

Theorizing the Father-Child Relationship: Mechanisms and Developmental Outcomes

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Key Words

Activation • Attachment • Competition • Father • Rough-and-tumble play

Abstract

The aim of this article is to propose a theorization of the father-child relationship based on our current understanding of attachment, interactions between fathers and their young children, and human-specific adaptations. The comparison of mother-child and father-child interactions suggests that fathers play a particularly important role in the development of children's openness to the world. Men seem to have a tendency to excite, surprise, and momentarily destabilize children; they also tend to encourage children to take risks, while at the same time ensuring the latter's safety and security, thus permitting children to learn to be braver in unfamiliar situations, as well as to stand up for themselves. But this dynamic can only be effective in the context of an emotional bond between father and child; this relationship is termed the *father-child activation relationship*, in contrast to the mother-child attachment relationship aimed at calming and comforting children in times of stress. The activation relationship is developed primarily through physical play. It is postulated, in particular, that father-child rough-and-tumble play encourages obedience and the development of competition skills in children.

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In many cultures, fathers give very little or no direct care to children [Hewlett, 2000]. However, they generally assume an important provider role as well as various responsibilities related to the child's adaptation to the physical and social environment, depending on the culture. The aim of this paper is to explore the biologi-

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cal necessity of fatherhood, independent of the fact that paternal roles are more culturally variable than maternal roles. Thus, in the first part of the article, an evolutionist perspective of adaptation with regard to fathers will be put forth, considering current knowledge of both human and non-human primates. In the second part, a number of indicators of the importance of paternal authority in past and present Western societies will be described. In the third part, comparisons of fathers and mothers in studies of parent-child interaction will serve as the focus, so as to illustrate the paternal function of fostering openness to the outside world in children. Finally, a theorization of the father-child attachment relationship will be presented, illustrating the father-child activation relationship by presenting the mechanism of rough-and-tumble play and its potential effects on the child's acquisition of social competencies, specifically competition skills.

Mating and Parenting in Human and Nonhuman Primates

In the wild, most nonhuman male primates have little contact with youngsters [Biben & Suomi, 1993]. There seems to be a relation between paternal involvement, sexual dimorphism, and mating systems in primates as in other mammals [see Hamilton III, 1984]. Polygynous species (the most frequent species-type among mammals) are characterized by pronounced sexual dimorphism, with males being bigger and more aggressive than females (e.g. baboons). This dimorphism can be explained by strong competition among males for exclusive access to females, and also by the fact that females choose males with the most potential [Barash, 1982; Fedigan, 1982]. Polygynous primate males generally provide no paternal care, being either indifferent to youngsters or aggressive toward pre-pubescent youngsters; they do however protect their group of females. In promiscuous species (e.g. macaques and chimpanzees), both males and females engage in sexual relations with many partners, but dominant males have priority of access to females. Here too we observe a sexual dimorphism favoring the males, but it is less pronounced than in polygynous species. Males are tolerant of youngsters in the group, and may sometimes play with them, but provide no paternal care. Finally, while the vast majority of bird species are monogamous, there are few monogamous primate species. Nonhuman monogamous primate species (e.g. siamangs, titis) show little or no sexual dimorphism with respect to size or aggressiveness. Moreover, males provide intensive parental care [Mehlman, 1988]. Monogamy in animals is observed essentially in difficult environmental conditions requiring a sizable investment by both parents to ensure the survival of offspring [Wilson, 1975].

What about humans? Humans live longer than other primates, and are also dependent on their parents for longer as children. Large brain size and a prolonged development period (requiring a high degree of parental investment) allow humans to learn the great number of things necessary to their adaptation to an environment which has become increasingly complex over the course of history [MacDonald, 1993]. As a result of humans having developed a high degree of flexibility in their responses to environmental variation through natural selection, modes of mating and parental investment differ according to culture.

Humans are close phylogenetic relatives of chimpanzees. Our common ancestor was probably a promiscuous species, even if, according to Murdock's [1967] highly exhaustive survey, under favorable demographic and socio-economic conditions, 85% of human societies tend towards a polygynous form of union. Humans are also sexually dimorphic with respect to size, strength and aggressiveness. On average, men are taller, stronger and more aggressive than women. With regard to behavior, dimorphism appears during the early stages of human ontogenesis. Sex differences are observed during infancy, with males being more active [Campbell & Eaton, 1999] and females more verbal [Yogman, 1994]. By preschool age, besides being more active than girls, boys also begin to display more physical aggression and a greater tendency to dominate their peers, and are more impulsive, demanding and adventurous [Block, 1983; Coie & Dodge, 1997]. Physical aggression is the most consistent and most widely documented cross-cultural sex difference [Maccoby & Jacklin, 1974], with girls engaging in more indirect aggression, isolation and crying [Sanchez-Martin et al., 2000]. Dimorphism regarding size and strength, however, occurs towards the onset of puberty.

In addition to an ancient human tendency towards polygyny or promiscuity, many anatomical and physiological characteristics would seem to support the hypothesis of a recent evolutionary trend towards monogamy [see Lévy & Baruffaldi, 1991], independent of the social imposition of monogamy that has occurred since the Roman Empire [Taub & Mehlman, 1991]. Fossils show sexual size dimorphism to be less pronounced in humans today than it was in our hominoid ancestors [McHenry, 1996]. Further, relative testicle size in primates is generally related to the number of potential sexual partners, and of all current primate species, the human male has the smallest testicles [Campbell, 1985]. Moreover, human beings differ from other primate species with respect to the relative importance of sexuality. Indeed, many human characteristics are related to the establishment of continuous sexual activity [Hamilton III, 1984] and are interpreted by sociobiologists as evolutionary strategies to induce the male to stay with the female for as long as possible [Alexander & Noonan, 1979], so that he will bond with her, and eventually become involved on both a conjugal and a parental level.

Another selective pressure that has played an important role in this recent tendency towards monogamy and hence paternal investment is related to the phenomenon of neoteny [Lovejoy, 1981]. Neoteny is the conservation of juvenile characteristics in adulthood. Resemblance of the human adult male skull with that of the young male chimpanzee shows a reduction in the growth rate of the human brain over the course of human evolution. The juvenilization of the brain of our ancestors made possible an extraordinary increase in its volume. Due to the difficulty of childbirth, natural selection would have favored women who gave birth prematurely [Fisher, 1983; Shepher, 1978]. Thus, the brain of the human baby is not completely developed at birth and continues to develop during the first year of life. Furthermore, human babies are less physically developed, more vulnerable, and therefore, more dependent on their mothers than other primate babies. This need for a greater maternal investment in caregiving, which would leave the mother less time to find food, would in turn act as a selective pressure for greater paternal investment, at least with regard to protection from predators and the provision of food (especially game) necessary to the survival of the mother-child dyad [Benshoff & Thornhill, 1979; Ellis, 1992]. This division of labor would increase the reproduc-

tive success of the human species by enhancing children's chances of survival, while reducing mortality and the lapse of time between births (one to two years for humans versus five to six years for chimpanzees). Thus, the human species has evolved along a unique and highly complex path that distinguishes it from other primates. An increased need for parental care would account for the type of indirect male parental contribution found in humans but not in other primates [Mehlman, 1988], permitting women to have many young children at the same time [Lancaster & Lancaster, 1987]. According to evolutionary biology, fathers have two means of directly promoting reproductive fitness: the quantity reproductive strategy consisting of increasing mating efforts with various partners in order to have more children, and the quality reproductive strategy consisting of investing in parenting in order to increase the chances of one's offspring surviving long enough to have children of their own [see Josephson, 2002]. The children of polygynous men would seem to have a somewhat lower rate of survivorship than the children of monogamous men, and polygynous women would seem to have fewer children on average than monogamous women [see Josephson, 2002].

