

# Reconciliation and Peace-Making: Insights from Studies on Nonhuman Animals

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## Abstract

Conflict resolution is the part and parcel of living in groups. In social circumstances competition over limited resources is inevitable. For individuals to benefit from group living, the costs should not disrupt social cohesion or relationships. Animals use many ways to avoid conflicts and to mitigate their damage. Post-conflict reconciliation is an effective way to reduce emotional stress after aggression and to repair the damaged relationship between the former opponents. We now know that reconciliation is common in social species with individualized relationships. The necessity to reconcile is higher when individuals fight with someone who provides them with valuable benefits. Also, general benevolence between individuals reduces the risk to reconcile, increasing thus its likelihood. There are also preventive mechanisms to avoid costly conflicts, and ways to prevent its escalation once started. In many species, bystanders interact with conflict participants when aggression is over, often with affiliative behavior. Such "bystander affiliation" serves many functions, some of which may be cognitively demanding and resemble human consolation or mediating. However, we still know little of the cognitive and emotional mechanisms of animal conflict resolution. Understanding the mechanisms of behavior is the next step in animal conflict resolution research. It will help illuminate the mysterious minds of social animals and, ultimately, the evolutionary history of human peacekeeping.

## INTRODUCTION

We humans resolve conflicts and keep peace in various ways almost daily. Peacekeeping is not only about international peace treaties mitigated by the United Nations, or court decisions based on formalized rules. It is also about saying "sorry" after a careless comment, a handshake over the picket fence after a dispute, and a joke to ease tension when a conversation is heating up. Daily behaviors are part of our conflict management behavior just as much, or even more so, than institutionalized litigation. These behaviors have deep natural roots. There are various ways of peacekeeping in nonhuman animals,

ranging from prevention of conflicts to limitation of their escalation by mediation or policing, and post-conflict reconciliation. Conflict management in animals has helped us understand the evolutionary fundament of our conflict management, and shown us that peace and conflict resolution are natural phenomena.

### FOUNDATIONAL RESEARCH

The fundamental principle of living in groups is the need to balance the benefits of gregariousness with its costs. Traditionally, research focused on aggression as the unavoidable outcome of competition. However, the last three decades have taught us that aggression is often avoidable, and when it is not, damage can be alleviated.

Group living provides many benefits from increased protection from predators to cooperation in offspring care and self-maintenance. The costs, in turn, stem from increased competition over food, mates, or coordination of movement. Competition instigates conflicts of interest. However, conflicts can cost time and energy, cause injuries, and disrupt group cohesion and relationships therein. Peacekeeping mechanisms keep the costs and benefits in balance.

The mechanisms can be categorized as conflict prevention, control of the damage during conflict, and alleviation of the damage afterwards. First, when a conflict of interest arises between individuals, they may avoid confrontation. Animals go a long way to avoid costly aggression, for example, by forming behavioral rules based on dominance hierarchy. They can also increase affiliative behavior at times of increased competition to buffer tension, or show respect of possession. Or, individuals can simply avoid each other. Avoidance can become a permanent feature of a species social system, so that individuals respond flexibly to the degree of competition by spatial dissociation. For example, primates that live in groups with a flexible degree of spatial cohesion (i.e., so-called “fission-fusion” sociality) avoid aggression by moving in smaller parties when competition is increased.

Should a conflict escalate into physical aggression, the participants can control the damage. Individuals may use supporting partners to stop the aggression by overpowering the opponent. Regular coalition partners may form a long-term alliance, often seen between related individuals or breeding partners. Finally, damage control is common in the aftermath of aggression by reconciliation.

### RECONCILING CONFLICTS

Reconciliation, that is, friendly post-conflict interaction between the former combatants soon after a conflict, has been demonstrated in over 30 species of primates, as well as in bottlenose dolphins, horses, goats, spotted hyenas,

dogs, wolves, and cleaner wrasse fish. In fact, it is shown in nearly every species that lives in durable social units with individualized relationships as characterized by repeated interactions among group members. Functionally, reconciliation effectively mitigates the damage done by a conflict both at the proximate level and at the ultimate, adaptive function level.

