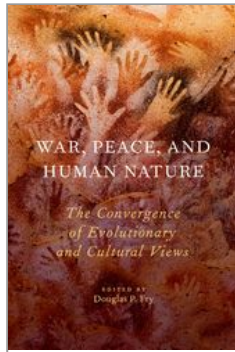


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## War, Peace, and Human Nature: The Convergence of Evolutionary and Cultural Views

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# Conflict Resolution in Nonhuman Primates and Human Children

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## Abstract and Keywords

Aggressive behavior in childhood poses a threat to society, since aggression tends to be quite stable in childhood, and aggressive children often become violent adults. One important prosocial mechanism to reduce the negative impact of aggression is reconciliation, which can be defined as friendly behavior between former opponents shortly after a conflict. This chapter stresses the importance of adequate reconciliation in keeping conflicts manageable and functional. Understanding the factors that influence reconciliation is essential to improve conflict management in children with and without disruptive behavior problems. Much knowledge on conflict management comes from animal studies. The chapter first presents the key results derived from animal studies before considering what is known about reconciliation, both in typically developing children and in those with aggressive behavior problems. Second, it highlights the importance of the social environment for the development of reconciliatory skills in both nonhuman primates and human children. Third, it discusses factors that may contribute to the ability to develop and effectively execute reconciliatory skills.

*Keywords:* aggression, aggressive behavior, conflict management, prosocial behavior, reconciliation, reconciliatory skills

Aggressive behavior in childhood poses a threat to society, since aggression tends to be quite stable in childhood, and aggressive children often become violent adults (Tremblay, 2000). Aggression has various negative effects, that is, apart from eventual wounds and damaged property, it results in postconflict stress and harms relationships. Aggression is especially harmful when it escalates. Therefore, most studies focus on the initiation and prevention of aggression in conflicts between children. This is remarkable, since conflicts of interest and the resulting aggression are integral parts of adaptive human functioning and are inevitable as individuals protect their interests.

Consequently, rather than only pursuing the prevention of aggression, it may also be important to study how prosocial skills reduce the negative effects of aggressive conflicts and prevent further escalation. One important prosocial mechanism to reduce the negative impact of aggression is reconciliation, which can be defined as friendly behavior between former opponents shortly after a conflict.

This chapter stresses the importance of adequate reconciliation in keeping conflicts manageable and functional. Understanding the factors that influence reconciliation is essential to improve conflict management in children with and without disruptive behavior problems. Much knowledge on conflict management comes from animal studies (Aureli & de Waal, 2000). Therefore, we first mention the key results derived from animal studies before considering what is known about reconciliation both in typically developing children and in those with aggressive behavior problems. Second, we highlight the importance of the social environment for the development of reconciliatory skills in both nonhuman primates and human children. Third, we discuss factors that may contribute to the ability to develop and effectively execute reconciliatory skills. **(p.440)**

### Aggression and Reconciliation

Animal studies on conflict management show that reconciliation is a prominent way to repair damage caused by aggressive conflicts (Aureli & de Waal, 2000). In the short term, reconciliation may serve to reduce postconflict stress and prevent renewed aggression (Aureli, Cords & van Schaik, 2002; Aureli & van Schaik, 1991). The long-term function is to restore relationships that have been disturbed by aggression. In nonhuman primates this is expressed in a higher reconciliation tendency directed toward valuable partners (friends and kin) compared to less valuable partners (nonfriends and non-kin) (Aureli, 1997; Call, 1999; Call, Judge & de Waal, 1996; Castles, Aureli & de Waal, 1996; Cords & Turnheer, 1993; Koski, De Vries, Van Den Tweel & Sterck, 2007).