The notion of parental investment introduced by sociobiologists is very interesting, for it includes the notion of parental involvement or direct interaction with children (caregiving, proximity, protection, education, feeding, etc.) as well as more indirect contributions (maintenance of the home, provision of resources, socio-emotional support of the mother, etc.) which may have a non-negligible influence on the health and development of children. The literature supports the notion that paternal provisioning permitted the improvement in child physical health and the reduction of child mortality risks in pre-industrial and industrializing Europe as well as the United States, and plays the same role in developing nations today [Geary, 2000].

The Importance of Paternal Authority

Now that we have touched on the possible importance of paternal provisioning over the course of human evolution, let us examine whether fathers play specific, more direct roles with children. In general, biological relatedness accounts for paternal involvement with children [Tamis-LeMonda & Cabrera, 2002]. Given that the vast majority of studies on paternal involvement have been conducted in Western societies, let us focus for the moment on the latter. It would appear that biological fathers in our societies tend to be warmer and to monitor their children more carefully than stepfathers or mothers' boyfriends [Hofferth, Stueve, Pleck, Bianchi & Sayer, 2002], with stepfathers tending to be more authoritarian, and boyfriends more permissive.

Until recently in Western societies, the parental roles of the father and the mother were entirely distinct: the mother provided care and tenderness while the father represented authority and discipline [Bourçois, 1993]. The massive entry of women into the workforce and the important changes in family structure that have occurred since the 1970s have transformed parental roles. Surveys have shown that, over the course of the 1990s, the sharing of caregiving-related tasks in two-parent families became customary for a large number of families in certain socio-demographic categories. The new nurturant father continues to enforce au-

thority, while both mother and father tend to share in emotional support, monitoring and discipline of children as well as in parent-child play [Hofferth et al., 2002].

We do not as yet know much of the effects of these new family structures on child development. One of the consequences of these transformations in family structure is the absence or intermittent presence of the father which, combined with a tendency towards the standardization of parenting practices, and the parental permissiveness which most likely developed in reaction to the excessive parental authority in families of yesteryear, may at least partially explain the increase in social adaptation problems among children, especially boys. Indeed, externalizing behaviors, school drop out, substance addiction and suicide are far more prevalent problems among boys than girls [Dumas, 1999]. Externalizing behaviors, consisting on the one hand of attention disorders and hyperactivity, and on the other, of so-called anti-social behaviors such as aggressive behavior, theft, failure to respect rules, impulsivity, opposition, lying, and vandalism, are indications of a young person's lack of control over his or her emotions [Kazdin, 1987]. Parenting practices are among the primary precursors of externalizing behaviors in school-age children [see Shaw & Vondra, 1995]. Externalizing behaviors are as closely associated with a lack of disciplinary rules as with the use of coercive and abusive disciplinary practices [Greenberg, Speltz & DeKlyen, 1993; Rubin, Stewart & Chen, 1995]. Indeed, parents who are too lax are more likely to engage in coercive cycles of interaction [Shaw & Bell, 1993]. It is especially difficult for single mothers, for example, to maintain consistent discipline, especially under stressful and impoverished conditions.

A number of studies in the past suggested a relation between paternal absence in single-parent families and behavioral difficulties in children. Girls growing up in homes from which the father is absent have been found to tend to display internalizing behaviors, while boys have a tendency to develop externalizing behaviors, be less popular and more reluctant to engage in rough play [see Parke et al., 2002]. However, these studies were not able to distinguish between the effects of the lack of significant father-child relationship and the co-occurring effects of a reduction in family revenues and an increase in stress subsequent to parental separation [McLanahan, 1997]. More recently, Amato and Rezac [1994] have demonstrated that boys from single-parent families who continue to have contact with their fathers have fewer behavioral problems than those who have no contact with their fathers. Coley [1998] has shown that a certain degree of parental control by a father figure (whether he is the child's biological father or not) is a predictor of fewer behavioral difficulties at school and more pro-social behaviors towards peers. Other research has shown that paternal antisocial personality is more highly correlated to externalizing problems in children, especially boys, than to internalizing problems [Phares & Compas, 1993]. Fathers who recalled an early attachment relationship with their parents characterized as 'low' in the expression of love and 'high' in the expression of anger have children who tend to be rated as more externalizing in kindergarten [Cowan, Cohn, Cowan & Pearson, 1996]. Jaffee's [2002] study with 1,116 five-year-old twins and their parents demonstrated the antisocial personality of the father (and not the mother) to be a predictor of child behavioral difficulties, even after controlling for genetic factors, especially when the antisocial father lives with his children. In short, while the father's absence affects the child's social de-

velopment, the study of the quality of the father-child relationship is a more promising means of explaining why fathers exert authority over boys more easily than do mothers.

The impact of mothers on child development has been the topic of a great deal of study over the past fifty years. The models and methods developed for studying the mother-child relationship have also been applied to fathers, and indicate that fathers also contribute to the cognitive and emotional development of children [see Lamb, 1996]; however, little is known about the specific contribution of fathers to children's social competence [Parke et al., 2002]. Growing numbers of researchers now believe that it is essential to develop theories and methods specific to fathers. This might contribute to overcoming the well-known difficulty in eliciting paternal involvement in both research projects and intervention with children and adolescents experiencing social adaptation-related problems.

The Function of Opening Children to the Outside World

There are data supporting the idea that the different parental roles played by the father, including that of authority figure [see Le Camus, 2000], are part of a more general function, that of opening the child to the world. This function of opening children to the outside world is an integral part of the psychoanalytical model. According to the tenets of this approach, in introducing the child to the social world, the father enables the child to separate from the mother, mediating the child's transition away from a fusional relationship with the mother. The paternal function of opening children to the world assumes its full importance in light of the complexity of the social world of the human species, and the numerous lessons human children must learn in order to adapt to their environment, especially given that their mothers, in the past at least, could be quite busy caring for their numerous offspring. However, I would posit that this mother-child separation might be no more than a secondary effect of the opening of children to the world, which fathers, in my opinion, simply facilitate, with children being naturally driven towards ever-increasing autonomy (it should be remembered that young monkeys generally become autonomous without paternal intervention).

