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Paternal Harsh Parenting in Relation to Paternal Versus Child Characteristics: The Moderating Effect of Paternal Resemblance Belief

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Based on a sample of 338 Chinese parents and their only children, paternal resemblance belief was found to attenuate the association between paternal harsh parenting and child characteristics, such as emotion dysregulation and aggression, and to strengthen the association between harsh parenting and such paternal characteristics as depressive affect and marital dissatisfaction. These findings support the evolutionary view that, as an adaptation to calm paternity doubt, paternal resemblance belief leads to improved paternal investment.
Keywords: child-parent resemblance, paternal resemblance, paternal investment, harsh parenting.

父亲严厉教养与父亲及儿童心理行为特点的关系：父亲与儿童类似性判断的调节作用

本研究分别调查了 338 名中国父母的严厉教养、抑郁情感与婚姻满意度及其独生子女的情感失调与攻击行为情况。研究结果显示父亲对儿童与自己的类似性判断减弱了父亲严厉教养与儿童的情感失调和攻击行为间的联系，但加强了父亲的严厉教养与抑郁和婚姻不满意度间的关系。这些发现支持了父母教养的进化观点，降低父亲的生殖疑虑可能具有进化适应性，父亲与儿童的类似性判断会提高父亲对儿童的投资。
关键词：生殖疑虑，儿童父母类似性，父子类似性，父亲投资，严厉教养。
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Daly and Wilson (1982) were among the first evolutionary psychologists to demonstrate paternal bias in parent-child resemblance belief. Videotaped conversations of postpartum mothers and fathers and follow-up surveys of couples and their relatives contained many references to the newborns' appearance with paternal resemblance being significantly more often remarked upon than maternal resemblance, significantly more often recognized by mothers and mothers' relatives than by fathers or fathers' relatives, and significantly more often noticed for first-borns than later-borns. Mothers' relatives were significantly more often satisfied with naming the newborns after paternal relatives than non-paternal relatives, whereas the same naming effect was absent either with maternal names or among paternal relatives (Daly & Wilson, 1982).

The above observations are consistent with evolutionary parental investment theory (Trivers, 1972) and sexual selection theory (Darwin, 1859/1977). Males and females faced different adaptive problems that threatened their survival and reproduction. As a result, males and females both have evolved different psychological mechanisms as solutions to the adaptive problems unique to their sex. Trivers (1972) extended the Darwinian sexual selection theorizing by pointing out that gender differences are especially profound in how much time, effort, and resources that males and females are willing to invest in parenting. The fact that ovulation and insemination are concealed in human females presents a special reproductive challenge to human males who invest in the wellbeing of the child (Geary, 2000). This challenge is referred to as paternity doubt or paternity uncertainty. In other words, fathers cannot be 100% certain that their children truly carry their genes. Women do not have maternity doubt because mothers have 100% confidence that the babies they deliver are truly their own. Thus, men run the risk of raising children not of their own. Being the unwitting social father to another man's genetic offspring is an evolutionarrily costly problem for males but not females to resolve. Although definitive estimates are not available, such cuckoldry may occur in between 1 and 30 percent of modern day childbirths (Anderson, 2006; Baker & Bellis, 1995; Geary, in press). For this and other reasons, mothers are predicted to be and are more devoted to their children and spend more time with their children than do fathers across cultures (Geary, 1998).

Men are predicted to have evolved psychological mechanisms that help to reduce and limit the likelihood of unknowingly raising another man's

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child. Sensitivity to cues regarding the resemblance between father and child is one such potential mechanism. Female reproductive challenges, on the other hand, were such that women benefit from paternal investment and selection is predicted to have favored women who develop strategies that manipulated these cues and thus increased the likelihood that men will invest in their children, whether or not they are the biological fathers. One way in which women can manipulate these cues is to ascribe child resemblance to the father (Daly & Wilson, 1982). Indeed, several empirical investigations have replicated Daly and Wilson's initial observations (e.g., McLain, Setters, Moulton, & Pratt, 2000) across cultures (e.g., Regalski & Gaulin, 1993). These findings support the evolutionary view that mothers and maternal relatives are biased to perceive and advocate a stronger child resemblance to fathers than to mothers because, as an adaptation, this belief asymmetry serves to reduce paternity uncertainty and presumably increase men's investment in children.