Although the body of research in children is less extensive, several studies in typically developing children demonstrated reconciliatory skills as early as three years of age (Butovskaya & Kozintsev, 1999; Fujisawa, Kutsukake & Hasegawa, 2005; Ljungberg, Horowitz, Jansson, Westlund & Clarke, 2005). In line with evidence in animals, reconciliation in children diminished renewed attacks (Ljungberg, Westlund & Forsberg, 1999) and decreased the frequency of redirected aggression (Butovskaya & Kozintsev, 1999). Furthermore, after an aggressive act stress-related behaviors were elevated, but these were reduced after subsequent reconciliation (Fujisawa et al., 2005). Moreover, reconciliation promoted tolerance between former opponents (Butovskaya & Kozintsev, 1999; Fujisawa et al., 2005; Ljungberg et al., 2005). These findings stress the importance of reconciliation to reduce the negative consequences of aggression in children in general. Surprisingly, little attention has been paid to reconciliatory behavior of children for whom reconciliation may be most important, that is, children with disruptive behavior problems.

Traditionally, psychologists, social scientists, and welfare biologists have presented aggression as an antisocial behavior. However, aggressive behavior, defined as behavior aimed at causing physical injury or threat displays that warn of impending actions (Aureli & de Waal, 2000), can actually be a useful component in the behavioral repertoire of a given species, including among developing human children. Individuals that live in a social group need to communicate their relative positions and find solutions for potential conflicts to successfully cooperate in action or exchange services and favours. Aggression, and specifically the threat of aggression, can be a powerful tool in the bargaining process between partners. Nonetheless, a child's antisocial behaviors sometimes form a pattern that goes beyond the bounds of normal aggression and becomes deviant. When aggressive behavior is disproportionately severe, frequent, and has obvious unfavorable effects on a child's functioning at home and at school, the child is diagnosed with a disruptive behavior disorder (American Psychological Association, 2000). To give these children the most adequate treatment it is necessary to better understand not only aggression but also its mechanism of control.

Most researchers studying children with aggressive behavior problems concentrate on deviances in the aggressive behavior itself or on the factors that may elicit aggressive (p.441) behavior. However, studies that observe the behavior of children with aggressive behavior problems in conflict situations report either no differences (Kempes, Orobio de Castro, & Sterck, 2008; Matthys, de Vries et al., 1995) or relatively small (Kempes, de Vries, Matthys, van Engeland, & van Hooff, 2008; Matthys, de Vries et al., 1995) differences in the rate of aggressive behavior compared to typically developing children. Yet, it was found that among children with aggressive behavior problems, aggressive conflicts started earlier, lasted longer, and escalated more often in impermissibly severe aggression (Kempes, Orobio de Castro, & Sterck, 2008). This suggests that not the incidence of aggression itself, but the incidence of excessive or escalated aggression forms the crucial determinant in their aggressive behavior problems. The maladaptive nature of conflicts of these children may thus in part result from an inability to limit the negative consequences of their aggression. In line with this notion, it was found that children with disruptive behavior problems find it difficult to neutralize incipient conflicts (Matthys, de Vries, et al., 1995) and to recognize benign behavior when they are frustrated (Orobio de Castro, Bosch, Veerman, & Koops, 2003). These findings may point to deficiencies in understanding and interpreting the prosocial behavior of the peer and generating prosocial behavior in an aggressive context, capacities that may be prerequisites of reconciliation. In addition, children with disruptive behavior problems are often unsuccessful in establishing friendships with non-aggressive peers (Coie, Dodge, Terry, & Wright, 1991). This has been attributed to their higher frequency of inappropriate behaviors such as aggression and teasing (Hektner, August, & Realmuto, 2000). Since reconciliation plays an important role in restoring the relationships after a conflict in typically developing children (Fujisawa et al., 2005), it is also possible that children with disruptive behavior problems lack the ability to reconcile their conflicts and consequently have difficulty maintaining prosocial relationships. Findings of a study we recently performed corroborate the prediction that children with aggressive behavior problems are unable to reconcile. More specifically, we showed that the absence of reconciliation in these children was not due to a lack of initiation of postconflict affiliation, but because postconflict affiliative offers from peers were rejected. In addition, we found that postconflict affiliative offers from peers did not prevent the renewal of aggression (Kempes, Orobio de Castro, et al., 2008). This suggests that the ability to mitigate the effects of aggression is crucial for appropriate social functioning.