The first studies comparing father-child and mother-child interaction involved infants. They demonstrated that if the behavior of fathers is often less sensitive than that of mothers, both fathers and mothers are able to respond to infants' signals, and to interact and communicate competently with their babies [Parke & O'Leary, 1976; Pedersen, 1980; Yogman, 1981]. An important difference is that fathers tend to try to excite their children whereas mothers try to contain them [Dixon, Yogman, Tronick, Adamson & Brazelton, 1981]. Moreover, fathers have a tendency to engage infants in non object-mediated interaction that is both physical and stimulating, as well as in unpredictable or idiosyncratic play, while mothers tend to be more didactic and verbal with infants and engage primarily in visual object-centered play so as to attract and keep their babies' attention [Clarke-Stewart, 1978; Yogman, 1981, 1982; Power & Parke, 1983]. Fathers are also more physical than mothers with preschool age children [MacDonald & Parke, 1986].

One of the most interesting results of empirical studies on paternal involvement has to demonstrate that fathers are generally less involved than mothers in all

aspects of parenting with the exception of physical play. Mothers spend more time than fathers with their infants, but the time devoted to physical play in relation to other activities is proportionally more important for fathers [Bronstein, 1984; Keyes & Scoblic, 1982; Russell & Russell, 1987]. Also, from the first to the tenth year of their children's lives, fathers engage more frequently than mothers in vigorous physical play, with mothers engaging primarily in cognitive object-mediated play and role-playing [Crawley & Sherrod, 1984; MacDonald & Parke, 1986]. Fathers engage in more physical play with their sons than with their daughters [Jacklin, DiPietro & Maccoby, 1984], whereas mothers encourage the pretend play of daughters more than that of sons [Tamis-LeMonda & Bornstein, 1991]. Mothers are primarily perceived by children as sources of well-being and security, while fathers are the preferred playmates, particularly by boys [Lamb, 1997].

Labrell's [1996, 1997] research reveals that, in play involving toys, fathers use objects as a pretext for physical contact with children and propose more unconventional games than mothers; for example, fathers often use objects in an incongruous way, i.e. not accordingly to everyday usage patterns. Moreover, during physical play, fathers use teasing to destabilize children both emotionally and cognitively. As pointed out by Labrell [1996], both irregularities and regularities are important to cognitive development, and children need to learn to deal with unexpected events. According to Le Camus [1995a], the need of children to be stimulated, pushed and encouraged to take risks is as great as their need for stability and security. Comparing the interactions of fathers and mothers with their one-year-old offspring during infant swimming classes, Le Camus [1995b] showed that fathers tend to stand behind their children so the children face their social environment, whereas mothers tend to position themselves in front of their children, seeking to establish visual contact with the children, who in turn are constantly looking at the other parent-child dyads. Moreover, fathers act as catalysts for risk-taking [Kromelow, Harding & Touris, 1990], inciting children to take initiative in unfamiliar situations, explore, take chances, overcome obstacles, be braver in the presence of strangers, and stand up for themselves. In other words, fathers seem to play an essential role in the empowerment of children and the opening of children to the outside world [Le Camus, 1995a].

This function of opening children to the world is also mediated by language. Fathers have a tendency to use more unfamiliar words with young children than mothers [Ratner, 1988], and to ask for clarification more often, inciting children to reformulate their thoughts in order to be understood by social partners other than their mothers [Tomasello, Conti-Ramsden & Ewert, 1990]. Fathers also make more problem-solving related demands than mothers, who tend to solve problems in place of their children [Labrell, 1992]. Finally, fathers make more action-related demands regarding the accomplishment of tasks than mothers, while the verbalizations of mothers concern primarily emotion-related contents [Marcos, 1995].

While a relative lack of differentiation in parental roles would appear to be the more socially desirable model, the work of researchers in Toulouse, France suggests that the family structure that is most favorable to the socio-affective development of young children is one in which both parents are involved from the early stages, but with differentiated fields of activity involving clearly polarized maternal and paternal functions. Le Camus, de Léonardis and Lescarret [1989] have concluded from their study that, in comparison to single-parent children, dual-parent

children tend to be more mobile, active and autonomous, and have a more elaborate sociality both in terms of competition and collaboration. More recently, Bourçois [1997] has shown that, in dual-parent families, children from involved and differentiated parents (with distinct functions such as caregiver versus playmate) present a more highly developed sociality (are more interactive, more involved and more open with playmates), and are better prepared for both competition and cooperation than those with involved but undifferentiated parents. Finally, according to Ricaud [1998], as compared to children of differentiated fathers with little involvement in parenting, and children of two involved, undifferentiated parents, children of involved and differentiated parents have fewer conflicts with peers, fewer aggressive interactions and more affiliative interactions, primarily exercising mutual agreement to resolve conflicts, and employing the dissuasive effects of speech rather than physical violence. These results reveal the possibility that the paternal function of opening children to the world may still be as much a reality today as in the past, even where fathers and mothers tend to accomplish the same educational tasks [see Ricaud, 1998]. It should be noted that children necessarily have different experiences with their mothers than with their fathers, for the physical and psychological differences between the two parents are greater than those between two individuals of same sex: mothers and fathers do not have the same odor, voice, face, or muscle tone, and do not give out the same messages [Le Camus, 1995a]. These differences in parental input provide a wealth of experiences for children, and more studies involving a systemic family approach should be undertaken in order to gain a better understanding of the complementarity of maternal and paternal contributions.

Parent-Child Attachment

Mother-Child Attachment

In order to better understand the pathogenic effects on children's mental health of a lack of maternal care due to early and prolonged separation, Bowlby [1969] looked to the experimental work of ethologists with non-human primates [e.g. Harlow & Zimmerman, 1959]. Their studies revealed that the search for comforting physical contact is independent of feeding needs (breastfeeding) and necessary to future social development. The emotional bond between a mother and her child promotes physical proximity between the two thus ensuring the care and protection of the child. Mother-child attachment is essential to the survival of young mammals in early life, especially in non-precocious species such as primates whose motor and perceptual abilities are not fully developed at birth and continue to develop slowly during infancy [Petrovich & Gewirtz, 1991].

