A BIOLOGICAL APPROACH TO UNDERSTANDING RESISTANCE TO APOLOGY, FORGIVENESS, AND RECONCILIATION IN GROUP CONFLICT

DOUGLAS H. YARN*

GREGORY TODD JONES**

I
INTRODUCTION

In the early, heady, halcyon days of the conflict-resolution movement, the true believers asserted that all conflicts could be resolved through the persistent application of a rational, constructive mediation process. Some asserted that mediating with a divorcing couple was ultimately no different than mediating with warring factions in international disputes or internal civil unrest. That many of those making such assertions at the time had never mediated in the context of large-scale, intergroup conflict was not lost on those skeptics who had. The latter summarily dismissed the bold assertions of the former, and the field of conflict resolution has since evolved into two primary camps, one concerning itself primarily with interpersonal, dyadic disputes and the other focusing on intergroup conflicts of various scales.[1] The field is palpably divided between those who work with individuals in conflict and those who work with groups in conflict. This symposium challenges us to bridge that divide because, although the symposium's focus is on group-conflict resolution, the emotions and behaviors associated with apology, forgiveness, and reconciliation are experienced at a deeply personal and individual level.

Copyright © 2009 by Douglas H. Yarn and Gregory Todd Jones.

This Article is also available at http://www.law.duke.edu/journals/lcp.

* Professor of Law and Director, Consortium on Negotiation and Conflict Resolution, Georgia State University.

** Director of Research, Consortium on Negotiation and Conflict Resolution, and Adjunct Professor of Law, Georgia State University.

1. The former might be categorized as part of the alternative dispute resolution (ADR) movement, and the latter are more likely to identify with the peace or peacemaking movement. Of course, the development of the field is a more complex story. Indeed, many practitioners do both interpersonal and intergroup work. In addition, some practitioners who engage in intergroup work, such as those who do environmental and public-policy consensus-building or work as diplomats, are unlikely to identify themselves with the individuals and NGOs who consider themselves part of the peace movement.

This article takes up the challenge by introducing a biological approach to understanding resistance to apology, forgiveness, and reconciliation in intergroup conflict. To start with, reconciliation takes place at the level of the individual. To understand resistance to group reconciliation, one must understand why individuals resist reconciliation. In turn, one must understand how membership in the group affects individual resistance. This article first examines the behaviors that promote or discourage reconciliation. Using evolutionary biology and game theory, we illustrate how the strategic dynamics of dyadic interaction tend to favor these behaviors and derive a schema relevant to a reconciliatory cycle. We then explore how the distinct context of intra- and intergroup conflict reinforces these behaviors. Finally, we identify those barriers to individual reconciliation that result from the strategic dynamics of social-group architectures, particularly those that differ from the ancestral social architecture within which individual behavior has evolved. We conclude with a brief application of this conceptual approach to truth and reconciliation commissions.

II

WHAT IS RECONCILIATION?

Reconciliation is the Holy Grail of conflict resolution. Specifically, it refers to the restoration of a preexisting cooperative relationship after estrangement.[2] Reconciliation among those who have had a relationship is important for the simple reason that we fight more amongst ourselves than with others. That is to say, we have more conflicts within social groups[3] than between groups, and resolving those conflicts is essential for the survival of the group. Ostensibly, some benefits to be gained in the group relationship cannot be more easily gained outside of it; however, the increased interaction of individuals within a group leads to more situations in which conflict can arise. Thus, we are more likely to have disputes with our spouses, our children, our siblings, our parents, our friends, our neighbors, and our colleagues than with strangers. Conflict is unavoidable in these relationships and, if left unresolved, it has the potential to tear them apart with the concomitant loss in the benefits of cooperation. Reconciliation is how we preserve and repair cooperative relationships in the face of our disputing.

---

2. In this sense, it is distinguishable from a mere resolution or settlement. Both resolution and settlement do not necessarily entail the end of a dispute or of the underlying conflict. *See* DOUGLAS H. YARN, DICTIONARY OF CONFLICT RESOLUTION 375, 380, 392 (1999) (defining reconciliation as "[r]enewal of applicable relations between persons who have been at variance," resolution as "[s]olution or the act of solving," and settlement as "[a]greement or arrangement ending a dispute"). In animal behavior, reconciliation refers to friendly reunions between former opponents and implies a behavior that serves the function of restoring social relationships and reducing social tension due to aggressive incidences. *See* NATURAL CONFLICT RESOLUTION 397 (Filippo Aureli & Frans B.M. de Waal eds., 2000).

