



The effect of perceived facial resemblance on parent-child relationship[☆]



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ABSTRACT

This study explored the effect of parent-child facial resemblance on the parent-child relationship in a traditional patriarchal cultural context in China. We analyzed 177 elementary and secondary school students in China. This study found that the father's perceived facial resemblance with the child significantly affected his relationship with the child. However, this result was not found among mothers. In addition, from a perspective of offspring, the sons' perceived facial resemblance with the father significantly predicted his relationship with the father, but this did not apply to daughters. Finally, this study found a mediating of father-child closeness on the relationship between perceived father-child facial resemblances and mother-child closeness. These findings enriched the theory of parental investment and extended the current model of the parent-child relationship.

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1. Introduction

Via internal fertilization and care for the offspring, human females are assured of their genetic contribution to their own offspring (Gaulin & Schlegel, 1980). Conversely, because female ovulation is concealed, males are never fully certain of their paternity (Wilson & Daly, 1992). Furthermore, males face fierce competition when mating (Trivers, 1972), as females can mate with other males (Burch & Gallup, 2000). Therefore, males are faced with the risk of uncertain paternity (Buss, 1999; Larsen & Buss, 2008) and unconsciously seek indirect and direct cues to assess their paternity (Daly & Wilson, 1998). Perceptions of their spouses' fidelity can be defined as an indirect social cue (Apicella & Marlowe, 2004; Flinn, 1988). A male's perception of facial and body odor resemblance between himself and his offspring are two direct cues for identifying whether he has a blood relationship with his offspring (Alvergne, Faurie, & Raymond, 2010; Bressan, Bertamini, Nalli, & Zanutto, 2009). Many studies have confirmed that

of these direct cues, facial resemblance is a good index for identifying a blood relationship between two individuals (Alvergne, Faurie, & Raymond, 2009; DeBruine et al., 2009).

Given the limited resources, the life history strategy assumes that individuals choose the strategies that best suit the environment to allocate their own resources to maximize reproductive benefits (Griskevicius, Delton, Robertson, & Tybur, 2011; Kaplan & Gangestad, 2005). Belsky and colleagues argue that parent-child relationships are the outcome of a life history strategy (Simpson & Belsky, 2016; Belsky, Steinberg, & Draper, 1991). When the offspring have more potential to reproduce their genes, parents will provide their children more emotional and material investment. For instance, the results of previous studies have showed that if parents perceive a high local mortality rate, which indicates that the child may decrease in the process of growth and they thus cannot reproduce their genes, parents may be likely to choose a negative attitude toward parenting. In contrast, when perceiving a low local mortality, which means that children are more likely to grow up and have offspring to reproduce their own genes, parents are more willing to nurture their children and provide them more positive care (Chisholm 1993; 1996). These strategies can ensure a good invest-return ratio of reproduction in different situations. Moreover, because of the paternal uncertainty, the clues of paternity can also have an impact on the amount of investment made by the father on the offspring.

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The amount of material and psychological resources that fathers invest in their offspring, which is vital to offspring's survival and growth, is affected by the degree of paternal certainty of these cues (Alvergne et al., 2009; Alvergne et al., 2010; Gaulin & Schlegel, 1980; Sear & Mace, 2008). Alvergne et al. (2009) study has shown that the more similar the facial characteristics between fathers and their children are, the more resources males invest in their offspring; and the greater investment made by a male in his mate (an indirect investment in offspring), the lower rate of domestic violence (Burch & Gallup, 2000). With regard to unacquainted strangers, people tend to trust and provide more assistance for those who look like them (DeBruine, 2002, 2005; Krupp, DeBruine, & Barclay, 2008). Previous studies have indicated that facial resemblance increases the attractiveness judgments of same-sex faces (DeBruine, 2004). Driven by the desire to reinforce genetic resemblance with the offspring, a male with particular pure recessive genes (e.g., blue eyes) likely chooses a female carrying the same pure recessive gene to ensure the paternal relationship in creating offspring who shows the characteristics of the recessive genes (Laeng, Mathisen, & Johnsen, 2007).

In other studies, parents were asked to evaluate the facial resemblance between themselves and their children. However, self-report measures can be flawed with bias. Mothers tend to report that their children look more similar to their fathers, promoting the fathers' paternity assurance to obtain more resources from them (Alvergne, Faurie, & Raymond, 2007; Alvergne et al., 2010; McLain, Setters, Moulton, & Pratt, 2000; Regalski & Gaulin, 1993). In addition, due to the influence of social desirability, parents are inclined to report that they strive to invest all of the resources they have in their offspring (Alvergne et al., 2010). In order to eliminate the influence of confounding factors in this study, we chose children as participants to retest the hypothesis that the father's perceived facial resemblance with the child predicted the quality of his relationship with the child, whereas, the mothers' perceived facial resemblance did not predict the quality of her relationship with the child (Hypothesis 1). Lewis (2011) adopted a self-rating and an independent third party rating to measure the facial resemblance between children and their siblings. Results have showed that the two scores were highly and positively correlated with each other. Thus, this study assumes that self-rating has a high validity.