Four major predictions of attachment theory have been verified by a number of studies over the past twenty-five years using the well-known Strange Situation Procedure (SSP) to assess the quality of children's attachment between the ages of 12 and 18 months [Ainsworth & Wittig, 1969]. First, mothers who are sensitive to their children's signals and respond to them in appropriate and contingent ways provide the basis for a secure mother-child relationship [Ainsworth, 1984; Isabella & Belsky, 1991; Smith & Pederson, 1988]. Second, infants who have secure relationships with their mothers tend to explore their environments more than insecure

children, and subsequently develop better social competencies at preschool and school age [Jacobson & Wille, 1986; LaFrenière & Sroufe, 1985; Renken, Egeland, Marvinney, Mangelsdorf & Sroufe, 1989]. Third, mother-child attachment is relatively stable. Prospective studies found a correspondence of 64–75% between infant attachment and adult attachment 20 years later [Waters, Crowell, Treboux, Merrick & Albersheim, 1995]. Finally, there would seem to be an intergenerational transmission of attachment from mother to child. Studies have shown a correspondence of 68–80% between mothers' classifications [with the AAI: George, Kaplan & Main, 1985] and those of their children [Benoit & Parker, 1994; Ward & Carlson, 1995].

Father-Child Attachment

Attachment theory proposes a hierarchical model of attachment figures in which the mother is the main figure, and a differential influence is attributed to each figure [Main & Weston, 1981; Lamb, 2002]. In fact, young children are biologically predisposed to develop a specific attachment to stable individuals in their immediate environment [Grossmann & Grossmann, 1998]. Babies become attached to both their fathers and their mothers at approximately the same time during the first year of their lives, although most of them show a preference for their mothers, as evidenced by their separation anxiety [see Lamb, 1997]. On the other hand, according to Lamb [1977a, b], boys start to show a clear preference for interaction with their fathers during the second year of life, whereas girls show no consistent preference for either parent.

Over the years, researchers have demonstrated Strange Situation classifications obtained with mothers and fathers to be independent of each other [van IJzendoorn & Bakermans-Kranenburg, 1996], suggesting that children may develop a different type of attachment with each of their parents. These results have been seen as confirmation that attachment is a factor of the parent-child relationship and of the specific history of the child's interaction with a particular adult. On the other hand, the stability and intergenerational transmission of father-child attachment have been shown to be very weak as compared to mother-child attachment [van IJzendoorn, 1995]. Finally, studies have shown a lack of prediction by infant-father attachment (as evaluated by the SSP or the Q-sort) of subsequent behavior in preschool children [Suess, Grossmann & Sroufe, 1992; Youngblade, Park & Belsky, 1993].

In light of these results, and taking into account the fact that the SSP was developed and validated in the context of the mother-child relationship [see van IJzendoorn, 1995], some researchers question the appropriateness of using this procedure to evaluate the quality of children's attachment relationships with their fathers [Grossmann & Grossmann, 1998]. The emphasis placed on the mother in the basic model is so great that, until now, there has been very little exploration of paternal roles. It is essential that we now either adapt the SSP to the context of the father-child relationship or explore other types of measures that take into account parental roles specific to fathers. According to Grossmann and Grossmann [1998], it seems necessary to use a method other than the SSP, places greater emphasis on the exploration/attachment balance, to assess the quality of father-child attachment.

In addition, Dubeau and Moss [1998] have shown no association between the interactive characteristics of fathers and the security of father-child attachment as evaluated using the Waters and Deane's [1985] Q-sort, an alternative to the SSP. The problem lies in identifying the theoretical premises that could provide the basis for such a procedure and permit the generation of predictions regarding direct paternal influence on the child's social and emotional development, instead of viewing the father simply as a second mother or, indirectly, as a support to the mother. Lamb [2000], for example, has suggested that attachment theory should be developed further by taking into account paternal deprivation literature, especially with regard to boys who grow up in fatherless families. The time has come to develop a better understanding of the pathogenic effects not only of paternal absence, but also of poor quality father-child interactions.

The Father-Child Activation Relationship

As we have seen, where there is positive interaction between father and child, an emotional bond develops as early as infancy. Also, fathers seem to prefer exciting activities for children whereas mothers seem to favor quiet activities, and infants respond to fathers with more excitement than to mothers when the fathers develop heightened, arousing, and playful relationships with them [Yogman, 1994]. It would also seem that fathers change diapers, wash and feed babies in the same vigorous, exciting manner they engage in face-to-face play with their children, whether as primary or secondary caregivers [Yogman, 1994]. Several researchers have proposed the concepts of phasic dialogue (versus tonic dialogue with the mother: Le Camus, 1995a) and disruptive harmony (versus homeostatic harmony: Herzog, 1992) to underscore the dynamic and transitory aspects of paternal behavior. It would thus appear extremely important that the effects of the qualitative difference of father-child contact on child development be studied.

In reference to Bowlby's [1969] attachment theory, I would suggest employing the term 'activation relationship' to designate the attachment bond that fosters children's opening to the world. As the term 'attachment' currently has strong associations with the notion of the child's confidence in the parent's response to the child's basic needs, particularly the need to be reassured in stressful situations, it would seem more appropriate to use a different term to describe the father-child relationship. As opposed to the mother-child attachment relationship, which permits the child to be calmed, the 'father-child activation relationship' satisfies the child's need to be stimulated, to overcome limits, and to learn to take chances in contexts in which the child is confident of being protected from potential dangers. Infants may be predisposed to seek an appropriate balance of both arousing and well-modulated experiences [Yogman, 1994]. In the same way that children use signals to maintain proximity and receive care from adults, they also seek out intense stimulation and prompt both men and women to provide such stimulation in non-stressful contexts, although they receive it primarily from men.

Attachment theory views attachment and exploration as two different and complementary systems. Attachment ensures proximity between children and attachment figures, and hence protection, while exploration ensures acquisition of environmental knowledge and adaptation to variations in the environment

[Ainsworth, 1972; Bowlby, 1969]. According to attachment theory, openness to the outside world is highly dependent on the quality of attachment [Grossmann & Grossmann, 1998]. Exploration of the environment is possible when the child's needs have been met by the primary caregiver [Ainsworth, Blehar, Waters & Wall, 1978; Bowlby, 1969]. Mothers and fathers alike encourage children to explore their environments. Most differences between mothers and fathers are not great: both parents encourage visual exploration, object manipulation, and attention to relations between objects, and cause and effect [Power, 1985; Teti, Bond & Gibbs 1988], but fathers do so differently from mothers.

The father's activation function goes far beyond the socializing function attributed to fathers by some ethologically oriented theorists [see Palmer, 1993], for it involves the exploration of the physical as well as the social environment. In a high quality activation relationship, the child would learn to trust his or her own ability to deal with threats and strangeness in the physical and social environment, as the father would encourage his child to take ever greater risks while ensuring that exploration was conducted in a secure context, i.e. protecting the child by imposing disciplinary limits. Yogman [1994] suggests that fathers may play both an indirect and a direct role in their children's lives: an indirect role via the emotional and physical support given to their children's mothers during stressful periods; and a direct role in their children's development with respect to exploration and autonomy, beginning as early as the second year of life during non-stressful periods. The term 'activation' may also be understood to refer to the triggering of emotional arousal mechanisms stimulated by exposure to new experiences, or strangeness – an essential step in the development of social competencies [see Carson, Burks & Parke, 1993].