An important next question is to what extent this biased child resemblance belief influences paternal investment. Several studies suggest that fathers do indeed bias their investment in children based on their perceived resemblance to the child and do so more than mothers (Apicella & Marlowe, 2004; Burch & Gallup, 2000; Platek, Burch, Panyavin, Wasserman, & Gallup, 2002; Platek, Raines, Gallup, Mohamed, Thomson, Myers et al., 2004). There is also evidence that men who are not yet fathers show the same preference. In one study, Platek et al. (2002) morphed digital photographs of men and women to create the face of a preschool child that resembled them. Participants were then presented with a set of morphed photos of children and asked to choose the child whom they were more likely to adopt, find most attractive, most likely to spend time with, and invest other resources on. Men were significantly more likely than women to indicate that they would invest in their self-morph (but see DeBruine, 2004). Platek et al. (2004) replicated their original sex difference finding, and in a brain imaging study showed different patterns of brain activation in men and women when they evaluated children that resembled themselves and children that did not. Men's activation patterns suggested attentional focus and active evaluation of the self-morph, and inhibition of potentially negative affect.

Related empirical work has focused and yielded conflicting results on whether infants and young children actually resemble their fathers more than their mothers (Christenfeld & Hill, 1995) or whether they do not (Bredart & French, 1999), and whether they resemble their parents more than unrelated strangers (Oda, Matsumoto-Oda, & Kurashima, 2002; 2005; Bressan & Grassi, 2004; McLain et al., 2000) or whether they do not (Pagel, 1997). These studies suggest that children, on average, do not resemble their fathers more than their mothers and thus the manipulation of paternity resemblance cues is a particularly important potential influence on paternal investment in the child. In other words, resemblance belief as an adaptation could have been selected for, independent of whether the actual resemblance adaptation had taken the route of either "honest resemblance" (Christenfeld & Hill, 1995; Jonestone, 1997) or "concealed resemblance" (Bressan, 2002; Pagel, 1997). In fact, resemblance belief is evolutionarily meaningful when actual parent-child resemblance is ambiguous, just as reported in the literature, but not when actual resemblance is unambiguous, either in the direction of the hypothesized honest resemblance or in that of concealed resemblance.

Ambiguity in parent-child resemblance, already evident in the existing literature, provides a necessary condition for the emergence of father-favoring parental resemblance belief as an adaptation to lessen paternity uncertainty. A sufficient condition would be evidence of paternal investment improvement that is associated with paternally biased child resemblance belief. The purpose of the present study was to seek out and present such empirical evidence. In this empirical effort to link paternal resemblance belief to paternal investment, we also try to extend the existing literature in three ways. The first concerns the age of children. Daly and Wilson (1982) initiated this research on newborns because paternal resemblance as an adaptation to improve paternal investment ought to be selected for when children are most in need of parental investment. However, this early age should also see much reduced variation in paternal investment because, given the life history traits of modern *sapiens*, infant survival without paternal investment would be low. We chose an older age of 4 to 5 years, when most children of this age first leave home to enter kindergarten or preschool. Although more independent, children at this age still benefit tremendously from paternal investment and, in many ways, may need more paternal involvement than at an earlier age due to increasing food consumption, an increased need for learning, expanded exploratory activities, broadened territories to explore, and the associated heightened predatory and accidental injury risks, especially during the ancestral past. Selection pressure to prevent mate desertion may also be stronger at this later child age than when a child is first born because the physical attraction that best serves to reduce paternity doubt and mate desertion decreases rapidly over time (e.g., Sternberg, 1986).