3. For our purposes, a social group is simply two or more individuals in a cooperative relationship.

More broadly, reconciliation refers to the establishment of cooperative relations between persons, either individuals or groups, who have been at variance *without regard to whether they have had a prior cooperative relationship*.[4] As strangers encounter one another and come into conflict in pursuit of their own interests, they can choose to either compete or cooperate. If they initially compete and find the costs unacceptable, they can either disengage or attempt to form a cooperative relationship. Conflict-resolution practitioners commonly refer to such a transition from competition to cooperation—particularly in the context of large-scale, intergroup conflict—as reconciliation. It encompasses a variety of interventions meant to transform a temporary peace into a stable or permanent peace in which the parties cooperate or at least tolerate one another.[5] The most notable institutionalization of these interventions is the truth and reconciliation commission.[6] Most of these interventions are broadly influenced by concepts of restorative justice, which focuses on the effect of an offense on individuals rather than on the state in an attempt to promote the restoration of interpersonal relationships.[7] Consistent with the restorative-justice philosophy, reconciliation efforts tend to operate at the individual level by addressing such human emotions as fear, anger, and distrust.[8] Indeed, such emotions express the

---

4. Morton Deutsch, *Justice and Conflict*, *in* THE HANDBOOK OF CONFLICT RESOLUTION 41, 61 (Morton Deutsch & Peter T. Coleman eds., 2000).

5. *See generally* JOHN PAUL LEDERACH, BUILDING PEACE: SUSTAINABLE RECONCILIATION IN DIVIDED SOCIETIES (1997).

6. Truth and reconciliation commissions (TRCs) are organizations designed to investigate alleged human-rights violations in a particular locale in an attempt to resolve longstanding intergroup conflict so as to enable future peace. *See generally* PRISCILLA B. HAYNER, *Fifteen Truth Commissions—1974 to 1994: A Comparative Study*, 16 HUM. RTS. Q. 597 (1994). The most famous commission was undoubtedly South Africa's TRC. Organized in 1995, the TRC was a court-like body that attempted to ease South Africa's transition to democracy by holding hearings into the human-rights abuses of apartheid. For an overview, see ALEX BORAINE, A COUNTRY UNMASKED: INSIDE SOUTH AFRICA'S TRUTH AND RECONCILIATION COMMISSION (2001).

7. *See generally* JOHN BRAITHWAITE, RESTORATIVE JUSTICE & RESPONSIVE REGULATION (2002). For a theoretical defense of restorative justice and a comparison to traditional theories of punishment, see Zvi D. Gabbay, *Justifying Restorative Justice: A Theoretical Justification for the Use of Restorative Justice Practices*, 2005 J. DISP. RESOL. 349 (2005). For a proposal that elements of restorative justice should be implemented into American criminal procedure, see Stephanos Bibas & Richard A. Bierschbach, *Integrating Remorse and Apology into Criminal Procedure*, 114 YALE L.J. 85 (2004).

8. According to Haas,

> There is at least one common denominator to all these approaches to reconciliation. They all are designed to lead individual men and women to change the way they think about their historical adversaries. As a result, reconciliation occurs one person at a time and is normally a long and laborious process.

Charles Haas, *Reconciliation*, *in* BEYOND INTRACTABILITY (Guy Burgess & Heidi Burgess eds., 2003), *available at* http://www.beyondintractability.org/essay/reconciliation/?nid=1224. Lederach describes the goal as "building and healing the torn fabric of *interpersonal* and community lives and relationships." John Paul Lederach, *Civil Society and Reconciliation*, *in* TURBULENT PEACE: THE CHALLENGES OF MANAGING INTERNATIONAL CONFLICT 841, 842 (Chester A. Crocker, Fen Osler Hampson & Pamela Aall eds., 2001) (emphasis added).

underlying sources of resistance to reconciliation, and evolutionary biology offers an explanation of why humans experience them.