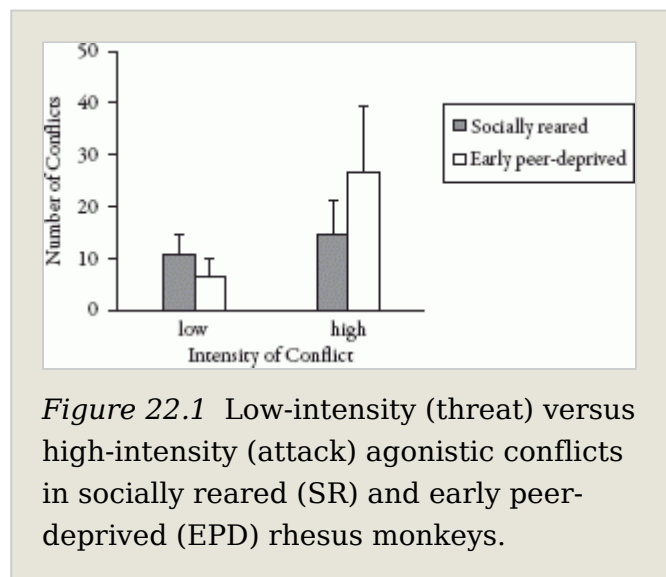
### The Learning Environment

In humans the social environment has a powerful influence on the development of social behavior, and an adverse early environment may cause psychopathology, such as aggressive behavior problems. The above-described results raise questions about the development of aggressive behavior and reconciliatory skills. As noted earlier, children are already able to reconcile at the age of three. As they grow older they resolve their conflicts more frequently (e.g., Fujisawa, Kutsukake, & Hasegawa, 2006; Laursen & Hartup, 1989; Verbeek & de Waal, 2001), and around the age of five they steeply increase their tendency to reconcile **(p.442)** (Fujisawa et al., 2006). Several theories have been formulated concerning the way children acquire conflict resolution skills. Some attribute the early development of conflict resolution to socialization processes, whereby adults use facilitative strategies to intervene on children's peer conflicts and model constructive means of resolution (Bayer, Whaley, & May, 1995; De Vries & Zan, 1994; Katz & McClellan, 1997; Perlman & Ross, 1997). Others suggest that children's conflict resolution abilities may also emerge naturally out of children's interactions with others, especially with peers (Killen & de Waal, 2000; Killen & Smetana, 2006; Piaget, 1932). Since rearing conditions are variable in humans, some additional insights can be gleaned from the controlled studies of nonhuman primates. Rhesus monkeys (*Macaca mullata*), like humans, grow up in an environment consisting of complex social networks and often have served as a model for the effects of rearing conditions on social behavior.

Since reconciliation is thought to be a social skill that primates acquire during their relatively long period of infancy and juvenescence (de Waal & Johanowicz, 1993), it has been suggested that social learning during ontogeny is of crucial importance for the development of adequate reconciliation (Ljungberg & Westlund, 2000). How social learning processes can positively influence reconciliatory tendencies was shown in an experiment by de Waal and Johanowicz (1993), wherein juvenile rhesus macaques were placed together with juvenile stumptailed macaques (*Macaca arctoides*). Previously, stumptailed macaques had been found to reconcile a much larger proportion of their conflicts than rhesus monkeys. In the de Waal and Johanowicz experiment, compared to their baseline level of reconciliation, the juvenile rhesus monkeys showed a threefold increase in the proportion of reconciled conflicts after being exposed to greater reconciliatory tendencies of stumptailed macaques over a five-month period. These findings stress the importance of the social environment in the development of reconciliatory tendencies, especially since a similar group of juvenile rhesus monkeys, cohoused with other rhesus monkeys for a similar period of time, did not show any sign of an increase in reconciliatory behaviors.

