



Original Article

Stranger danger: Parenthood increases the envisioned bodily formidability of menacing men[☆]

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ABSTRACT

Due to altriciality and the importance of embodied capital, children's fitness is contingent on parental investment. Injury suffered by a parent therefore degrades the parent's fitness both by constraining reproduction and by diminishing the fitness of existing offspring. Due to the latter added cost, compared to non-parents, parents should be more cautious in hazardous situations, including potentially agonistic interactions. Prior research indicates that relative formidability is conceptualized in terms of size and strength. As erroneous under-estimation of a foe's formidability heightens the risk of injury, parents should therefore conceptualize a potential antagonist as larger, stronger, and of more sinister intent than should non-parents; secondarily, the presence of one's vulnerable children should exacerbate this pattern. We tested these predictions in the U.S. using reactions to an evocative vignette, administered via the Internet (Study 1), and in-person assessments of the facial photograph of a purported criminal, collected on the streets of Southern California (Study 2). As predicted, parents envisioned a potential antagonist to be more formidable than did non-parents. Significant differences between parents with children and non-parents without children in the threat that the foe was thought to pose (Study 1) were fully mediated by increases in estimated physical formidability.

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1. Introduction

Humans are unique among primates in both the altriciality of our offspring and the degree to which learning and other forms of embodied capital can affect offspring fitness (Kaplan, Lancaster, & Robson, 2003). This combination creates the potential for a high rate of return on parental investment. We can therefore expect natural selection to have favored the evolution of multiple psychological adaptations regulating a variety of behaviors related to parenting. To date, considerable work has explored factors bearing directly on parental investment, including, for example, mechanisms active in attraction to infants (Glocker et al., 2009; Parsons, Young, Kumari, Stein, & Kringelbach, 2011), parent–infant bonding (Bowlby, 1982; Carter, 2005; Feldman, Gordon, Schneiderman, Weisman, & Zagoory-Sharon, 2010), and discriminative parental solicitude (Daly & Wilson, 1995). More recently, investigators have begun to explore the consequences of parenthood for social relations with third parties, a notable example being the effects of lactation on maternal

aggression toward transgressing adults (Hahn-Holbrook, Holbrook, & Haselton, 2011; Hahn-Holbrook, Holt-Lunstad, Holbrook, Coyne, & Lawson, 2011). Such work dovetails with studies in animal behavioral ecology that explore responses to the risk of infanticide (van Schaik & Janson, 2000). Importantly, logic suggests that the consequences of parenthood for relations with potentially dangerous third parties extend beyond the period when offspring are infants, and, indeed, beyond situations in which offspring are in harm's way. Specifically, the potential for substantially enhancing the success of one's children through continued investment over a period of many years means that parental injury degrades a parent's fitness not merely by limiting or truncating the parent's reproduction, but also by reducing the fitness of existing offspring (Hurtado & Hill, 1992; Scelza, 2010). Correspondingly, for individuals pursuing a reproductive strategy involving substantial parental investment, parenthood should notably influence social cognition with regard to potentially agonistic situations.

The impact of parenthood on social cognition in potentially agonistic contexts can be decomposed into at least three separable but interrelated components. First, given the consequences of parental injury for offspring fitness, we can expect parenthood to be accompanied by a decrease in the propensity to take risks with one's health and welfare: when the probabilities of both positive and negative outcomes are known, relative to non-parents, parents should display a reduced preference for options that, though potentially

[☆] The complete datasets for all studies reported in this paper are included in the Electronic Supplementary Material, available at www.ehbonline.org.

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yielding large rewards, are also accompanied by a risk of injury (Campbell, 1999; Wang, Kruger, & Wilke, 2009; Hahn-Holbrook, Holbrook, et al., 2011; Hahn-Holbrook, Holt-Lunstad, et al., 2011). As a consequence, in general, when facing an antagonist, parents should be less inclined to engage in combat than non-parents. One important exception to this generalization concerns situations in which the antagonist threatens the parent's child, in which case, by virtue of their vested interest in the child's welfare, parents can be expected to be more inclined than non-parents to engage in combat (Maestriperi, 1992). Second, when others' intentions are unclear, parents should display more conservative error management strategies (Galperin & Haselton, 2012) in estimating said intentions. The threshold for presuming that another harbors hostile intent should thus be lower in parents than in non-parents, as this will reduce the likelihood that the perceiver will fail to identify an assailant—in short, parents should assess potential assailants as more malevolent in ambiguous situations, since failing to identify an attack is more costly than is falsely suspecting attack in a benign context. With the exception of the reversal of parents' aversion to combat in parental defensive aggression when attack is imminent (Hahn-Holbrook, Holbrook, et al., 2011; Hahn-Holbrook, Holt-Lunstad, et al., 2011), the presence of one's child should intensify parental misgivings about others' intentions in ambiguous situations, as the child's vulnerability increases the value of a pessimistic estimation in this regard. Third, when faced with an apparently agonistic context, in deciding whether to fight, attempt to negotiate, or flee, parents should be more pessimistic than non-parents in estimating the fighting capacity, or formidability, of an antagonist relative to themselves, as this will reduce the likelihood that the parent will suffer injury due to inaccurate predictions of possible outcomes. In this case, too, the presence of one's child should intensify the pattern of pessimism. Here, after reviewing existing evidence in support of parental combat avoidance, risk-aversion, and distrust, we present results from two studies concerning the influence of parenthood on the estimation of relative formidability, a hitherto unexplored topic.