III
EVOLUTIONARY BIOLOGY AND THE RECONCILIATORY CYCLE

Emotions are biological. We experience an emotion when the brain responds to stimuli and, in turn, produces neurochemicals triggering a physiological response that we associate with a particular behavior, experience, or activity.[9] The human brain has been shaped by evolutionary forces producing a *species-typical* brain[10] that produces species-typical behavioral outputs in response to various stimuli. As the terms are used in biology, the *proximate cause* of an emotion is the brain's response to the stimuli, whereas the *ultimate cause* of an emotion can be traced to the evolutionary forces that shaped the human brain to so respond.[11] Those forces were the basic challenges of survival in the environment in which our current species-typical brain evolved. Biologists refer to these challenges as the environment of evolutionary adaptedness (EEA).[12] The EEA consists of both physical and social environments, the essential challenges of which consisted of food choice (eating), predator avoidance (survival), and mate selection (reproduction). If a given behavior is common for humans today, then the predisposition to so behave may have enhanced survival and reproduction over time in the EEA and, as a result, became "hard-wired" in our brains through natural selection.[13]

The social challenges of the EEA are particularly germane to the problem of reconciliation. Humans are highly social animals. Living in groups was crucial to our ancestors' survival. In the EEA, social-group formation was a

---

9. A tremendous number of theoretical perspectives on emotions have emerged in various fields over the course of time. *See, e.g.*, Susan A. Bandes, *Victims, "Closure," and the Sociology of Emotion*, 72 LAW & CONTEMP. PROBS. 1 (Spring 2009). The perspective adopted by Bandes most nearly reflects a neurobiological theory with an evolutionary perspective. For a useful overview of the neurobiological theory of emotion, see JOSEPH E. LEDOUX, THE EMOTIONAL BRAIN: THE MYSTERIOUS UNDERPINNINGS OF EMOTIONAL LIFE (1996).

10. Each individual's unique psychological profile results from a combination of species-typical brain, other inherited characteristics, and the effects of experience and environment on the brain. *See* John Tooby & Leda Cosmides, *The Psychological Foundations of Culture*, *in* THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE 19, 68 (Jerome H. Barkow, Leda Cosmides & John Tooby eds., 1995).

11. For an exploration of the proximate and ultimate causes of empathy, see generally Stephanie D. Preston & Frans B.M. de Waal, *Empathy: Its Ultimate and Proximate Bases*, 25 BEHAV. & BRAIN SCI. 1 (2002).

12. This term was coined by John Bowlby in reference to his work in attachment theory. JOHN BOWLBY, ATTACHMENT (2d ed. 1999).

13. This is a fundamental principle of evolutionary psychology. Evolutionary biologists generally recognize an architectural element of an organism as a presumptive adaptation when "it solves an adaptive problem with 'reliability, efficiency, and economy.'" Leda Cosmides & John Tooby, Evolutionary Psychology: A Primer (1997), http://www.psych.ucsb.edu/research/cep/primer.html. For many biologists and evolutionary psychologists, "hard-wired" may be too strong a term to describe an inherited behavioral predisposition from which individuals can vary and are not predestined to behave.

cooperative behavior that improved our ancestors' ability to warn of and fight off predators and to find food and mates.[14] With social living, however, came conflict and competition over resources. From a biological perspective, competitive behavior is hardly surprising, for purely selfish or self-regarding behavior would certainly seem to enhance reproduction and the survivability of one's genes in a world of scarce resources. But constant competition and conflict among all group members would quickly erode social cohesion. The adaptive way to deal with conspecific conflict (conflict within a species), and thereby to maintain the benefits of group living, was to form cooperative friendships, alliances, and coalitions. This required some level of seemingly altruistic behavior that enhanced the reproductive fitness of others at an apparent cost to the actor. Such cooperative, altruistic behavior among kin makes biological sense and is common among animals—the closer the kin, the more shared genes.[15] Altruistic behavior toward non-kin is also common among social animals and has been explained by the notion of direct reciprocity—by helping B today, A expects B to reciprocate tomorrow.[16] But there is a critical tension between cooperative, altruistic behavior and competitive behavior—how does A trust B to behave fairly? While it is our nature to cooperate, it is also our nature to "cheat" and take advantage of others' tendencies to cooperate because the competitive "selfish gene"[17] tempts B to defect and merely free ride (gain the benefits of cooperation without the costs). The result is a fundamental social dilemma: How does one determine whom to trust, whether one has been treated fairly, and what to do when cheated?

