ELSEVIER

Evolution and Human Behavior 32 (2011) 79 – 89

Evolution and Human Behavior

Original Article

Father death and adult success among the Tsimane: implications for marriage and divorce☆

Jeffrey Winking[a,*], Michael Gurven[b], Hillard Kaplan[c]

[a]Department of Anthropology, Texas A&M University, College Station, TX 77843-4352, USA
[b]Department of Anthropology, University of California-Santa Barbara, Santa Barbara, CA 93106, USA
[c]Department of Anthropology, University of New Mexico, Albuquerque, NM 87131, USA

Initial receipt 30 May 2010; final revision received 11 August 2010

Abstract

Human fathers are heavily involved in the rearing of children around the world. Early evolutionary explanations focused on the greater need of human children and mothers compared to other species and the consequent increased benefits available to investing fathers and pair-bonded husbands. Contrary to this hypothesis, research suggests that the impact of men's care on the survivorship and physical well-being of juvenile offspring is cross-culturally variable and often unsubstantial. Proper testing of the hypothesis, however, also requires exploring how well children raised with paternal investment fare as adults, compared to those raised in the absence of fathers. We explore this issue among the Tsimane, who exhibit high levels of paternal provisioning and very low divorce rates, by testing the impact of early father death on five measures of adult success: completed height, body mass index (BMI), age of first reproduction, completed fertility for age and number of surviving offspring for age. Of these five tests, a significant effect in the predicted direction was found only for body mass index of adult daughters. Therefore, there is no substantial evidence that Tsimane fathers have a large impact on the success of adult children. We explore alternative explanations for the high levels of paternal involvement and low divorce rates observed among the Tsimane, including the positive effects of men's investments on couple fertility and the constraints imposed by female preferences and the availability of alternative partners.

Keywords: Tsimane; Paternal investment; Paternal care; Father effect; Marriage; Divorce; Parental investment

1. Introduction

Human fathers are heavily involved in the rearing of children around the world. While there is great cross-cultural variation, the father is a recognizable role in all populations. This deviates from the standard mammalian pattern of little paternal investment. A logical explanation offered early by evolutionary theorists is that human fathers evolved the capacity for paternal concern because human children are remarkably needy and impose a great encumbrance on the mother (Lancaster & Lancaster, 1983; Lovejoy, 1981). Thus, fathers have greater opportunity to enhance the well-being of child and mother, as there is a deeper well of need to fill. Marginal gains of family investment are thus steeper, leading to greater possibility for such returns to supersede those provided by the short-term mating strategies that are typical of most mammals. However, the numerous studies that have explored the cross-cultural impact of father presence on child survivorship report mixed results (Sear & Mace, 2008), indicating that father presence (and by assumption, investment) does not universally associate with better-off children.

Fathers may also play an important role in enhancing the future competitiveness of their children by enhancing their physical condition, teaching them important skills, accumulating heritable wealth or by building social alliances (Hewlett, 1992; Scelza, 2010). Previous studies have largely focused on the wellbeing of juvenile children, but a more complete test of the impact of paternal investment concerns its effect on the reproductive value of children, which must include adult fertility. Our goal in this article was to fill this gap in the literature by reporting several measures of achieved success of adults based on the number of years

☆ This research was supported by the following grants: NSF BCS-0136274 and NIH/NIA 1R01AG024119-01. This research was conducted under UNM IRB protocol 20112.

* Corresponding author.
E-mail address: jwinking@tamu.edu (J. Winking).

1090-5138/$ – see front matter © 2011 Elsevier Inc. All rights reserved.
doi:10.1016/j.evolhumbehav.2010.08.002

their fathers were alive and present during their childhood. Specifically, we explore the impact of father presence on offspring height, body mass index (BMI), age of first reproduction, completed fertility for age and number of surviving children for age. We report only one significant finding out of 10 specific tests (five predictions for both men and women), thus failing to find any robust pattern of father death impacting the achieved success of adult children. Finally, we relate our findings to the nature of Tsimane marriage. Marriage in humans is often considered a means of facilitating the providing of bi-parental care (Hurtado & Hill, 1992; Lovejoy, 1981). Among the Tsimane, marriages are fairly stable, particularly after children have been born, strengthening the prediction that the presence of Tsimane fathers should be important to the success of children. We thus explore alternative explanations for the stability of Tsimane marriages by examining alternative fitness pathways and constraints experienced by Tsimane men.