Lamb, Pleck, Charnov and Levine [1985] submit that physical father-child play contributes to the development of children's attachment to their fathers. Mother-child attachment is developed primarily in a caregiving context, but while the activation relationship could theoretically develop in various parental contexts, it is quite possible that father-child attachment is developed primarily through physical play. The high intensity of physical play could account for children developing strong bonds with their fathers even in situations when the father is less present than the mother. In fact, the greater consistency in infant-parent affect during play as opposed to feeding suggests that infants and parents may be more affectively 'tuned in' to one another in a play context [Palmer, 1993]. According to Schwartzman [1986], children do not necessarily need extensive amounts of play-time in order to benefit from the activity. The quality of parent-child interaction is more important than the quantity of involvement; this may be even truer for fathers or adults who engage in physical play with their children [see Parke, 2000].

Hitherto, play has been studied primarily in the aim of understanding cognitive child development [see Labrell, 1996]. Most studies on the topic deal with the ontogeny of symbolic play with parents [see Bornstein & Tamis-LeMonda, 1995] and sensori-motor exploration or play [see Ruff & Saltarelli, 1993] during infancy. Parents and children have generally been invited to play freely together in the presence of toys, a context which seems to have encouraged primarily maternal types of play such as make-believe [Power, 1985]. According to Frascarolo [1997], a toyless play situation, as opposed to the usual free play situation, would have revealed sooner and more clearly the propensity of fathers for physical play. There has been little

research on physical parent-child play. Here, we understand the term 'physical play' to include such well-known forms of play involving parent-child physical contact as bouncing the child on the parent's knee, playing 'horsy,' tickling, play-fighting once the child is of preschool age, and so forth.

Parent-child interaction synchrony is an important antecedent to attachment and is also an important element of physical play [Kerns & Barth, 1995]. Few studies have examined the effects of parental sensitivity on father-infant attachment security. Parental sensitivity may be different in a play context from a caregiving context. Kerns and Barth [1995] have shown that in secure dyads fathers use a more directive style during physical play than in insecure dyads, whereas maternal attachment was not shown to be related to any of the measures of play quality. Grossmann [1997] clearly illustrated the 'paternal challenging sensitivity' in a play situation with 2-year-old children. This way of encouraging children's exploration skills was shown to be stable over time, with no correlation to father-child SSP, but tied to the attachment representations of both fathers and their children at age 16 as evaluated using the AAI [Grossmann et al., 2002]. These results support the hypothesis that fathers may provide more support during the exploratory play of toddlers whereas mothers may provide more comfort when children are in distress.

Parent-child attachment may develop through different dimensions of parental behavior, paternal or maternal, depending on environmental conditions. Nevertheless, on average, men display a greater tendency to engage in physical play with children whereas women display a greater tendency to engage in caregiving or cognitive play. Studies conducted in various European and North American countries demonstrate that fathers are more likely to play with infants than to feed or clean them despite greater task-sharing than in the past [Lamb, 2002]. Distinctive maternal and paternal styles are highly tenacious even when the father is very involved in caregiving: fathers who are the primary caregiver nevertheless engage in more play than mothers [see Lamb, 2002]. Fathers who are more involved in caregiving and mothers who have paid employment do not alter their typical paternal or maternal styles of play [Field, 1978; Stuckey, McGhee & Bell, 1982]. Field et al. [1984] have shown that while working mothers play more with their infants than fathers, they tend to engage in face-to-face play. Hossain and Roopnarine [1994] have shown that African-American fathers spend more time playing with than caring for their children despite an equitable division of caregiving responsibilities.

According to Ainsworth [1990], parents who are capable, secure bases may not be capable playmates. It is difficult to conceive of the parent as simultaneously assuming the roles of both comforting and destabilizing the child. Concretely, these are opposite processes, and we can well conceive of a father-mother complementarity that would be important to child development. The two mechanisms are very closely linked. In fact, father-child activation through play may actually be dependent on mother-child attachment, given that play is more likely to occur once a child's basic needs (hunger, thirst, security, etc.) have been satisfied [see Millar, 1968], and that responsibility for meeting basic needs generally lies with the mother. From this perspective, children who have developed a secure attachment to their mothers would tend to benefit more from father-child play.

According to the present model, the SSP appears to be an appropriate instrument for assessing the quality of father-child attachment in those instances in which the father is the primary caregiver, i.e. where he is more involved in caregiving than in play. Kazura [2000] found a relation in dual-parent families between the quality of attachment (as evaluated with the SSP) and joint pretend play with the father but not with the mother, even though the fathers spent less time than the mothers caring for and playing with the children each day: children who were securely attached to their fathers exhibited higher pretend play competency than insecure children. These results suggest that the SSP may be able to evaluate at least one dimension of father-child attachment: the dimension that, via pretend play, may permit the development of social competencies. On the other hand, it would seem that another procedure should be used to evaluate the father-child relationship when the father is the primary playmate.

The father-child activation relationship will be illustrated by presenting a few predictions regarding the impact of the most frequent form of father-child physical play after the first year, i.e. *rough-and-tumble play* (RTP). Of all forms of human play, RTP is the least studied by researchers, in part because it is often perceived by adults as being boisterous, disruptive and potentially dangerous [Panksepp, 1993].

Father-Child RTP and Developmental Outcomes

Play is characteristic of immature members of the most recent species on the phylogenetic ladder, i.e. mammals and birds [Reynolds, 1981], but it is in primates, and in the human species in particular, that play is most highly developed [MacDonald, 1993] in terms of frequency, variety and complexity. Play permits the young brain to remain flexible, enabling it to react to an immense variety of potential stimuli [MacDonald, 1993].

Parent-child physical play has been linked to motor development in children, but we are just beginning to consider the possibility that it may also promote socio-emotional development in children. After a review of primate RTP, the hypothetical impact of RTP on obedience and the acquisition of competition skills in children will be discussed.

Rough-and-Tumble Play (RTP) in Primates

Unlike the vast majority of nonhuman primates, humans engage in physical father-child play. We know very little about parent-child RTP. It seems that at its peak, around the age of four, parent-child RTP accounts for only approximately 8% of interactions [Pellegrini & Smith, 1998]. Children – especially boys – prefer physical play with either parent to any other form of play, but their pleasure seems to be more intense during physical play with their fathers [Ross & Taylor, 1989]. Fathers spend more time and engage in more RTP-type physical play with sons than with daughters [Carson et al., 1993; MacDonald & Parke, 1986].