Game theory reveals a partial solution through the iterated, prisoners' dilemma game,[18] in which a reciprocating strategy of tit-for-tat reduces cheating and encourages cooperation. In a tit-for-tat strategy, one's first move is cooperative, while successive moves mimic those of the other player. If he

---

14. *See* ROBERT L. BETTINGER, HUNTER-GATHERERS: ARCHEOLOGICAL AND EVOLUTIONARY THEORY 158 (1991) (hunting efficiency); ROGER LEWIN & ROBERT A. FOLEY, PRINCIPLES OF HUMAN EVOLUTION 168 (2004) (noting that social-group formation served as a defense against predation). *See generally* DAVID BUSS, THE NEW SCIENCE OF THE MIND (2003) (detailing social-behavior adaptations to the various challenges and problems present in the EEA).

15. *See* W.D. Hamilton, *The Genetic Evolution of Social Behaviour I*, 7 J. THEORETICAL BIOLOGY 1 (1964) (laying out a precise mathematical formulation of the tendency for altruistic behavior as a function of the percentage of genes shared). This is generally referred to as "inclusive fitness."

16. Robert L. Trivers, *The Evolution of Reciprocal Altruism*, 46 Q. REV. BIOLOGY 35, 35 (1971).

17. *See* RICHARD DAWKINS, THE SELFISH GENE 4–12 (1976).

18. The classical formulation of the prisoners' dilemma game is as follows: Two suspected criminals, A and B, are arrested. The District Attorney lacks sufficient evidence for a conviction, so she visits each of the suspects separately to offer the same deal: if one testifies for the prosecution against the other and the other remains silent, the betrayer goes free and the silent accomplice is sentenced to five years in jail. If both remain silent, both are sentenced to two years in jail. If each betrays the other, each is sentenced to four years in jail. Since the prisoners are unable to communicate with each other, how should they act? For a historical overview of the prisoners' dilemma, see WILLIAM POUNDSTONE, PRISONER'S DILEMMA (1992). In the iterated prisoners' dilemma, two players repeat the game, thereby enabling a range of new behavior. *See generally* ROBERT AXELROD, THE EVOLUTION OF COOPERATION (1984).

cooperated, you cooperate, and if he defected, you defect. In other words, tit-for-tat entails behavior that is initially trusting, rewards cooperation with continued cooperation (positive reciprocity), and punishes cheating with defection (negative reciprocity). By punishing defection, the strategy encourages cooperation. The primary pitfall of a pure tit-for-tat strategy is that players can get trapped in a cycle of negative reciprocity.[19] Research demonstrates, however, that a player can break this costly cycle by randomly making an occasional, cooperative move in response to a defection.[20] This is roughly akin to random "forgiveness." Ultimately, this modification from pure tit-for-tat proves a more successful overall strategy.[21]

From an evolutionary point of view, individuals whose behavioral tendencies matched this modified tit-for-tat strategy in the EEA would have been more successful in eliciting cooperation from others and therefore more likely to survive, reproduce, and have descendents than those whose did not. As a result of this ultimate, or evolutionary, cause, modern *homo sapiens* tends to behave as if engaging in a tit-for-tat strategy: we are initially trusting and cooperative; we have the mental capacity to keep track of exchanges and to judge their fairness; we remember defectors and have a strong emotional urge to retaliate; and we are capable, if not prone, to forgive and resume relations, provided the relationship is important and that sufficient trust is reestablished. A growing body of scientific research is uncovering reconciliatory behaviors in other social animals[22] and tracing the physiological correlates, or proximate

---

19. Negative reciprocity also may carry certain associated costs. *See* Douglas H. Yarn & Gregory Todd Jones, *In Our Bones (or Brains): Behavioral Biology*, *in* THE NEGOTIATOR'S FIELDBOOK: THE DESK REFERENCE FOR THE EXPERIENCED NEGOTIATOR 283, 287 (Andrea Kupfer Schneider & Christopher Honeyman eds., 2007) ("In dynamic environments where responses to social norms are in flux, decisions to punish may not only be costly in and of themselves, but may carry steep opportunity costs associated with failing to cooperate with a previous defector who has newly decided to cooperate.").

