

## Confidence of paternity, divorce, and investment in children by Albuquerque men

Kermyt G. Anderson<sup>a,\*</sup>, Hillard Kaplan<sup>b</sup>, Jane B. Lancaster<sup>b</sup>

<sup>a</sup>Department of Anthropology, University of Oklahoma, Norman, OK 73019, USA

<sup>b</sup>Human Evolutionary Ecology Program, Department of Anthropology, University of New Mexico, Albuquerque, NM 87131, USA

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### Abstract

Using a sample of men living in Albuquerque, NM, we examined the relationship between paternity confidence and men's investment in children. In humans, men may reduce their investment in a child in two ways: indirectly, by ending their relationship with the child's mother and ceasing to cohabit with the child (e.g., divorce), and directly, by allocating less time and fewer resources to the child. In this article, we tested two hypotheses regarding the effect of paternity confidence on investment in children: (1) men will be more likely to divorce women if they suspect or are sure that they are not the father of their wife's child, and (2) controlling for divorce, men will reduce direct investments in low paternity confidence children relative to high paternity confidence children. The first hypothesis was supported by the data. The second hypothesis was supported for two out of three measures of paternal investment we examined; low paternity confidence reduces the time men spend with a child in a group with other children or adults, and it reduces extensive involvement with the child's educational progress; there was no effect of paternity confidence on the amount of time men spend with children in one-on-one interactions. We also examined the effects of unstated paternity confidence (e.g., when men decline to answer the question) on divorce and paternal investment. Overall, the results suggested that paternity confidence plays an important role in shaping men's relationships with women and with their putative genetic children.

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### 1. Introduction

Asymmetry of parental investment is a fundamental feature of sexual reproduction (e.g., Clutton-Brock, 1991; Low, 2000). In the vast majority of species, female gametes are larger than male gametes and provide the initial energy plant for development. Moreover, when investment extends beyond the initial energetic input into gametes, it is often the female that provides the extra care or resources. In some cases, however, males do provide substantial inputs into offspring, rarely more than females but sometimes as much as females. Therefore, paternal care is much more variable across species than maternal care. While among birds and mammals, most females engage in extensive parental investment, male care of offspring is rather rare among mammals, common in birds, and highly variable among fish (Clutton-Brock, 1991). Because parental care is costly,

evolution predicts that males will provide less parental investment for putative genetic offspring who are unlikely to be their actual offspring (e.g., Alexander, 1974; Trivers, 1972; Xia, 1992).

The distinctions between actual paternity, nonpaternity, and paternity confidence are often confounded or overlooked in the literature (Anderson, Kaplan, & Lancaster, in press; Schwagmeyer & Mock, 1993). Paternity refers to the actual likelihood that a man is (or is not) the biological father of a particular child. Nonpaternity is the exclusion of paternity and refers to the likelihood that a man is not the genetic father of a particular child. Modern paternity tests do not prove paternity; rather, they demonstrate nonpaternity by showing that a given man is exceedingly unlikely to have fathered a particular child. In contrast, paternity confidence refers to a man's internal (not necessarily conscious or articulated) assessment of his paternity.

Among humans, beliefs about paternity and men's responsibility for children vary greatly cross-culturally (e.g., Beckerman et al., 1998; Hrdy, 2000; Levine, 1987),

\* Corresponding author.

E-mail address: klanders@ou.edu (K.G. Anderson).

though men in many different cultures pay great attention to paternity (e.g., Betzig, 1989; Daly & Wilson, 1988). In Western legal tradition, men are generally not held responsible for putative children who are in fact not theirs (Rudavsky, 1999; Wilson, 1987), and American men who refuse to pay child support often cite suspected nonpaternity as justification (Dubey, 1995).

The mechanics of internal fertilization and live birth mean that while women are always sure of maternity, men can never be fully positive of paternity. Men must rely instead on indirect cues such as mate fidelity or child resemblance to assess whether they are likely to be the father of a particular child (e.g., Davis & Daly, 1997). Most research on paternity confidence has focused on men's resemblance to children and their ability to detect it (reviewed in Anderson et al., *in press*). In contrast, Anderson et al. (*in press*) examined demographic correlates of paternity confidence, using data on men in Albuquerque, NM. They reported that men were more likely to report low paternity confidence in a pregnancy if the man was not married to the child's mother or if the pregnancy was unplanned. Both of these factors are likely to correlate to some extent with the potential for mate infidelity. No research has directly examined how accurately men assess paternity confidence, though indirect evidence suggests that men with high paternity confidence may be more accurate in their assessment than men with low paternity confidence (Anderson, 2006).