On the other hand, a certain amount of research has been done on child RTP with peers. RTP refers to vigorous behaviors, such as wrestling, grappling, kicking and tumbling, which happen in a play context [Pellegrini & Smith, 1998]. Studies

show that child-child RTP is observable from preschool age until the beginning of adolescence, peaking at between the ages of 8 and 10 (at roughly 10% of interactions: Pellegrini & Smith, 1998). Boys tend to engage in more RTP than girls in all cultures studied [Carson et al., 1993]. This sex difference seems to appear at a very early stage of child development and to be due to a modification of the central nervous system caused by prenatal testosterone judging from experiments carried out on various animals including nonhuman primates [Goy, 1978; Ward & Stehm, 1991]. Moreover, it is interesting to note that girls exposed to higher than usual levels of androgens before birth (CAH: *Congenital Adrenal Hyperplasia*) are more likely to be tomboyish, and appear more interested in RTP [Hines & Green, 1991]. Since girls with CAH begin life with rudimentary male genitalia, it is possible that parents may unconsciously encourage more masculine play in their initially masculine-appearing daughters. However, Erhardt and Meyer-Bahlburg [1981] contend that the opposite reaction is actually more likely: parents would try harder to feminize daughters who displayed physical signs of masculinization at birth. In short, sex differences with respect to the frequency of both serious and playful aggression would seem to be due to children's predispositions, which are reinforced to varying extents by parents [see Boulton & Smith, 1992].

RTP and aggression are distinct categories of behaviors [Humphreys & Smith, 1987]. According to observations made in different cultures, there is no correlation between RTP and aggression during childhood, and it is only towards the end of childhood that RTP may occasionally escalate into real aggression [Pellegrini, 1988]. Moreover, a positive correlation has been shown between testosterone and serious aggression, but no correlation has been shown between testosterone and aggression in a play context [Sanchez-Martin et al., 2000]. According to Tremblay et al. [1998], however, testosterone is primarily correlated to dominance, as well as to serious aggression as used to increase or maintain dominance status in early adolescent boys.

RTP is a system composed of mechanisms aimed at promoting physical contact between participants while preventing injuries [see Paquette, 1994]. According to MacDonald [1993], the phylogenetically ancient RTP mechanisms are the same in all mammals and have also been observed in human children from different cultures [Boulton & Smith, 1992].

Young male primates play more often and more vigorously than females [Chalmers, 1983], as in many mammalian species [Smith, 1982]. According to Wilson [1975], the higher rate of male participation in physical play is related to the greater degree of male competition observed in mammals. Studies on animals have clearly established a relation between play and socialization, particularly in primates [see Hughes, 1999]. In monkeys, the socialization experience is provided by peer play. Rhesus monkeys raised by their mothers but prevented from playing with peers were later rejected by their age-mates, and even displayed many aggressive behaviors [Novak & Harlow, 1975]. Five main functions have been attributed to RTP: (1) the promotion of social cohesion by the formation of social ties between youngsters [Bekoff, 1984]; (2) the development of fighting skills [Pereira & Altmann, 1985]; (3) the familiarization of youngsters with dominant and subordinate roles [Pereira & Altmann, 1985]; (4) the mutual assessment of participants' strength and abilities [Poirier & Smith, 1974]; and (5) the establishment and maintenance of dominance [Paquette, 1994]. As youngsters approach sexual maturity,

RTP becomes more and more asymmetrical, ultimately becoming a reflection of aggressive interactions [Humphreys & Smith, 1987]. The results of studies with young adolescent humans confirm their use of RTP to establish dominance [Pellegrini & Smith, 1998].

Father-Child RTP and Child Obedience

The preschool period (two to five years of age) is marked by the child's quest for greater autonomy. During this period, parents usually adopt behaviors that encourage greater autonomy in the child, and also provide the education and supervision necessary to ensure the child's safety and healthy socialization. Parental discipline therefore plays a very important role at this stage. Studies have shown that parents who are affectionate and able to set clear rules and limits for children enable the latter to develop self-confidence, become responsible, and cooperate with adults and peers at preschool age [Baumrind, 1971], as well as to have social and academic skills at school-age [see Hastings & Rubin, 1999]. Limits help children feel secure, as long as they are reasonable and do not impede the development of autonomy. It would also appear that parental control is less effective and has negative consequences on child development if it is not combined with affectionate parental involvement [see from Paquette, Bolté, Turcotte, Dubeau & Bouchard, 2000]. Parents who use a lot of control to get their children to obey and respect authority, without taking into account their children's needs or being affectionate, may very well cause their children to rebel and challenge their authority. Rejected, aggressive boys reported receiving less affection from their fathers (but not from their mothers) than did rejected, non-aggressive, neglected boys [MacDonald & Parke, 1984].

Fathers tend to be harder on boys or punish them more than girls [see Farver & Wimbari, 1995] and use a more direct verbal form of control (imperative form of requests) instead of the suggestive or interrogative forms favored by mothers [McLaughlin, 1983]. Because boys are more aggressive, more active, more impulsive, and more adventurous than girls, they take more risks and consequently have more accidents requiring medical treatment. Thus, fathers may play a particularly important protective role with respect to boys.

Some authors [including Frascarolo, 1997 and Ross & Herzog, 1985] have asked whether the physical play of fathers, at least with their sons, might be the expression of a certain form of rivalry on the part of fathers toward their sons. The fact that fathers succeed more easily than mothers in obtaining obedience from their sons [Lytton, 1979] may be due in part to a relationship of dominance established through RTP.

According to scientific literature, mothers are more likely than fathers to allow toddlers to lead, while fathers have repeatedly been found to encourage stereotypic gender-appropriate play in both sexes [Jacklin, DiPietro & Maccoby, 1984], and have a greater tendency to be more directive during both physical and pretend play, especially with sons [Farver & Wimbari, 1995; Kazura, 2000]. In fact, father-child RTP seems to include the two main dimensions of parental behavior: warmth and control. Warmth and control are linked to optimal child development [see Hofferth et al., 2002]. In quality RTP, the father can in fact communicate a double message

to his child: 'I love you' (affective component) and 'I am stronger than you' (agonistic component). Consequently, quality father-child RTP should include at least two characteristics: it should be highly pleasurable for the child, and should involve the use of moderate control on the father's part. For example, in RTP, the father must be sensitive to the child's emotional state and permit a reciprocal exchange of 'dominant' and 'subordinate' roles, i.e. regularly allow the child the pleasure of being on top. In nonhuman primates, the rare males who engage in RTP with youngsters allow the younger primates to be on top, which increases the latter's self-confidence while also making them want to play again another time [Biben & Suomi, 1993]. If, due to a lack of sensitivity, the father does not adjust his level of control, the child will sense coercion and find the interaction highly disagreeable, which will result in the termination of play. Results from Paquette et al. [2000] have shown that physical play occurs less frequently with authoritarian fathers, i.e. those who tend not to be very affectionate and who frequently use control (even physical punishment) to obtain obedience and respect for authority. Contrary to Lindsey [1997], I would suggest that it is important that the father regularly allow his child to be on top, but not to have an equal share of power. In order to maintain dominance and facilitate discipline, the father must let the child know that, in any case, the father is still stronger than the child. In short, quality father-child physical play can be expected to be indicative of sensitive paternal discipline and to facilitate obedience in children, especially boys.