The second way we seek to extend the existing literature is by including Chinese participants for the

first time in this area of research. Except for two Japanese studies (Oda, Matsumoto-Oda, Kurashima, 2002; 2005), existing work in this area has been based on Caucasian, not Chinese or East Asian, populations. One major difference between these two populations is that eye and hair color differs among Caucasians and thus provides identification features of actual parent-child resemblance, especially for judging older children. Hair or eye color is not a salient identification feature among Chinese or Asians who, with seemingly fewer distinctive features for actual resemblance identification, may therefore serve as ideal subjects to study parent-child resemblance belief. Because of the single child policy, which has been successfully implemented in urban China since the late 1970s, all the children in the present study were first born or only children who, compared with later born, make the paternity issue more salient (Schacht & Gershowitz, 1963).

The third way we extend the present evolutionary investigation is by employing the socialization or standard social science model (Cosmedies & Tooby, 1992) and its methodology in order to bridge the gap between the evolutionary approach and the socialization approach in the study of human behavior. We hold the view that distal evolutionary forces predispose human behaviors in ways that result in various proximal associations among the variables that have been routinely defined and investigated within the broad socialization framework. Findings from these investigations, however, show great variability. Evolutionary hypotheses may explain some of these variations by testing an existing socialization model as functions of a specific evolutionary predisposition. In this study, we used parental warmth and harshness, both as defined in mainstream psychology (e.g., Rohner, 1986), to operationalize parental investment in modern day living, and we tested the widely used family systems model about harsh parenting (Almeida et al., 1999; Cox & Paley, 1997) as functions of parent-child resemblance beliefs. The model is presented in Figure 1.

According to the family systems model, harsh parenting represents spillover effects emanating from such negative parental experiences as depressive affect and marital dissatisfaction. Harsh parenting is also a reaction to negative child characteristics such as emotion dysregulation. Modeling and spreading family perturbations, harsh parenting in turn leads to child aggression and other behavior problems (Cox & Paley, 1997; Harnish, Dodge, Valente, and the Conduct Problems Prevention Research Group, 1995). Empirical tests of these spillover effects, however, show large variations (for a brief review, see Chang, Lansford, Schwartz, & Farver, 2004). These variations may suggest potential evolutionary constraints, including paternal resemblance belief, that interact with different family and other environmental dynamics. For example, increased paternity doubt is likely to draw fathers' attention to negative child characteristics, which are also more likely to elicit harsh parenting than with improved paternity confidence. In other words, the "cause" of paternal harsh parenting may be different depending on father-child resemblance belief. With perceived paternal resemblance, harsh parenting may be more likely due to paternal characteristics, e.g., depressive mood and marital dissatisfaction. Harsh parenting, on the other hand, may be more likely a reaction to such child characteristics as emotion dysregulation and aggression when paternal resemblance is not perceived. We hypothesized stronger correlations between paternal harsh parenting and paternal depressive affect and marital dissatisfaction when paternal resemblance was perceived by either parent than when it was not perceived. The correlations between harsh parenting and two child charateristics of emotion dysregulation and aggression were hypothesized to be higher with than without parental report of child-father resemblance.

Method

Sample

A total of 383 children and their parents from two kindergartens in a metropolitan city of China participated in the study. Almost all of these children were only children in the family. Their mean age was 4.78 (*SD* = .55). Fifty-four percent of the sample were boys. The mean age of fathers was 34.64 (*SD* = 4.53) and that of mothers was 31.99 (*SD* = 3.34). Fifty-six percent of fathers and 42% of mothers had attained tertiary education ranging from 2 to 4 years, while the rest had a high school or middle school education. There were no significant differences on any of the variables between the two kindergartens.

Measures

Child Resemblance. Both parents were asked to indicate whether their child looked more like the father than the mother, looked more like the mother than the father, or looked like two parents equally. Other parental measures reported below were also obtained from both fathers and mothers, but only paternal measures were included in this study.