20. Computer simulations conducted in the Computational Laboratory for Complex Adaptive Systems at the Consortium on Negotiation and Conflict Resolution have shown that game-theoretic strategies employing forgiving, or generous strategies, defined by continuing to cooperate to some extent, even in the face of defection, are evolutionarily successful strategies. Research results are on file with the authors. *See generally* The Consortium on Negotiation and Conflict Resolution, Nexus—The Biology of Conflict Resolution, http://www.cncrnet.org/nexus/research.html (last visited May 27, 2009).

21. *Id.*

22. Other social primates engage in conciliatory and consolation behaviors to restore important relationships after fights and other aggression. *See, e.g.*, Josep Call, Filippo Aureli & Frans B.M. de Waal, *Reconciliation Patterns Among Stumptail Macaques: A Multivariate Approach*, 58 ANIMAL BEHAV. 165 (1999); Frans B.M. de Waal, *Primates: A Natural Heritage of Conflict Resolution*, 289 SCIENCE 586 (2000) (primates generally); Frans B.M. de Waal, *Reconciliation Among Primates: A Review of Empirical Evidence and Unresolved Issues*, *in* PRIMATE SOCIAL CONFLICT 111 (William A. Mason & Sally P. Mendoza eds., 1993) (primates generally); Frans B.M. de Waal & Jennifer J. Pokorny, *Primate Conflict Resolution and Its Relation to Human Forgiveness*, *in* HANDBOOK OF FORGIVENESS 17 (Everett L. Worthington Jr. ed., 2005) (primates); Frans B.M. de Waal & Angeline van Roosmalen, *Reconciliation and Consolation Among Chimpanzees*, 5 BEHAV. ECOLOGY & SOCIOBIOLOGY 55 (1979) (chimpanzees). *See generally* NATURAL CONFLICT RESOLUTION (Filippo Aureli & Frans B.M. de Waal eds., 2000) (primates generally). These behaviors may be evolutionary antecedents of the human behaviors associated with seeking and granting forgiveness.

causes, of trust, fairness, vengefulness, and forgiveness.[23] Together, these tendencies constitute a behavioral cycle of reconciliation conceptualized in the following schema:

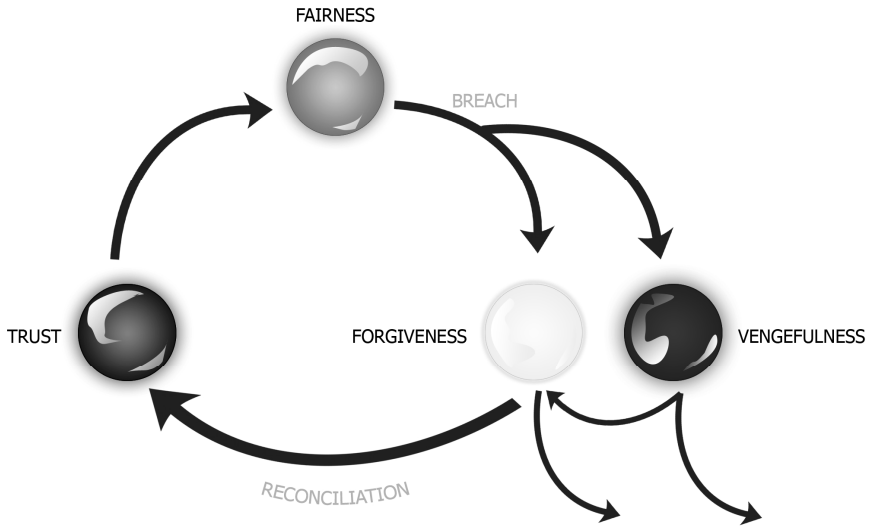


Figure 1: The Reconciliatory Cycle[24]

This schema describes the behaviors associated with cooperation, conflict, and its resolution. Conflict occurs when a party perceives through its sense of fairness that another party has violated expected norms of behavior, thereby breaching the trust between them. The party that sees itself as injured by the violation can punish, forgive, or do both. This party can resume cooperative or tolerant relations, or not, depending upon the satisfaction of retaliatory urges, sufficient trust, and the level of interdependence (including benefits of cooperation). The converse (in which retaliatory urges are not satisfied, there is

