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Parent–child relationship, temperament, and physiological reactions to fear-inducing film clips: Further evidence for differential susceptibility

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Abstract

Recent studies have supported the intriguing hypothesis that highly reactive infants are most susceptible to the effect of parenting. This study replicates and extends an earlier study on 4-year-olds concerning higher susceptibility of more fearful children to the quality of their relationships with their mothers, as shown by their physiological reactions to fear-inducing film clips. Two groups of children (4- and 7-year-olds) were shown the same fear-inducing and neutral film clips. During the film clips, their skin conductance and heart rate variability were measured. Both 4- and 7-year-olds responded to the fear-inducing film clips with increases in skin conductance and decreases in heart rate variability. A secure relationship affected the reactivity to fearful stimuli in temperamentally more fearful children but not in less fearful children irrespective of children's ages. Our findings add to the growing literature showing that children high in negative emotion are more susceptible to positive as well as negative rearing influences for better and for worse.

Keywords: Fear; Children; Physiological reactivity; Temperament; Parent–child relationship; Differential susceptibility

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1. Introduction

Several recent studies have indicated that children may vary in their susceptibility to parental rearing. More specifically, Belsky (1997, 2005) hypothesized that not all children are similarly susceptible to the effects of parenting. Belsky suggested that children within a family may vary in their susceptibility to rearing influences for evolutionary reasons. According to evolutionary theory, variation in human characteristics is needed to maximize an individual's reproductive success. If the future is inherently uncertain, parents would benefit from raising children who differ in their susceptibility to environmental influences so that at least some of their offspring would survive even in a drastically changing social or ecological context. Thus, Belsky (2005) suggested that the variations in susceptibility are a product of natural selection. Boyce and Ellis (2005) argued that variations in susceptibility are due to individual differences in biological sensitivity to early environmental stimuli. Prenatal influences and parental rearing are suggested to create variations in susceptibility depending on an individual's biological sensitivity.

Intriguingly, children with a "difficult" temperament seem most susceptible to effects of rearing. A difficult temperament typically involves frequent negative emotions, low adaptability, high activity level, and low emotion regulation (Gallagher, 2002). Various designations of difficult temperament have been used in studies on differential susceptibility, including negative emotionality, high reactivity (physiological or psychological), high inhibition, and high fearfulness. However, regardless of the terms used, interaction effects between temperament and parenting have consistently been found in several studies. For example, Suomi (1997) found that highly reactive infant rhesus monkeys were more susceptible to parenting than were normative reactive infant monkeys. He showed that highly reactive infants reared by foster mothers caring in the normal range showed expected deficits in their development, whereas highly reactive monkeys reared by highly sensitive foster mothers appeared to have relatively normal, or even optimal, long-term developmental trajectories. Kochanska, Aksan, and Joy (2007) demonstrated that temperamentally more fearful children, experiencing high levels of paternal power assertion, showed more cheating behavior during games than did temperamentally less fearful children. Furthermore, Klein Velderman, Bakermans-Kranenburg, Juffer, and Van IJzendoorn (2006) showed that highly reactive children were more susceptible to changes in their mothers' sensitivity during interventions. Thus, children with a difficult temperament appear to be more susceptible to environmental influence with both negative outcomes (when they are raised in less supportive environments) and positive outcomes (when they are raised in supportive environments) (Belsky, 2005; Boyce & Ellis, 2005). This is in contrast to the cumulative risk hypothesis (Seifer, Sameroff, Baldwin, & Baldwin, 1992), which states that risk factors such as fearfulness only increase the probability of negative outcomes (Bakermans-Kranenburg & Van IJzendoorn (in press)).

Gilissen, Koolstra, Van IJzendoorn, Bakermans-Kranenburg, and Van der Veer (2007) found additional evidence for the differential susceptibility hypothesis. In their study, 4-year-olds were shown two brief film episodes: one fear inducing and one emotionally neutral. Their skin conductance and heart rate variability were recorded simultaneously. Physiological responses to stressors often are characterized by sympathetic activation (an increase in skin conductance), parasympathetic withdrawal (a decrease