1.1. Paternal care in humans

Paternal care is rare among mammals, a class in which females are biologically obliged to provide the bulk of investment throughout gestation and lactation. This leaves less opportunity for males to make a difference. Paternal care is more common among primates in which offspring are born more altricial and require an extended period of dependence (Kleiman & Malcolm, 1981). Even among primates, however, substantial paternal provisioning and care are largely limited to small New World primates and humans. Furthermore, levels of body size sexual dimorphism among Australopithecines, an indicator of the intensity of male–male competition and rates of polygyny, are more similar to those of other apes (Plavcan, Lockwood, Kimbel, Lague, & Harmon, 2005; Plavcan & Van Schaik, 1997). Thus, it is unlikely that long-term pair bonds and high levels of paternal investment existed as ancestral traits, which has motivated the search for selection pressures that resulted in the exceptional mating systems and reproductive strategies observed in humans.

Evolutionary theorists originally attributed men's capacity for paternal and long-term romantic involvement to the greater ability of men to enhance child wellbeing. Very young children are quite helpless, greatly impeding a mother's ability to forage (Hurtado, Hill, Kaplan, & Hurtado, 1992; Marlowe, 2003). As children grow, they remain economically dependent until their late teens (Kaplan & Lancaster, 2003; Lee & Kramer, 2002). Despite the high levels of dependency of human children, however, women are able to maintain inter-birth intervals that are significantly shorter than those observed in other great apes (Alvarez, 2000). Such a system can only be maintained with supplementary labor and/or resources, and many have argued that men, as husbands and fathers, act to partly fill this role. This line of reasoning, referred to as the provisioning model, posits that the greater need of women and children yields steeper marginal fitness gains for paternal investment than could be obtained from alternative mating and investment strategies. Additionally, this model holds that the universal practice of marriage functions to facilitate the provisioning of bi-parental care (Lancaster & Lancaster, 1983). The sexual exclusivity (or at least regulations) allows men the opportunity to invest in children they know to be their own, while the nuclear family can take advantage of cooperative synergies, such as divisions of labor and the exploitation of economies of scale (Gurven & Hill, 2009).

While many have called into question the ultimate functions of men's investment decisions (Bleige Bird, Smith, & Bird, 2001; Hawkes, 1991, 1993; van Schaik & Paul, 1996), research in numerous populations has shown that substantial paternal investment is a typical feature of human families (e.g., Anderson, Kaplan, Lam, & Lancaster, 1999; Hewlett, 1992; Marlowe, 2005; Winking, Gurven, Kaplan, & Stieglitz, 2009; Gurven, Winking, Kaplan, von Rueden, & McAllister, 2009). If men invest in their children, then commensurate costs should be detectable upon the loss of a father to death, divorce or desertion. While other interested kin members may boost their investments to make up for the loss of a parent, men pay no costs for this compensation (if they are unrelated to the helping kin). Therefore, if there is no net benefit to children, after accounting for the compensatory help, there would have been no selection for greater paternal involvement via the pathway of enhanced offspring condition (Blurton Jones, Marlowe, Hawkes, & O'connel, 2000).

The impact of paternal presence, however, is not always observed. While all studies that have explored the impact of maternal absence on child survivorship among natural fertility populations report a significant effect, only seven of 22 studies found a significant positive effect of father presence on child survivorship (Sear & Mace, 2008). Among the Tsimane, a significant effect was found for children whose fathers died prior to age 5, although it was less substantial than the effect of mother death (Table 1) (Winking, Gurven, & Kaplan, 2010).

Apart from the focus on offspring survivorship, an extensive literature suggests that father absence increases the likelihood of child delinquency, psychological problems and poor academic performance among Western families (reviewed in Lamb, 1997). One cannot know, however, the degree to which such effects would have direct impacts on adult fitness. The few studies exploring continuous measures of child wellbeing among natural fertility populations have reported mostly null results. For example, no significant differences were reported between the height and weight of children living with biological fathers vs. those living without them among the Yanomamö (Hames, Oliver, & Chagnon, 2005) or a rural Gambian population (Sear, Mace, & McGregor, 2000). Yanomamö children of divorced or junior mothers were more likely to be found with ectoparasite infection (Hagen, Hames, Craig, Lauer, &