23. Social psychologists assert that forgiveness is related to empathy. For a good summary of this relationship, see Loren Toussaint & Jon R. Webb, *Gender Differences in the Relationship Between Empathy and Forgiveness*, 145 J. SOC. PSYCH. 673 (2005). Recent investigations of the functional neuroanatomy associated with empathy and forgiveness show, however, that they are distinct. Researchers in the United Kingdom used functional magnetic-resonance imaging (fMRI) to examine the neural correlates of making empathic and forgivability judgments. Tom F.D. Farrow et al., *Investigating the Functional Anatomy of Empathy and Forgiveness*, 12 NEUROREPORT 2433 (2001). These results suggest that "attempting to understand others is physiologically distinct from determining the forgivability of their actions." *Id.* at 2435. Although the two types of judgments shared activations in some areas of the brain, including the left frontal cortex, activation of the posterior cingulate gyrus was unique to forgiveness judgments. *Id.* This is a region that has been associated with decisionmaking, attentional tasks, and problem-solving, including an awareness that other people may hold views distinct from our own. *Id.* There seems to be a biological explanation for why we can put ourselves in another person's shoes without necessarily being able to forgive them.

24. For full-color illustrations and more-detailed supplemental material, see http://www.cncrnet.org/nexus/yarnandjoneslcpsupplemental.pdf.

insufficient trust, or the level of interdependence is weak) and the emotions associated with it create resistance to reconciliation among individuals in dyadic conflict.

The reconciliatory cycle depicts only the behavioral mechanisms of the injured party; however, the offender's behavior is equally relevant, not only to trigger retaliation but also to hasten forgiveness. The evolution of apologetic behavior makes sense in light of this scenario. Some way of hastening forgiveness would be to the advantage of a target of retaliation. Social signals that sufficiently assure the vengeful party that the offender will not repeat the offending behavior can mitigate the costs of retaliation to both parties and can lead toward reconciliation.[25] But the resumption of cooperative relations requires the resumption of trust. Thus, the ability both to make a sincere apology and to gauge its sincerity is crucial. Absent perception of an apology that sufficiently signals the future trustworthiness of the offender, the aggrieved party would resist reconciliation. Moreover, the offender's sense of fairness can also come into play in judging the fairness of the punishment: a punishment that the offender perceives as unfair may invoke retaliatory urges, mistrust, and resistance to cooperation, leading to an ongoing cycle of negative reciprocity.

IV

RESISTANCE TO RECONCILIATION IN THE CONTEXT OF INTERGROUP CONFLICT

By definition, the social behaviors that constitute the reconciliatory cycle are behaviors that evolved in social groups. They work most efficiently in the context of intragroup conflict, in which the victim and the offender are members of so-called in-groups.[26] Fairness and cheating are best understood through the norms of in-group interaction. The opportunity for repeat

25. Recent theoretical scholarship suggests that apologetic behavior evolved for this purpose. *See* Erin Ann O'Hara, *Apology and Thick Trust: What Spouse Abusers and Negligent Doctors Have in Common*, 79 CHI.-KENT L. REV. 1055, 1066–67 (2004) ("Individuals who develop the emotional framework necessary for the effective use of apology and forgiveness are thus placed at a competitive advantage relative to those individuals who must incur the full costs of moralistic aggression."); Erin Ann O'Hara & Douglas Yarn, *On Apology and Consilience*, 77 WASH. L. REV. 1121, 1147–53 (2002). Computational studies recently performed at the Primate Research Institute at Kyoto University in Japan suggest that apology can play a role similar to altruistic punishment as a means of maintaining cooperation, as long as the apology, which signals a willingness to conform to social norms in the future, is sufficiently costly. Kyoko Okamoto & Shuichi Matsumura, *The Evolution of Punishment and Apology: An Iterated Prisoner's Dilemma Model*, 14 EVOLUTIONARY ECOLOGY 703, 713–15 (2000).

26. An in-group is a social group with which an individual identifies as a member and expresses a bias in favor of other members. In contrast, individuals are negatively biased toward others who are members of an out-group. The terms are identified with social-identity theory and are commonly used in sociology. *See generally* Henri Tajfel & John Turner, *An Integrative Theory of Intergroup Conflict*, *in* THE SOCIAL PSYCHOLOGY OF INTERGROUP RELATIONS 33 (William G. Austin & Stephen Worchel eds., 1979) (social-identity theory). The terms may have originated with William Graham Sumner, who coined the term "ethnocentrism." WILLIAM GRAHAM SUMNER, FOLKWAYS: A STUDY OF THE SOCIOLOGICAL IMPORTANCE OF USAGES, MANNERS, CUSTOMS, MORES, AND MORALS 13 (1906).