Paternal Harsh Parenting. Eleven items taken from the Chinese translation of the Parental Acceptance Rejection Questionnaire (Rohner, 1986) were used to measure harsh parenting. Sample items included, "When my child does not behave, I will scold, kick, hit, get really mad with, or humiliate him/her." The items were presented on a 4-point scale ranging from "rarely" to "always." Previous work using these items with Chinese parents showed good reliability (e.g., Chen, Wang, Chen, & Liu, 2002). Internal

consistency estimate with the present study was .61for paternal response.

Paternal Warmth was measured by the subscale of the Parental Acceptance Rejection Questionnaire (Rohner, 1986). Sample items included, "I listened to my child, I talk to my child with warmth, I share with my child." Internal consistency reliability estimate was .74 fathers' response.

Paternal Depressive Affect was measured by the 20-item depression subscale of the revised Chinese Personality Assessment Inventory (CPAI; Cheung, Leung, Song, & Zhang, 2001a). CPAI is an indigenous Chinese measure that has been validated in different Chinese populations (e.g., Cheung, Leung, Zhang et al., 2001b). Sample depression items included "I'm pessimistic about the future"; "I feel depressed"; "I'm happy with what I have" (the last being subject to reverse coding). The items were presented on a binary scale where 1 = having the depressive characteristic and 0 = no depressive characteristic. The scale score represented the number of affirmative answers to the depressive symptom questions. The internal consistency reliability estimate was .80 for fathers.

Paternal Marital Dissatisfaction. The 12-item Marital Problem Questionnaire (Shek, 1995) was used to measure marital dissatisfaction. Sample items included "how often do you and your spouse have fights, feel annoyed by each other, feel resenting each other, and consider divorce?" The items were presented on a 6-point scale ranging from "1 = never" to "6 = all the time." Internal consistency reliability estimate was .79 for paternal response.

Child Emotion Dysregulation. Mothers filled out the Chinese translation (Chang, Schwartz, Dodge, & McBride-Chang, 2003) of the Emotion Regulation Checklist (Shields & Cicchetti, 1998). Sample items of the 24-item scale included, "My child responds angrily to limit-setting by adults, can say when she/he is feeling sad, angry or mad, or is easily frustrated." Items were rated on a 7-point scale from "1 = never true of child" to "7 = almost always true of child." Internal consistency reliability estimate was .69.

Child Aggression. One teacher and two assistant teachers of each child independently rated the child on various behaviors. The measures have been used with Chinese children of similar backgrounds (Schwartz, Chang, & Farver, 2001). Reported here were seven items on bullying and aggressive behavior. They are "the child bullies, makes fun of, pushes and hits, starts fights with, takes things away from, yells at other kids and calls other kids bad names." The items were rated on a 5-point scale ranging from "1 = not at all true of child" to "5 = very true of child." The internal consistency of the seven items was .90.

Results

Thirty two percent of fathers and 28% of mothers perceived their child resembled themselves; 24% of fathers and 21% of mothers perceived spousal resemblance; and, 40% of fathers and mothers claimed equal resemblance. Except for the missing responses on this question, where more than twice as many mothers (n = 42) as fathers (n = 19) did not answer the question, there were no statistical differences in the attribution of child resemblance between fathers and mothers (χ^2 (2) = 2.63, n.s.).

Table 1 *Mean Scores and Standard Deviations of the Variables Used in the Study*

	Maternal Perception of Mother-child Resemblance n = 99		Maternal Perception of Father-child Resemblance n = 73		Paternal Perception of Father-child Resemblance n = 110		Paternal Perception of Mother-child Resemblance n = 75		Total Sample n = 383	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Paternal Harsh Parenting	1.73	.32	1.73	.30	1.67	.27	1.80	.34	1.72	.29
Paternal Warmth	2.69	.46	2.62	.38	2.74	.41	2.60	.45	2.68	.44
Paternal Depressive Affect	4.72	3.36	5.08	3.61	4.43	3.31	4.73	4.03	4.48	3.70
Paternal Marital Dissatisfaction	2.21	.53	2.23	.47	2.24	.51	2.20	.56	2.22	.55
Child Emotion Dysregulation	3.50	.61	3.51	.54	3.44	.55	3.64	.61	3.47	.56
Child Aggression	1.86	.70	1.72	.54	1.72	.59	1.74	.56	1.73	.61