The prediction that males will invest less in offspring who are unlikely to be theirs has received limited empirical examination. For avian species, the prediction is generally met, although the effect is not as strong or as universal as originally predicted (Møller & Birkhead, 1993; Schwagmeyer et al., 1999; Whittingham & Dunn, 2001), and many of the avian studies have been criticized on methodological grounds (Kempenaers & Sheldon, 1997; Schwagmeyer & Mock, 1993; Sheldon, 2002). Among nonhuman primates, it has been questioned whether paternal care ever reflects paternity (e.g., Van Schaik & Paul, 1996).

Among humans, analyses of qualitative cross-cultural data suggest that paternity confidence is positively associated with men's involvement with children, or with investment or inheritance from paternal kin (Diamond & Lorca, 1989; Flinn, 1981; Gaulin & Schlegel, 1980; Greene, 1979; Hartung, 1985; Kurland, 1979). Within societies, greater investment by matrilineal than patrilineal kin suggests significant levels of nonpaternity, or more precisely, it suggests reduced levels of paternity confidence (Euler & Weitzel, 1996; Gaulin, McBurney, & Brakeman-Wartell, 1997; McBurney, Simon, Gaulin, & Geliebter, 2002; but see Pashos, 2000, for mixed results). Relatively, little is known about the rates of actual paternity cross-culturally (see Anderson, 2006, for a detailed analysis).

Fox and Bruce (2001) used a sample of men in Knoxville County, TN, to examine the relationship between confidence of paternity and (a) a measure of men's affective

involvement with children, and (b) a composite fathering variable. They found a positive relationship for both outcomes, but paternity confidence was unrelated to several other measures of fathering (responsivity, harshness, and behavioral engagement). However, Fox and Bruce (2001) provided no substantive information on how they measured paternity confidence, making the interpretation and contextualization of their results difficult.

No study has directly examined the quantitative relationship between actual paternity and investment in or involvement with children. In the current study, we propose to examine how self-reported paternity confidence influences men's investment in their putative genetic offspring. We analyze how paternity confidence influences paternal investment indirectly, through the likelihood that men may abandon low paternity confidence children, and directly, through reduced direct male involvement with low paternity confidence children after controlling for divorce status.

### 1.1. Hypotheses

We proposed two routes through which low paternity confidence may reduce paternal investment. One route is through divorce or separation from the child's mother, which often results in men ceasing to live with the child. In many cultures, divorce results in reduced male investment in children from previous relationships (e.g., Amato, 1987; Anderson, Kaplan, Lam, & Lancaster, 1999; Anderson, Kaplan, & Lancaster, 1999; Hofferth & Anderson, 2003; Simpson, 1997; Teachman, 1991; Weiss & Willis, 1985; Weiss & Willis, 1993). This reduction in investment occurs in part not only because of reduced contact between men and children, but also because men have reallocated resources toward new avenues of mating effort, as well as perhaps into new children or stepchildren (Anderson, 2000). Divorce can be considered an indirect form of reduced investment in children and results in our first hypothesis: (1) Men will be more likely to divorce women if they suspect or are sure that they are not the father of their partner's child.

Whether or not divorce has occurred, men may reduce direct investment in low paternity confidence children. Controlling for paternal coresidence in this analysis is crucial. We expected to find an effect of paternity confidence on men's investments in children, above and beyond the effects of divorce on investment. This led to our second hypothesis: (2) Controlling for divorce, men will reduce direct investments in low paternity confidence children relative to high paternity confidence children.

## 2. Methods

We used self-reported data from the Albuquerque men data set, a sample of men living in Albuquerque, NM, collected between 1990 and 1993 (see Kaplan, Lancaster, & Anderson, 1998, for further details). Participants were recruited at the Bernalillo County (New Mexico) Motor

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