In the de Waal and Johanowicz (1993) experiment, the environment of the rhesus monkeys was “enriched” with stump-tailed tutors that were experienced in reconciliation. While this situation seems to enhance social competence, social deprivation during the juvenile period has been linked not only to several social inadequacies in peer interactions (Harlow & Harlow, 1962), infant-mother interactions (Hinde, 1966), maternal behavior (Suomi, 1978), and sexual behavior (e.g., Harlow & Harlow, 1962; Mason, 1960), but also to aggressive behavior (Kraemer, 1992; Mineka & Suomi, 1978; Mitchell, Raymond, Ruppenthal, & Harlow, 1966). Concerning aggressive behavior, it was shown that early peer deprivation did not affect the rate of aggressive behavior (Kempes, Gulickx, van Daalen, Louwerse & Sterck, 2008). However, it does affect the intensity of the aggressive behavior. It was found that early peer-deprived rhesus monkeys compared to socially-reared rhesus monkeys showed higher rates of conflicts with high intensity aggression, but not higher rates of low intensity aggression (Figure 22.1). Moreover, whereas socially-reared rhesus **(p.443)**

monkeys show equal amounts of low- and high-intensity aggression, early peer-deprived rhesus monkeys show significantly more high-intensity aggression. Moreover, aggression in groups of socially-deprived monkeys could escalate to the point that animals were seriously wounded or killed, necessitating repeated regroupings and movements of animals between groups (Kempes, Gulickx, et al., 2008; Ljungberg & Westlund, 2000). The aggressive behavior of early peer-deprived rhesus monkeys, therefore, seems to show a resemblance to the aggressive behavior of children with aggressive behavior problems. This raises the question whether social deprivation in rhesus monkeys also hampers reconciliatory skills.



In concordance with this hypothesis, it was found that socially-deprived rhesus monkeys do not show reconciliation behavior with their opponent after a conflict (Kempes, Den Heijer, Korteweg, Louwerse, & Sterck, 2009; Ljungberg & Westlund, 2000). In addition, in correspondence with the findings for children with aggressive behavior problems, it was found that the lack of reconciliation was not due to an inability to show postconflict reconciliatory attempts, but due to rejection of reconciliatory attempts by the former opponent (Kempes et al., 2009). In sum, these results suggest that the environment plays an important role in the development of both reconciliatory skills and functional aggressive behavior.

### Capacities for Reconciliation

The foregoing results emphasize the importance of contact with group members early in life for the development of adequate reconciliation. It is hypothesized that attachment relationships may play an important role in the development of reconciliation (Weaver & de Waal, 2003). In human and nonhuman primates, early attachment experiences strongly affect the development of skills and the nature of relationships with others (Ainsworth, Blehar, & Waters, 1978; Bowlby 1969). According to the attachment theory of Bowlby, infants become attached to adults who are sensitive and responsive in social interactions with them, and begin to use such caretakers as a secure base from which to explore the (p. 444) immediate environment. At first, parental responses lead to the development of patterns of attachment. These, in turn, lead to internal working models which will guide the individual's perceptions, emotions, thoughts, and expectations in later relationships (Bowlby, 1969). Since children with poor early attachment relationships with their mother are more likely to show aggressive behavior patterns when they are of school age (Lyons-Ruth, 1996), it may be that reconciliation is also affected by the nature of attachment between the mother and infant.

Previous research in captive brown capuchins (*Cebus apella*) showed that the quality of relationship between the mother and offspring affected the behavior that was involved in reconciliations of their offspring (Weaver & de Waal, 2003). Weaver and de Waal (2003) hypothesize that consistent amiability within mother-offspring relationships provides secure youngsters with a better developed neurobiological (Kraemer, 1992) and psychological (Bowlby, 1969) makeup. However, although the relationship between mother and infant is important, our research with rhesus monkeys shows that the influence of contact with peers on the development of reconciliatory behavior must not be neglected.

In naturalistic settings rhesus monkeys spend their first month in intimate physical contact with their biological mother, in which an enduring attachment bond is established. However, already in their second month rhesus infants begin to explore their immediate physical and social environment, using the mother as a secure base. Throughout the rest of their childhood most juveniles spend several hours each day in active social play with peers. During the course of peer play most social behavior necessary for normal adult functioning is developed and practiced (Suomi, 2005). Recall that rhesus monkeys that were deprived of peer interaction in the first year of life did not engage in reconciliation. Therefore, the presence of peers seems to be as important as the presence of the mother for the development of reconciliation and social skills.