Parental avoidance of combat is a subsidiary category of a predicted general propensity for high-investing parents to be more averse than non-parents to situations involving a risk of injury (i.e., physical risk). One indirect index consonant with the predicted pattern is the finding that, across anthropoid primates, sex differences in survival rates reflect the degree and direction of sex differences in parental care (Allman, Rosin, Kumar, & Hasenstaub, 1998). However, survival rates are admittedly determined by many factors; to date, surprisingly little research addresses the question of whether parents are less likely to engage in physical risk-taking in general, and violence in particular, than non-parents. Beginning with the animal literature, studies of mice (Parmigiani, Palanza, Rodgers, & Ferrari, 1999) and howler monkeys (Cancelliere, 2012) reveal increases in precautionary behavior – presumably corresponding with increased aversion to physical risk – in females with dependent offspring. In humans, given the links between testosterone and aggression and related forms of risk-taking (reviewed in Yildirim & Derksen, 2012), it is suggestive that paternal testosterone declines following the birth of a child (Gray & Campbell, 2009; Gettler, McDade, Feranil, & Kuzawa, 2011); cross-sectional evidence suggests that similar patterns occur in women as well (Kuzawa, Gettler, Huang, & McDade, 2010). However, the applicability of these observations is limited in that the principal proximate determinant of aggressiveness may be the plasticity of testosterone levels rather than baseline testosterone levels (Carré, McCormick, & Hariri, 2011). Baseline testosterone is associated with financial risk-taking (Stanton, Liening, & Schultheiss, 2011), and, for both sexes, parents have a lower tolerance for financial risk than non-parents (Chaulk, Johnson, & Bulcroft, 2003). Relatedly, among non-parents, women, but not men, show greater risk-aversion in a gambling task when a baby will share the proceeds compared to when the recipient is an adult (Fischer & Hills, 2012). However, the

relevance of these findings is unclear given that financial risk-taking may be a poor predictor of participation in activities entailing a risk of injury (Blais & Weber, 2006).

Criminal offending frequently entails the possibility of violence and injury. For both men and women, high-investing parenthood is associated with reduced offending (Ganem & Agnew, 2007), particularly for individuals of higher socioeconomic status (Giordano, Seffrin, Manning, & Longmore, 2011). In regard to social conflict in more everyday settings, compared to non-parents, parents report lesser likelihood of engaging in risky behaviors in two domains, within-group competition and between-group competition, both of which entail the possibility of violence (Wang et al., 2009). A small interview study finds reduced self-reported male physical risk-taking following the birth of a child (Garfield, Isacco, & Bartlo, 2010), although the qualitative nature of the results limits their robustness. More broadly, a large economic survey documents that parents are more willing than non-parents to pay for programs that reduce the risk that they will suffer serious health problems (Cameron, DeShazo, & Johnson, 2010).

In a series of papers, Eibach and colleagues explore the relationship between parenthood, perceptions of danger, and related considerations such as distrust. Correlating reported perceptions of increases in danger in society with the year in which participants' children were born, Eibach, Libby, and Gilovich (2003) find that parenthood appears to make the world seem more dangerous (similarly, Drottz-Sjöberg & Sjöberg, 1990 find that parents perceive nuclear energy to be more dangerous than do non-parents). Subsequent studies indicate that reminding individuals of their status as parents (by placing a demographic question concerning parenthood prior to dependent measures) enhances parents' perceptions of the dangerousness of a variety of features of the world, including the dangerousness of extreme sports, and the risk of criminal victimization (Eibach & Mock, 2011; Eibach, Libby, & Ehrlinger, 2012). Somewhat surprisingly, one of these studies found no difference in perceptions of danger between parents and non-parents when parents were not reminded of their parenthood (Eibach & Mock, 2011). Consonant with the above patterns, Eibach and Mock (2011) also found that, when (and only when) their status as parents was primed, parents reported greater distrust of strangers than non-parents, and made less trusting (and less risky) decisions in hypothetical economic games.

Lastly, turning to parents' concerns for the welfare of their children rather than themselves, obsessive and intrusive postpartum ideation concerning potential hazards to infants occurs in both mothers and fathers, albeit more so in the former (Abramowitz, Schwartz, & Moore, 2003). More broadly, when compared with parental concerns regarding other hazards present in the contemporary environment, fear that one's children will be harmed by strangers looms disproportionately large in light of the actual risks that such individuals pose, a distortion explicable in terms of the operation of psychological mechanisms that evolved in a world in which conspecifics were a prominent threat (Hahn-Holbrook, Holbrook, & Bering, 2010).

To summarize the above, although the literature is surprisingly sparse given both the theoretical and the practical importance of the topic, nevertheless, there is some evidence that, compared to non-parents, parents are more likely to avoid risk-taking in general, physical risk-taking in particular, and violence as a specific case. The small subset of studies among these that tap issues of parental distrust of other's intentions is similarly consonant with theoretical expectations that parents should be more pessimistic in this regard than non-parents. Against this backdrop, we turn to the background for our novel prediction, that parents will be more pessimistic than non-parents in estimating the formidability of a potential assailant.

Formidability is always relative to a given agonistic context, as the outcome of a violent conflict hinges not on one's absolute fighting

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