The means and standard deviations of the variables used in the study are presented in Table 1. These statistics were derived based on the whole sample as well as four sub-samples representing paternal perceptions of father-child resemblance (n = 110), of mother-child resemblance (n = 75), and representing maternal perceptions of father-child resemblance (n = 73), and of mother-child resemblance (n = 99). Analysis of variance (ANOVA) was conducted to test the hypothesis that fathers who perceived or whose wife perceived father-child resemblance would score higher on paternal warmth and lower on harsh parenting than fathers who perceived or whose wife perceived mother-child resemblance. There were two significant results confirming the hypothesis with respect to paternal but not maternal perception of father-child resemblance. One significant result was on harsh parenting (F (2, 352) = 4.83, p < .01), where Tukey's Honest Significant Difference test suggested that fathers claiming child resemblance to self were

lower on harsh parenting (M = 1.67) than fathers claiming child resemblance to spouse (M = 1.80). The other was related to paternal warmth (F (2, 361) = 2.51, p = .08). Although the overall F test was not significant at p < .05, Tukey's Least Significant Difference procedure showed that fathers claiming self-resemblance were significantly higher on paternal warmth (M = 2.74) than fathers claiming child resemblance to spouse (M = 2.60). There were no differences with respect to maternal warmth or maternal harsh parenting as functions of maternal perceptions of child resemblance.

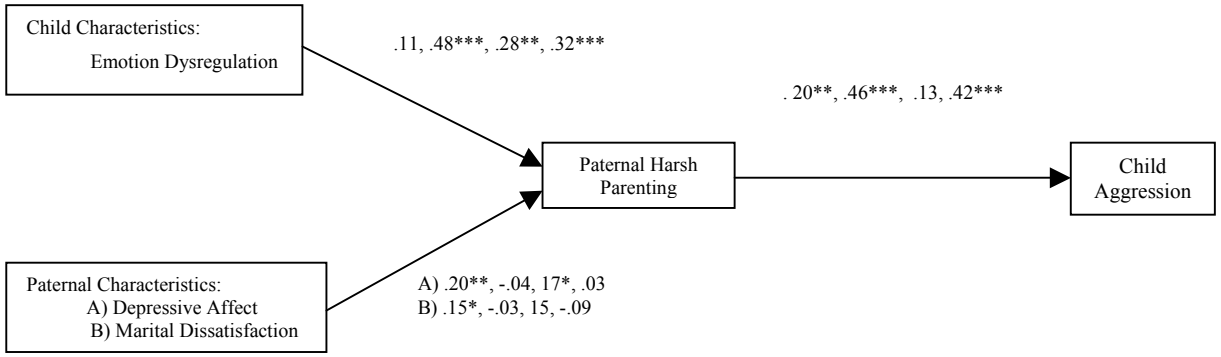

Figure 1. Paternal Harsh Parenting in Relation to Paternal Versus Child Characteristics

Note. The first entry of the regression coefficient was based on the sub-sample (n = 110) where fathers perceived father-child resemblance; the second entry was based on the sub-sample (n = 75) where fathers perceived mother-child resemblance; the third entry was based on the sub-sample where mothers perceived father-child resemblance (n = 73); the fourth entry was based on the sub-sample (n = 99) where mothers perceived mother-child resemblance.

*p<.10; ** p <.05; *** p <.01

To test the differential relations hypotheses, separate path analyses using LISREL were conducted on four sub-samples representing paternal perceptions of father-child resemblance, of mother-child resemblance, and representing maternal perceptions of father-child resemblance, and of mother-child resemblance. The results are presented in Figure 1. As hypothesized, there were positive and significant associations between paternal harsh parenting and paternal characteristics, i.e., depressive affect (β = .20) and marital dissatisfaction (β = .15), on the subsample where father-child resemblance was perceived by fathers. On the subsample identified by the paternal perception of mother-child resemblance, these associations were close to zero. For this sample, harsh parenting was much more strongly associated with child emotion dysregulation (β = .48) and aggression (β = .46), than when father-child resemblance was paternally perceived (β = .11 and .20, respectively). The differences between these two sets of regression coefficients were statistically significant (z = 2.75 for dysregulation and z = 1.96 for aggression).