Nevertheless, human behaviors are not only influenced by evolutionary mechanisms but also by social and cultural contexts (Bertamini & Lyons, 2015; Shan et al., 2012). In the context of Chinese culture, traditional views hold that males, but not females, are supposed to carry on the family line and take the responsibility of helping aging parents and providing proper burial (Peng, 2011). This idea has been found to be prevalent among elderly people. For example, Lin and Zhao (2014) found that paternal grandparents prefer taking care of grandsons over granddaughters. The gender of grandchildren significantly affected paternal grandparents' behaviors when taking care of grandchildren, grandsons get more affection and support from their paternal grandparents than granddaughters. However, this result was not found among maternal grandparents. This may be attributable to paternal grandparents' views, according to which grandsons carry on and continue the family line, whereas maternal grandparents have no such expectations. The same finding was also found among young parents. Young couples in China had a higher likelihood of divorce when their first child was a girl (Lin & Zhao, 2014). Because of this traditional patriarchal view, the one-child policy, and the development of embryonic techniques, the sex ratio of newborns has been severely imbalanced in China. According to a recent population census by the National Statistics Bureau, the male–female ratio of births has reached 118.06:100 (National Bureau of Statistics of the People's Republic of China, 2011; Peng, 2011). Supporters of the patriarchal view in Chinese culture posit that sons should carry on the family line and inherit the genes. Thus, we argue that patriarchal culture in China will enhance the relationship between father–son facial resemblance and parent–child relationship, while suppressing the same relationship between fathers

and daughters. Building on Hypothesis 1, we further hypothesized that the offspring gender moderates the influence of facial resemblance on the father–child relationship (Hypothesis 2).

As mentioned, the more a father and his child look alike, the more affection and material resources the father invests in his child and wife (Alvergne et al., 2009; Burch & Gallup, 2000). From this point of view, a harmonious father–child relationship can promote a quality marriage. Moreover, by virtue of the father's investment, the mother can better care for her offspring and express more positive affection to her offspring, facilitating the mother–child relationship (Liang et al., 2013). Conversely, if a child does not look like his or her father, the father invests less affection or material resources in the child and mother. This would make the mother more anxious and concerned (Daly & Wilson, 1982) and the child more insecure, undermining the mother–child relationship (Davies & Woitach, 2008). Therefore, we hypothesized that fathers play a core role in the parent–child relationship: The father–child relationship would mediate the association between perceived father–child facial resemblance and mother–child relationship. Furthermore, considering patriarchal views in the Chinese context, the mediating effect of father–child relation may be more significant for boys than girls (Hypothesis 3).

In summary, the purpose of this study is to examine the effects of biological mechanisms and social culture on human behaviors with the perceived parent–child facial resemblance as an independent variable and the parent–child relationship as a dependent variable in the Chinese cultural context.

2. Method

We submitted our research to the local ethics committee for a review and the committee had approved this study. All participants answered the survey voluntarily.

2.1. Participants

For this study, 177 elementary and secondary school students were recruited in Linfen, Shanxi Province in China, one of the cradles of traditional Chinese culture. Seven students were excluded from data analysis, with two excluded students came from a single-parent family, one had missing data, and four provided contradictory answers in response to the items of perceived parent–child facial resemblance. Therefore, the dataset was composed of 170 participants (73 boys), including 44 elementary school students (19 boys), the mean age was 10.86 years ($SD = 1.12$) for the elementary school students sample; 60 middle school students (30 boys), the mean age was 13.22 years ($SD = 0.72$) for the middle school students sample; and 66 high school students (24 boys), the mean age was 17.12 years ($SD = 0.76$) for the middle school students sample. There were 58 participants from one-child families, 51 participants from two-child families, 38 participants from three-child families, 22 participants from four-child families, and 1 with missing data. The mean age was 14.12 years ($SD = 2.70$) for the whole sample. In terms of the father's educational level, 77 students had a father with an educational level below high school, 43 had a father with high school education, 40 with a state-recognized university, nine with a postgraduate degree, and one with missing data. In terms of the mother's educational level, 75 students had a mother with an educational level below high school, 43 had a mother with a high school education, 41 with a university degree, and 10 with a postgraduate degree.

2.2. Instruments

2.2.1. Parent–child relationship measure

The Parent–Child Intimacy scale (Buchanan, Maccoby, & Dornbusch, 1991) was used to measure participants' father– and mother–child relationships. This scale includes nine items, such as “How openly do

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