interaction, both positive (cooperation) and negative (retaliation), is greater within a social group. The need to resume cooperative relations with fellow group members is greater than the need to do so with those outside the group, thereby encouraging apologetic and forgiving behaviors among group members. In the context of the social group, costly retaliation by an individual—costly in the sense that the individual benefit is exceeded by the individual cost to the retaliating party—is a social good benefiting the entire group. In addition, retaliation serves as "face-saving" behavior, signaling to all group members the victim's level of resistance to further victimization by any other group member. Signaling and communication of emotion are social skills that evolved in tandem with the requisite cognitive abilities to interpret and respond to the signals.[27] In this context, social anthropoids are emotionally contagious.[28] The emotions displayed in an interpersonal, dyadic conflict engage the entire group, thereby inviting support from other in-group members.

Evolution of these behaviors and our brains took place in an ancestral social environment initially consisting of small, stable bands of highly interdependent and closely related individuals that would temporarily split into sub-bands.[29] Although members of the in-group were subject to strategic pressures to cooperate, out-group members were not subject to the same pressures and were therefore more likely to successfully cheat. This made the cognitive capacity to distinguish in-group from out-group members and the differential treatment of them (prejudice) adaptive traits. Prejudicial and xenophobic behavior—for example, fear and distrust of strangers—is shared by most social primate species, suggesting that it was inherited through our common ancestry.[30] Xenophobia is also demonstrated by intergroup conflict, primarily in the form of lethal raiding.[31] Intergroup conflict was exacerbated by bipedalism and

---

27. *See generally* JONATHAN H. TURNER, ON THE ORIGINS OF HUMAN EMOTIONS: A SOCIOLOGICAL INQUIRY INTO THE EVOLUTION OF HUMAN AFFECT (2000).

28. *See* FRANS DE WAAL, GOOD NATURED: THE ORIGINS OF RIGHT AND WRONG IN HUMANS AND OTHER ANIMALS 69–70 (1997).

29. *See generally* DEAN FALK, PRIMATE DIVERSITY (2000).

30. Chimpanzees are territorial and attack male out-group members who wander into the in-group's home range. Additionally, they patrol the edges of the group range. *See generally* RICHARD WRANGHAM & DALE PETERSON, DEMONIC MALES: APES AND THE ORIGINS OF HUMAN VIOLENCE (1996). For comparisons with so-called primitive human society, see Christopher Boehm, *Segmentary 'Warfare' and the Management of Conflict: Comparisons of East African Chimpanzees and Patrilineal–Patrilocal Humans*, *in* COALITIONS AND ALLIANCES IN HUMANS AND OTHER ANIMALS 136 (Alexander H. Harcourt & Frans B.M. de Waal eds., 1992). For a discussion of the evolutionary foundations of learning mechanisms leading to fear of out-group members, see Terry A. Maroney, *Unlearning Fear of Out-Group Others*, 72 LAW & CONTEMP. PROBS. 83 (Spring 2009).

31. For a good overview of the evolution of tribalism and warfare, see MATT RIDLEY, THE ORIGINS OF VIRTUE: HUMAN INSTINCTS AND THE EVOLUTION OF COOPERATION 150–93 (1996). The relationship between feelings toward members of one's own group and those toward those in the out-group are not necessarily directly related. That is, affiliative feelings toward one do not create hostility toward the other. *See* Marilynn B. Brewer, *The Psychology of Prejudice: Ingroup Love or Outgroup Hate?*, 55 J. SOC. ISSUES 429 (1999) (A preference for members of the in-group, rather than direct animus toward an out-group, motivates discrimination against the out-group.).

upright walking, which allowed our ancestors to forage over a larger range, supporting the formation of bigger groups.[32] The formation of larger groups also provided better protection from predators, including other humanoids. Ironically, social and competitive pressures within large groups also encouraged continuous division into additional small, more-manageable groups.[33] More groups equals more boundaries between territories and, in a xenophobic species, more intergroup conflict. Larger groups trump smaller groups in intergroup conflict, so selective pressures favored the social–emotional repertoire needed to form and maintain larger groups and to motivate them through emotional contagion to defend and attack.[34] As a result, humans have the tendency to be cooperative and tolerant toward in-group members while hostile and intolerant toward out-group members.[35]