Father-Child RTP and Child Aggression and Competition

Parents often consider RTP to be a form of aggression that must be discouraged in children to avoid the development of social problems [see Hughes, 1999]. On the contrary, RTP is an important source of learning for children. Children who have had more positive interactions with their fathers at age 3 have been shown to interact more positively with peers 2 years later [Youngblade & Belsky, 1992]. Parents' playing styles may influence their children's ability to recognize and regulate emotions and/or may foster their children's sense of self-efficacy, which in turn may promote more positive interaction with peers. Some evidence suggests that variations in the ability to encode and decode signals may be linked to parent-child play [Parke, MacDonald, Beitel & Bhavnagri, 1988], and that children who experience greater difficulty in decoding emotions are less willing to engage in RTP with peers [Pellegrini & Smith, 1998]. Father-child play may foster the development of the ability to decode other people's emotional states and to clearly encode one's own emotional signals [Carson et al., 1993]. The children of fathers who exhibit high levels of physical play with boys and girls 3-4 years old and elicit high levels of positive feelings during play sessions receive the highest peer popularity ratings [MacDonald & Parke, 1984]. Recent work suggests that fathers play a much larger role than mothers in the socialization of children's emotions, especially in anger regulation [see Parke et al., 2002].

MacDonald [1993] emphasizes the importance of seeing the capacity for parent-child play as a developmental universal. On the one hand, due to their experience, parents are a very rich source of stimulation; they are in a better position than siblings to facilitate more mature and varied play [Baskett & Johnson, 1982]. On

the other hand, early parent-child play may influence later peer play [Carson et al., 1993]. For example, parents who use more directive and coercive play engagement techniques have unpopular children who also tend to use more directive and physically coercive initiating styles in their play with peers [see Kerns & Barth, 1995].

Many researchers have related paternal absence [Furstenburg, Morgan & Allison, 1987] as well as poor quality father-child relationships [Johnson, 1987] to the well-known higher incidence of conduct problems (including aggression) among boys. The higher rate of aggression in boys can be explained in part by a lack of parental supervision [Goldstein, 1984]. It may also be explained by learning that has not taken place. Ross and Herzog [1985] have postulated that play has a role in the organization of aggressive impulses. Fathers teach children, particularly boys, to modulate and contain their aggressive behaviors through RTP [Herzog, 1982], at least between infancy and the age of six [see Simmons, 1991]. As paternal parenting tends to be disruptive, in contrast to maternal parenting which is more soothing, fathers help their children learn to modulate intense affect by increasing the intensity level of RTP and then reducing it when it exceeds what their children can tolerate. Both mothers and fathers play roles in stimulating and inhibiting nascent aggressiveness, but in the second half of their children's second year, fathers becomes more clearly associated with its activation [see Simmons, 1991]. We would therefore expect a negative correlation between the quality of father-child RTP and the frequency of peer aggression in children (especially boys).

Fathers must avoid over- or under-stimulating their children. Families in which children are entirely responsible for the structure of play may reflect an undercontrol of offspring, whereas families in which parents decide the type and content of play regardless of their children's input may reflect a certain parental authoritarianism [Levine, 1988]. It is known that authoritarian parents (more control, less affection) have children who are more likely to be insecure, submissive, power-oriented in their personal relationships, and obedient to authority figures [Peretti & Statum, 1984]. On the other hand, children of neglectful parents (less control, less affection) tend to become extremely hostile and rebellious adolescents who are prone to antisocial or delinquent acts [Patterson, DeBaryshe & Ramsey, 1989]. It has been demonstrated that young monkeys lacking adequate experience in being dominant during RTP may lack assertiveness in their later social interactions, or may avoid interactions [Biben & Suomi, 1993]. Furthermore, studies show that parents of popular children engage in more physical play with their sons than parents of rejected or neglected children [MacDonald, 1987].

To date, research has presented the attachment relationship as a mechanism for the intergenerational mother-child transmission of a sense of security, fostering the development of social competencies (sociability, popularity, positive social orientation, etc.). However, the competencies that have been shown to be associated with secure mother-child attachment are primarily concerned with cooperation and sharing abilities. The few studies that have been able to demonstrate an association between mother-child attachment and conduct or aggression problems have done so only in boys [Lewis, Feiring, McGuffog & Jaskir, 1984; Renken et al., 1989]. According to Carson et al. [1993], early father-child RTP may be important in the regulation of agonistic and aggressive interactions. It is important that we now study the father-child activation relationship as a mechanism for the transmission of self-confidence enabling children to develop another type of social competencies:

competition skills. Here, we understand competition skills to include not only physical fighting skills, but also and especially those psychological attributes that permit individuals to defend themselves, to face adversity and environmental threats, a level of self-esteem that enables individuals to confront others when it is necessary to fight for their rights. Some researchers have undertaken the study of conflict and the ontogenesis of aggression but, as far as is known, none of them has tried to understand the development of competition skills in preschool children, i.e. how youngsters acquire the ability to deal with conflict and defend their ideas in a socialized manner without resorting to aggression or avoiding problematic situations that it may not always be possible to resolve through cooperation and sharing. The lack of research in this area is perhaps due to the fact that competition is generally considered to be just as socially inadequate as aggression. Studies of animals deprived of the opportunity to engage in RTP have shown that such they seem to have difficulty becoming successfully aggressive as adults, i.e. they do not seem to know how or when to defend themselves against attack, they perceive threats when there are none, and do not perceive any when they should [see Hughes, 1999]. However, as Hughes stated [1999], competitive play can help prepare children for the necessary competition of the adult world.

The two mechanisms – attachment via a caregiving context and attachment via a physical play context – would appear to be complementary thus ensuring the optimal adaptation of humans to a very complex social environment. The progressive increase in the complexity of social life over the course of primate evolution made it necessary to find a balance between competition and cooperation. Individuals who were always in a competitive mode would eventually become socially isolated, which would prevent them from experiencing the advantages of a social life. On the other hand, individuals who had only developed cooperation skills would not know how to defend and assert themselves in the numerous competitive situations they would routinely encounter. As we have seen in a previous section, the presence of a father and mother with differentiated roles fosters the development of both competition and cooperation skills [Bourçois, 1997; Le Camus et al., 1989].

