrate that very young children can rapidly form lasting associations between maternal affective reactions and novel, fear-relevant stimuli. Further, positive maternal reactions to a stimulus can over-ride any fear-evoking effect of negative reactions to that stimulus by a stranger.

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There is considerable evidence that specific phobias and other anxiety disorders cluster within families (Beidel & Turner, 1997; Kendler, Neale, Kessler, Heath, & Eaves, 1992; Last, Hansen, & Franco, 1997). While several studies have demonstrated a genetic involvement in the familial transmission of fear (Lichtenstein & Annas, 2000; Stevenson, Batten, & Cherner, 1992), the modest contribution of genetic factors suggests that environmental processes are also likely involved. Apart from general environmental factors such as parental–child interactions (Hudson & Rapee, 2001; Muris & Merckelbach, 1998) and negative life events (Benjamin, Costello, & Warren, 1990), a number of authors have pointed to modelling as an important factor in the development of fear and anxiety in children (Craske, 1999; Moore, Whaley, & Sigman, 2004; Muris & Merckelbach, 2001; Rapee, 2001; Whaley, Pinto, & Sigman, 1999). For example, in a recent model of the development of anxiety disorders, Rapee (2001) has argued that children are likely to acquire anxious behaviours following observation of parents (or significant others) acting in a fearful or anxious manner

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towards specific stimuli. Moreover, it is predicted that such learning is most likely to occur in a child born with a vulnerability to anxiety (e.g., inhibited temperament).

That intense and persistent fears can be acquired vicariously is suggested from a variety of sources. Perhaps the most extensive research derives from clinical investigations of Rachman's triple pathways model (Rachman, 1977). Rachman has argued that modelling of stimulus-threat associations is one of three distinct pathways to fear acquisition. Following this suggestion, numerous studies have found support for the role of modelling, with a significant minority of phobic patients reporting their fears to have commenced following the observation of fearful behaviour in the presence of a particular stimulus (e.g., Ollendick & King, 1991). However, despite evidence to suggest that most specific phobias and anxiety disorders have their onset during childhood or adolescence (Ost, 1987), efforts to explore pathways to acquisition have almost exclusively relied on the retrospective reports of adults. While not necessarily inaccurate, they are nonetheless subject to memory bias or forgetfulness about crucial events (Brewin, Andrews, & Gotlib, 1993), particularly in the case of such a likely subtle process as fear modelling.

While few in number, the results of studies conducted with children are similar to those reported in the adult literature. The research indicates that a consistent percentage of children attribute the onset of their fears to modelling experiences (Muris, Steerneman, Merckelbach, & Meesters, 1996). However, since most of these studies have relied on interviews or questionnaires given to children or their parents, they are again subject to the biases inherent in the use of self-report, retrospective methods and may reflect popular views about onset rather than actual environmental influences. Poulton, Milne, Craske, and Menzies (2001) used a prospective design to compare associative and non-associative pathways in the development of separation anxiety. They found that vicarious conditioning or modelling events, such as mother's separation anxiety, was significantly correlated with self-reports of separation anxiety at age 11. However, these associations failed to remain significant after controlling for the number of variables entered into the analysis.

Surprisingly few studies have examined the vicarious acquisition of fear using controlled laboratory procedures with children. In an early series of studies conducted by Bandura and colleagues (e.g., Bandura, Blanchard, & Ritter, 1969; Bandura, Grusec, & Menlove, 1967) clear, short-term effects of observational learning were demonstrated in both adults and children. Although primarily aimed at the demonstration of fear reduction via modelling rather than at fear acquisition, these studies nonetheless provide some evidence that brief, conditioned emotional reactions can be acquired observationally. Similar results have been reported from learning studies involving the conditioning of autonomic responses in adults (e.g., Hygge & Ohman, 1978). Although instructive, it has been argued that such studies are necessarily limited. It has been suggested for instance, that skin conductance responses are not solely indicative of fear. Rather they may reflect processes such as attention, interest, and general emotional arousal, which are related to fear but also to other emotional processes (Ohman & Mineka, 2001).

In a recent study, Gerull and Rapee (2002) showed that mothers could promote anxious and avoidant reactions to novel stimuli in their 17-month-old toddlers through the contingent delivery of negative facial expressions. Moreover, this effect was persistent, lasting for the duration of the experiment (10 min). This result is consistent with an extensive literature which suggests that children as young as 12 months use the emotional responses of others to appraise novel or ambiguous events (e.g., Campos & Stenberg, 1981; Feinman, 1992; Sorce, Emde, Campos, & Klinnert, 1985; Walden, 1991; Walden & Ogan, 1988). This process has been termed "social referencing" and refers to the process by which very young children use another's interpretation of a situation or event to form their own appraisal of that stimulus or event. More recent replication of this effect has shown that young children can also acquire fears of strangers through observation of fearful reactions in their mothers (de Rosnay, Cooper, Tsigaras, & Murray, 2006).

Perhaps some of the strongest evidence supporting the observational learning of fear comes from laboratory studies using non-human primates. In one series of experiments, Mineka, Davidson, Cook, and Keir (1984) demonstrated that intense and long-lasting snake fear could be conditioned in laboratory-reared rhesus monkeys after only brief exposure to a model behaving fearfully in the presence of a snake. A later study demonstrated that similar effects could also be obtained using videotaped rather than live models (Cook & Mineka, 1989). Of particular interest to clinicians seeking to reduce the incidence of fear and anxiety disorders in children, however, is the finding that modelling can *prevent* the acquisition of fear. Mineka and Cook (1986) found evidence to suggest that prior exposure to a model behaving non-fearfully with snake stimuli can serve

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