With respect to the influence peers may have on the development of reconciliation, we tested three hypotheses (Kempes et. al., 2009). The first hypothesis was that the absence of peers early in life may have prevented rhesus monkeys from forming valuable relationships. These monkeys may have lacked valuable relationships that needed to be restored after a conflict. However, this hypothesis was rejected since early peer-deprived rhesus monkeys did show higher affiliation rates toward friends compared to non-friends, which indicates that they actually do have valuable social relationships with other monkeys.

Secondly, we hypothesized that early peer-deprived rhesus monkeys may not have been exposed to conflict management strategies while immature. This may have resulted in an inability to invite reconciliation, shift from aggressive to affiliative behavior (Aureli et al., 2002) or interpret reconciliatory behavior correctly (Kempes, Orobio, et. al., 2008). Our results (Kempes, Gulickx, et al., 2008) show that the lack of reconciliation was not due to a lack of initiation of reconciliation, and additionally, since early peer-deprived rhesus monkeys did show third-party affiliation, we concluded that they were able to shift from aggressive to affiliative behavior. However, we found some evidence that these peer-deprived monkeys had trouble interpreting social signals of other monkeys. Kempes, **(p.445)** Gulickx, et al. (2008) showed that early peer-deprived monkeys react with aggression to social submission signals, that is, bare teeth, from peers. Socially-reared animals, on the other hand, react to bare teeth with inhibition of aggressive behavior. This suggests that early peer-deprived monkeys neglect or misinterpreted positive facial cues, which might explain why they did not accept reconciliatory gestures of a peer.



The third hypothesis was related to attachment theory. We hypothesized that the absence of peers in early life may have not provided rhesus monkeys with the opportunity to socially interact with others while using their mother as a secure base. This would result in anxious behavior that may have prevented them from accepting reconciliatory behavior. In accordance with this hypothesis, we found that early peer-deprived monkeys avoided their peers more often than socially-reared monkeys in both the postconflict period and a matched control period 24 hours later (Kempes et al., 2009). In addition, it was found that early peer-deprived victims rejected reconciliatory offers from their rivals. Finally, the third hypothesis gains support from the finding that early peer-deprived monkeys in general have high anxiety levels (Kempes, Gulickx, et al., 2008). These results indicate that approaches are considered threatening and rejection of reconciliatory offers is caused by a high anxiety level in the peer group resulting in the absence of reconciliation.

In sum, the absence of peers in early life seems to have resulted in a higher anxiety level and a greater focus on negative social cues than occurs in socially-reared monkeys. This absence of peer contact in early life subsequently may result in both the rejection of reconciliatory offers and the presence of deviant aggressive behavior observed in the peer-deprived rhesus monkeys. The ability to socially interact with peers from the secure base of the mother—in other words, the normal social pattern among a group-living species of primate such as rhesus monkeys—seems to reduce anxiety levels and allow the recognition of the social signals necessary for adequate reconciliation and species-typical, aggressive behavior.

### Conclusion

Altogether, reconciliation, friendly behavior between former opponents, is an important way to reduce the negative impact of an aggressive event and functions to maintain good social relationships in nonhuman primates and human children alike. Children with aggressive behavior problems show escalated aggression and fail to reconcile. This leads to our proposal that not only the initiation and rate of aggression, but also their failure to control escalation and to show reconciliation are crucial components of their aggressive behavior problems. This interpretation is strengthened by the finding that rhesus monkeys who show deviant aggressive behavior also fail to reconcile.

With respect to the learning of reconciliatory skills we conclude that the presence of peers in early life is essential for the development of functional aggressive behavior and adequate reconciliation behavior. We propose that the ability to socially interact with **(p.446)** peers from the secure base of the mother is essential for learning how to regulate anxiety levels and for recognizing reconciliatory social signals from other monkeys. In this way socially-reared monkeys naturally learn how to employ restrained aggression, which results in less serious injuries than does higher intensity fighting, and they also learn how to resume normal interactions with their peers following an aggressive episode.

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