Reconciliation reduces distress experienced by the combatants. In primates, self-scratching and -grooming indicate heightened distress. The rates of scratching remain elevated for several minutes after aggression. However, if the opponents approach each other and exchange a friendly touch, vocalization, or just sit together peacefully, the scratching rate drops back to the baseline level. Thus, reconciliation has a feel-good effect. Reconciliation also reduces the snowballing of aggression. Often a victim of aggression continues to redirect aggression to a bystander, or the original conflict flares up again. Reconciliation reduces the chance of continued aggression. Finally, and most importantly, reconciliation restores the relationship back to the pre-conflict level. Aggression decreases tolerance and friendly behavior between the combatants, while reconciliation resumes the prior rate of beneficial interactions.

Most data of the patterns and functions of reconciliation come from primates. Nearly all primates live in social aggregations with individualized relationships. In recent years, the list of conciliatory non-primate species has increased to include social carnivores, marine mammals, horses, goats and cleaner fish. These studies have allowed researchers to understand the governing principles of reconciliation.

1. Reconciliation is necessary in species that live in individualized societies with in-group contest competition over resources.
2. Reconciliation is expected when a conflict damages a previously beneficial relationship, leading to the loss of the benefits.

These principles predict conflict resolution by post-conflict reconciliation among all those individuals that benefit from one another, and thus need to mitigate the damage done by aggression. The cases where reconciliation is proven to be absent, either in a species or among particular individuals of a species are those where the relationship quality between interaction partners is low.

## THE NEW DEVELOPMENTS

### THE IMPORTANCE OF RELATIONSHIP QUALITY

Social groups consist of many kinds of relationships: kinship, dominance and friendship crisscross among group members. Each individual has multiple relationships of different qualities with others. Damage due to a conflict

depends on the relative benefits the relationship confers. The relationship *value* comes from directly beneficial acts, such as grooming, food sharing or offspring care. However, value is only one aspect of relationship quality. In chimpanzees, spider monkeys, Barbary and Japanese macaques, and young ravens researchers have identified additional dimensions to relationship quality. The general benevolence and low rates of aggression describe relationship *compatibility*, while the predictability of interactions describes its *security*.

These relationship quality dimensions affect the likelihood of reconciliation differently. The more valuable the relationship, the more its restoration assures the benefits, thus increasing the need to reconcile. Compatibility, on the other hand, reduces the risk of reconciliation, thereby also increasing its likelihood. Finally, security decreases reconciliation likelihood because the damage done to the relationship by aggression is smaller in highly predictable relationships. In support of this model, reconciliation is most common among kin and friends of high value or compatibility, while it is absent if relationship security is high. For example, red-bellied tamarins are cooperative breeders, that is, the group consists of a breeding couple and their adult and subadult offspring. All individuals participate in offspring care, and the relationships are characterized by rare aggression and high rates of affective behavior among all members. Thus, the relationships among group members are high in value and compatibility. Simultaneously, however, relationships are highly secure. Predictably, reconciliation is rare or absent in this species. Conversely, chimpanzee males form friendship-like bonds of cooperation and affinity. These highly valuable and compatible relationships require keen reconciliation. In contrast, female chimpanzees have few valuable relationships with other adult females, and consequently they reconcile their conflicts less often.

The relevance of relationship quality as a conflict resolution determinant is widely accepted. The new challenge is to understand how the quality dimensions influence triadic forms of conflict resolution in various species.

#### TRIADIC AFFAIRS

Often conflicts involve more than two combatants, such as coalition partners, neutral arbitrators, and affiliative bystanders. In policing, that is, neutral intervention in a conflict, a bystander attempts to impartially control ongoing aggression. Policing stops the aggression and may thus ultimately serve to assure group stability. A recent study assessed various potential functions of this rare behavior in chimpanzees. It appears more prevalent at times of social upheaval, such as death of a central group member, immigration of new individuals or a turnover of the dominance rank. Moreover, only individuals

with a high social status have the possibility to end conflicts by neutrally intervening, and they do this without a direct self-benefit. These findings suggest that policing is a reflection of “community concern” aiming to stabilize group dynamics, rather than directly benefiting the actor.

Triadic involvement is common also after conflicts. A “third party” may, for example, reconcile on behalf of the conflict partners. If a high quality friend of one of the conflict participants engages in affiliative behavior with the other opponent, the action restores the relationship between the original combatants. Thus, a bystander is acting on behalf of its friend in reconciliation. Triadic reconciliation is now described in a few species of primates. Such behavior is remarkable, because a bystander takes the risk of approaching a recently aggressive individual, yet may not derive any direct benefit for itself from doing so.