With father-child RTP having been studied mostly in families from industrialized countries, particularly in North America and Europe, some researchers have sought to verify the universality of such play in humans. Studies of Aka pygmies (Central African Republic), Chinese, Malaysian, and Indian families have shown an absence or low frequency of parent-child physical play [Roopnarine, Ahmeduzaman, Hossain & Riegraf, 1992]. Fathers do not engage in more physical play with their children than mothers, and indeed they participate in other kinds of play such as object-mediated play just as much as mothers, while children appear to be attached to both their mothers and their fathers [Roopnarine et al., 1992]. These results caused Roopnarine et al. [1992] to reconsider the biological origin of rough play. Given the great plasticity of human behavior, intercultural stability cannot be considered to be the basic criterion for deciding whether physical father-child play is of biological origin or not. In all cultures, parents behave towards their children in such a fashion as to ensure that the latter develop the necessary abilities to adapt and survive [see LeVine, 1970]. It is interesting to note that the three above-mentioned societies value sharing and cooperation, whereas industrialized societies are characterized by a high degree of competition, and value independence and assertiveness. Cultures that are affluent, technologically advanced, and highly com-

plex are likely to have the highest levels of competition in their children's play [see Hughes, 1999]. In the United States, individualism has been purported to be valued over collectivism, and it has been theorized that children tend to be competitive as a group as compared to children from other cultures [see Hughes, 1999]. However, North American children raised in communal settings, in which there is an emphasis on group ownership of property, and on group rather than individual achievements, rarely participate in competitive play [Plattner & Minturn, 1975]. The case of the Aka society is particularly interesting. Aka fathers spend considerable time (more than 50% of a 24-hour period) holding their babies, providing affection, and engaging in face-to-face play. Children are very attached to their fathers, despite the fact that they do not engage in RTP with them [Hewlett, 2000]. In fact, one might hypothesize that young Aka children, and particularly boys, tend to initiate RTP with adults and other children, but that this kind of play is discouraged by the parents. For these fathers, it would certainly be appropriate to use the SSP to evaluate the father-child attachment relationship.

Conclusion

This article suggests that children may develop their attachment to mothers and fathers via different dimensions of parenting, that the development of different types of social competencies (cooperation versus competition) is linked to the various dimensions of parenting (caregiving, make-believe, physical play), whether performed by the father or the mother, but that mothers and fathers generally have a tendency to interact differently with their children, in a manner complementary to one another. It is therefore essential that we take into account both the father-child relationship and the mother-child relationship, as well as the parents' daily involvement in the different parental roles (primary caregiver versus primary playmate) if we wish to better predict the development of psychopathologies in children, particularly the development of aggressive profiles.

If research into the father-child relationship is still in its preliminary phase, this is probably because researchers applied theoretical models and methods developed for mothers to fathers. It is difficult to develop theories specific to father for at least two reasons. The first is related to the struggle for equal rights for men and women. The identity differences between men and women discussed in this article could unfortunately be used to justify inequalities or the often-criticized traditional division of parental roles. I would hope that we would be able both to respect our mutual differences with respect to forms of interaction with children, as those differences are a significant asset for them, and to establish an egalitarian division of labor. The second reason is the importance to innovation of setting aside mother-child theorization while still retaining the precious contributions it has made.

Thus, this article has sought to explore the application of Bowlby's attachment theory to fathers by examining roles that may be specific to fathers. Our examination of the current understanding of parental involvement in nonhuman male primates, and of human-specific adaptations led to the hypothesis that the indirect parental contribution of men may have originated from an increased need for parental care over the course of our phylogenetic history. Further, the comparison of

mother-child and father-child interactions in Western industrialized societies suggests that fathers play a particularly important role in the development of children's openness to the outside world and their autonomy. Men seem to have a tendency to surprise children, to destabilize them momentarily, and to encourage them take 'risks,' thus enabling children to learn to be brave in unfamiliar situations and to stand up for themselves. Children seem to need to be stimulated and motivated as much as they need to be calmed and secured, and they receive such stimulation primarily from men, primarily through physical play. But this dynamic can only be effective in the context of the emotional bond between father and child that I have called the 'activation relationship.' Finally, it is important that we now consider the possibility that physical father-child play may have positive effects on the adaptation of children to their environment, rather than considering it simply to be a distraction with no developmental consequences that puts children at risk of injury. We submit that in the short term, quality father-child RTP encourages obedience on the part of children, while in long term, it permits children to develop competition skills, i.e. the ability to deal with and resolve conflict situations with peers in a socialized manner without either resorting to the use of aggression or avoiding situations that cannot always be resolved through cooperation and sharing, skills which are especially vital in highly-competitive industrialized societies like our own. This would be of particular importance for boys, who tend to be more impulsive and more aggressive than girls.

The sexual dimorphism favoring males found in the human species indicates that, in earlier stages of human phylogenetic history, males had to compete for access to sexual partners, and females chose the more dominant males in order to transmit to their children traits that would facilitate their survival and reproduction [see Geary, 2000]. However, the decrease in sexual dimorphism suggests that competition among females for access to food and the greater vulnerability and dependency of infants led females to choose male providers. Furthermore, males became directly involved with boys by assuming responsibility for opening them to the world so that they could develop the skills necessary for fighting, hunting and exploring the territory for resources, skills that would be vital in adulthood to ensure the survival of their own children.

In short, the father-child activation relationship would appear to help children be braver when they encounter new experiences, which may later enable them to overcome obstacles to their personal success (and ultimately to their survival and reproductive success). Fathers appear to play an important role in the development of their sons' desire to succeed [Yarrow et al., 1984]. The question now is to know whether the differentiated modes of parent-child interaction of men and women are still adaptive for children of today. The greater frequency of father-child RTP in the most highly industrialized societies indicates the need of children to adapt to an extremely competitive world. The children who obtain the most varied resources will be those who adapt best. The involvement of the father as both provider and initiator of the child's opening to the world are undoubtedly considerable assets. Given the ever-increasing presence of women in the workplace, girls may benefit greatly from interactions during their childhood with father figures who open them to the world. The extent to which parents who plays dual maternal and paternal roles can effectively mediate the optimal adaptation of their children to their environment remains to be determined.

As fascinating as it may be to study cognition, the trait that plays the greatest role in differentiating humans from other animals, we must not underestimate the importance of phylogenetically ancient mechanisms such as RTP if we wish to develop a better understanding of the socio-affective development of children. Furthermore, it seems important to go beyond the traditional cognitive/socio-affective division to study the links between cognition and affect within the father-child activation relationship itself.

It is vital that more research be conducted in a non object-mediated play context, as per Kerns and Barth [1995]. It should then be possible to determine the characteristics of paternal sensitivity (such as directiveness and agreeableness), and later perhaps to develop a method for evaluating the quality of the father-child activation relationship, as has been done by Ainsworth and Wittig [1969] for the mother-child attachment relationship. It is also imperative that the relation between the quest for autonomy that begins in the second year of a child's life and the activation relationship be explored. This would require more research into the father-child relationship during the preschool period, as most studies to date have focused on infants [Levine, 1988].

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