The associations between paternal harsh parenting and the two paternal characteristics were also stronger when father-child resemblance was maternally perceived (β = .17 and .15 for depressive affect and marital dissatisfaction, respectively) than when mother-child resemblance was perceived (β = .03 and -.09 for depressive affect and marital dissatisfaction), although these differences were not statistically significant. With maternal perception of father-child resemblance, the association between harsh parenting and child aggression was not significant (β = .13) and was significantly weaker than when mother-child resemblance was maternally perceived (β = .42, z = -2.11), both supporting our hypotheses. However, the association between harsh parenting and child emotion dysregulation was the same for these two resemblance perception groups, which did not support our hypotheses.

Similar analyses were conducted on maternal harsh parenting in relation to the same parental versus child characteristics. The results showed no difference between father-child resemblance and mother-child resemblance perceived either maternally or paternally. These results are qualified by the fact that the sub-sample size was small and there was slight overlapping among the four sub-samples. However, improved data are expected to strengthen future results in the same direction as indicated by the present findings.

Discussion

Parenting in general and harsh parenting, specifically, have been extensively studied within the socialization or standard social science model, often yielding variable results (Gershoff, 2002). Explanations of these variable findings have centered on contextualizing forces such as ethnological culture

(Chao, 1994), social economic status (Deater-Deckard & Dodge, 1997), and family systems (Cox & Paley, 1997) that are found to moderate parenting and other socialization processes. Absent from these proximal explanations is a consideration of evolutionary forces that have predisposed human behaviors in such ways that they result in different patterns of cause-and-effect relations in different cultural and social contexts; in this example, as related to perceived paternal resemblance to their child.

Within a widely used socialization model of harsh parenting (Cox & Paley, 1997), the present study showed potential evolutionary constraints on the relationship between paternal harsh parenting and child versus paternal characteristics. Consistent with the family systems model, harsh parenting is in part a reaction to both parental and child characteristics, as were found with both parents in the present study. However, the association between harsh parenting and child characteristics might be mitigated by the paternal perception of father-child resemblance. Negative child characteristics such as emotion dysregulation were more likely to induce harsh reactions from fathers when paternal resemblance was not perceived. Similarly, children reacted less aggressively to paternal harsh parenting when father-child resemblance was perceived paternally, supporting the view that evolutionary forces in general (Belsky, 1993; Belsky, Steinberg, & Draper, 1991) and paternity doubt in particular (Buss, 1996; Geary, 2000; Paola, 2002) may shape socialization and parent-child relationships. Paternity doubt as a unique reproductive challenge to human males does not affect the maternal side of parenting and child socialization, which was shown in the present study by the lack of differential parent-child associations as a function of mother-child resemblance perceptions.

These findings provide initial evidence on the link between paternal resemblance belief and paternal investment. Such empirical evidence supports the theorizing that belief asymmetry about parental resemblance is an adaptation independent of actual parent-child resemblance. These findings also help to solve the controversy between honest resemblance (Christenfeld & Hill, 1995; Johnstone, 1997) and concealed resemblance (Bressan, 2002; Pagel, 1997) hypotheses concerning actual parent-child resemblance. The present findings, together with those on parental resemblance belief as a human inclination (Bressan & Dal Martello, 2002) and on paternal bias in parental resemblance belief (Daily & Wilson, 1982), suggest that a middle ground between honest resemblance and concealed resemblance is more likely than either of these two opposing hypotheses has suggested. A likely scenario might be that selection does not work on actual parent-child resemblance beyond the expected genotypic and phenotypic outcomes. These genetic workings may produce just the right resemblance variations or ambiguities that result in heightened importance for parental resemblance belief.

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