Bystander affiliation may be given also to bystanders’ own kin or friends. This has been thus far described in chimpanzees, bonobos, gorillas, baboons, macaques, wolves, dogs, and corvid birds. In chimpanzees and bonobos, a conflict victims’ stress decreases after receiving an affiliative contact from a bystander friend. Therefore, it is hypothesized that bystander-initiated affinity is based on an empathic effort to console the target. Unfortunately, evidence of empathy rooting bystander affinity is scarce and thus far indirect. The fact that the affiliating bystanders are most often friends of the target, at least in chimpanzees, bonobos, rooks and ravens, supports the empathy explanation. It is tempting to speculate that these large-brained species have the sufficient cognitive capacity to empathise. However, consolation is just one of the functions of bystander-initiated affinity to a former combatant. Other possibilities include self-protection from further aggression, bond strengthening and, as illustrated above, “triadic” reconciliation. Such richness in the form and function of triadic affiliation poses a challenge to understand its mechanisms and determinants across species and populations.

#### KEY ISSUES FOR FUTURE RESEARCH

Above, I have summarized various forms of animal conflict resolution. The parallels to daily conflict resolution in humans are clear. Indeed, such strong similarities in human and nonhuman conciliatory and triadic resolution behavior tempt us to draw conclusions about their homologous origins. However, to truly assess the evolutionary pathways of conflict resolution, we need to understand the mechanisms. Therefore, the underpinning emotional and cognitive mechanisms are keys in the next wave of conflict management research. Not only do they provide insights into the minds

of social animals, but also they illuminate the evolutionary roots of human conflict mediation, peacemaking, friendship, and empathy.

#### MECHANISMS OF ANIMAL CONFLICT RESOLUTION

Currently, we know little of the cognitive and emotional underpinnings of conflict management in animals. Beyond basic requirements—individual recognition and memory of recent events—it is thought that reconciliation is cognitively fairly undemanding. Post-conflict distress may act as an emotional mediator mechanism, as it depends on the degree of damage done by the conflict. Better friends experience more distress after a fight, and are thus more likely to reconcile. Cognitively low requirements may partly explain its ubiquity in individualized social systems.

In contrast, the various triadic forms of conflict management may require more cognitive power. An important step in the future research is to include species with different kinds of social systems and different levels of cognitive capacity. For example, bottle-nose dolphins have a highly complex social structure, which include alliances between alliances (“super-alliances”). While dolphins are known to reconcile dyadic conflicts, it is not known whether there is conflict resolution at the super-alliance level. If so, it would demonstrate remarkable flexibility in reconciliation. At the other extreme, there is thus far no data on conflict resolution in species that have less differentiated social relationships, such as herding ungulates or seasonally gregarious birds. It is possible that for example, birds in winter flocks may engage in seasonal conflict management behavior, even if it is unnecessary during breeding season. Similarly, it is paramount that we assess conflict management in species with different brain sizes. Thus far most studies come from brainiest species in their taxa (with the cleaner wrasse as an intriguing exception). However, studying just one end of the cognitive continuum can only provide us with a partial picture of the required capacities.

The attempt to understand the mechanisms can benefit from similar research on human children. Children at pre-school age employ many similar strategies than nonhumans to resolve conflicts, without an involvement of an adult. They use various tactics from coercion to conciliatory offers, shared play, and physical affiliation. They also console, mediate and negotiate. Moreover, conflicts with friends are resolved with different behaviors than those with non-friends, although not necessarily more often. There is an age-gradient in the behavior complexity, suggesting an increasing involvement of cognition and language in later development. Interestingly, children with aggressive disorders fail to reconcile conflicts, which suggests an important role of poor emotion regulation or, alternatively, cognitive interpretation of others’ affiliative signals. Future studies should attempt to

delineate research in developmental and social psychology with that in comparative psychology and behavioral biology to further our understanding of the cognitive and emotional mechanisms in natural conflict resolution.

#### INSIGHTS FOR HUMAN EVOLUTION

The remarkable similarities in conflict resolution of humans and other primates suggest a very old evolutionary root. However, human conflict and resolution include unique complexities: We engage in multicomunity war and peace. When and why did that evolve?

Actually, humans are not the only species going to war. If war is defined as situations where coalitions of members of a group seek to inflict bodily harm on one or more members of another group, chimpanzee warfare comes at par. Chimpanzee communities live in territories that are defended against neighboring groups, which as such is very common in the animal kingdom. However, uniquely to humans and chimpanzees, males can make raids deep into the neighboring community's home range and, if they encounter the neighbors, lethal aggression may ensue. The crucial deciding factor in aggression is relative power; attacks occur only if the risk to lose is low. Strong territoriality and the fission-fusion system that creates potential for power imbalance because of varying numbers of individuals in a party create the conditions that promote lethal intercommunity aggression. These conditions are shared in chimpanzees and small-scale hunter-gatherer societies. Indeed, chimpanzee warfare resembles that of human hunter-gatherer societies in type and prevalence. The similarity suggests that the psychological adaptations that allow killing a stranger conspecific are shared among humans and our closest living relatives.

However, humans also mitigate the damage by inter-community peacemaking, while chimpanzees do not. Hunter-gatherers exhibit various forms of post-conflict mitigation both within- and between-communities. Between-community conflict mitigation is thus a derived characteristic, unique to the human lineage. Moreover, after evolving "complex" war (i.e., war of politically stratified societies that aim at subjugation and involve a hierarchical chain of command), we also began to engage in "complex" resolution. International peace treaties are far out of reach of chimpanzees and other nonhuman animals. These changes likely relate to a host of transitions during human evolution. Our hominin ancestors began to live in bigger groups, form complex bonds between groups, and have increased cognitive abilities and cumulative culture. Eventually, peacekeeping became institutionalized through centralized third-party punishment, law, and

multinational coalitionary forces. However, many aspects in this evolutionary process are still to be discovered. Future work will reveal the crucial shifts in peacekeeping during human evolution.

#### FURTHER READING

- Aureli, F., & de Waal, F. B. M. (Eds.) (2000). *Natural conflict resolution* (pp. 1–409). Berkeley: University of California Press.
- Boehm, C. (2012). Ancestral hierarchy and conflict. *Science*, *336*, 844–847.
- Fraser, O. N., & Bugnyar, T. (2010). Do ravens show consolation? Responses to distressed others. *PLoS ONE*, *5*, e10605.
- Fraser, O. N., Koski, S. E., Wittig, R. M., & Aureli, F. (2009). Why are bystanders friendly to recipients of aggression? *Communicative & Integrative Biology*, *2*, 285–291.
- Kempes, M. M., de Castro, B. O., & Sterck, E. H. M. (2008). Conflict management in 6-8-year-old aggressive Dutch boys: Do they reconcile? *Behaviour*, *145*, 1701–1722.
- Wittig, R. M., Crockford, C., Wikberg, E., Seyfarth, R. M., & Cheney, D. L. (2007). Kin-mediated reconciliation substitutes for direct reconciliation in female baboons. *Proceedings of the Royal Society, London, Series B*, *274*, 1109–1115.
- Wrangham, R. W., & Glowacki, L. (2012). Intergroup aggression in chimpanzees and war in nomadic hunter-gatherers. *Human Nature*, *23*, 5–29.

#### SONJA E. KOSKI SHORT BIOGRAPHY

**Sonja E. Koski:** Currently I am a senior post-doctoral researcher at the University of Zürich, Anthropological Institute. My research deals with the behavior and the underlying cognitive and emotional processes of nonhuman primates. My main research project at the moment concerns the evolution of primate personality, leading to the well-known human personality structure. However, I also maintain my previous research interests in primate friendship, emotions and empathy, and conflict resolution. In addition, I am always looking for alternative viewpoints, and therefore collaborate with a range of people from social, developmental, and comparative psychology, evolutionary anthropology, behavioral biology, and even linguistics. Chimpanzee conflict resolution I studied for my PhD-degree at the University of Utrecht, the Netherlands. My path has taken me from the undergraduate years as an animal physiology and ecology student at Helsinki University, through studies on vocal communication, comparative psychology and social behavior in primates in Leiden, Utrecht and Cambridge Universities, to the current interdisciplinary research on primate behavior and human evolution in Zürich. I truly believe that the most fruitful research is done at the challenging, occasionally puzzling,

but always rewarding intersection of different disciplines. *Personal web site:*  
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