The selective pressures toward larger-group formation, together with the increasing probability of conflict with members of out-groups, also favored the cognitive ability to manage group boundaries. Groups can grow either by increasing reproduction or by inducting individuals from outside the group. Although some transfer between groups is necessary to prevent inbreeding, there was a strong incentive to assimilate non-kin males who could help deter attack and take territory.[36] Assimilation carried the risk of increased intragroup conflict; therefore, in-group members had to be discriminating as to which individuals to induct. Combined with the problem of distinguishing friend from foe in a larger group consisting of less-closely related individuals, assimilation created evolutionary pressure on the cognitive capacity both to recognize insiders from outsiders, and to tolerate insiders but reject outsiders.

In this way, evolved reconciliatory behavior favoring social cooperation helped define groups, favored xenophobia, and promoted intergroup conflict.

---

32. Michael J. Lovaglia, Chana Barron & Jeffrey Houser, Social Development and Human Evolution: Managing the Ingroup Boundary 5 (Jan. 31, 2003) (unpublished presentation to the Theory Workshop, Dep't of Sociology, Univ. of Iowa) (on file with *Law and Contemporary Problems*).

33. *Id.* at 5.

34. *See* TURNER, *supra* note 27, at 30–34.

35. *See generally* THE SOCIOBIOLOGY OF ETHNOCENTRISM: EVOLUTIONARY DIMENSIONS OF XENOPHOBIA, DISCRIMINATION, RACISM, AND NATIONALISM (Vernon Reynolds, Vincent Falger & Ian Vine eds., 1987). GORDON ALLPORT, THE NATURE OF PREJUDICE (1954) is considered the seminal work on prejudice by most psychologists and sociologists but lacks reference to evolution. Similarly, much of the more influential social-psychology theories on prejudice and stereotyping lack an evolutionary perspective. *See, e.g.*, Alice H. Eagly & Valerie J. Steffen, *Gender Stereotypes Stem from the Distribution of Women and Men into Social Roles*, 46 J. PERSONALITY & SOC. PSYCH. 735 (1984) ("social role theory" of stereotyping); Samuel L. Gaertner & John F. Dovidio, *The Aversive Form of Racism*, *in* PREJUDICE, DISCRIMINATION AND RACISM 61 (John F. Dovidio & Samuel L. Gaertner, eds., 1986) ("aversive racism" theory); David L. Hamilton & Robert K. Gifford, *Illusory Correlation in Interpersonal Perception: A Cognitive Basis of Stereotypic Judgments*, 12 J. EXPERIMENTAL SOC. PSYCH. 392 (1976) ("illusory correlation" theory of stereotyping); Tajfel & Turner, *supra* note 26, at 33 ("social identity" theory alternative to Allport). More recently, some social psychologists are integrating evolutionary explanations into their work. *See, e.g.*, HAROLD D. FISHBEIN, THE ORIGINS OF PREJUDICE 39–80 (2002).

36. Lovaglia, Barron & Houser, *supra* note 32, at 8.

In turn, intergroup conflict created more selective pressures favoring the cognitive ability to discriminate, socially cohesive behaviors toward members of the in-group, and hostile behaviors toward members of the out-group. Therefore, intergroup conflict involved an additional layer of resistance to apology, forgiveness, and reconciliation that could be summarized as inherent prejudicial behavior expressed by fear, distrust, and hostility toward out-group members.

V

RESISTANCE TO RECONCILIATION IN THE CONTEXT OF MODERN SOCIAL NETWORKS

Up to this point, this article has focused on how the strategic dynamics of dyadic interaction underlie the ultimate and proximate biological causes of an individual's tendency to resist reconciliation and cooperation generally. The tendency to resist can be compounded by two additional levels of strategic dynamics: (1) the strategic dynamics of interaction in triads or larger groups, which become quite complicated very quickly due to the possibility of coalitions; and, perhaps more subtly, (2) the population-level dynamics of local interactions that arise as a result of these interactions taking place within specific social architectures. These population-level effects may result from interactions that take place in a dyad or a larger group, but the effects are independent from the game-theoretic, strategic decisionmaking that provides the customary frame for thinking about cooperative interaction. Both the strategic dynamics of large-group interaction and the dynamics related to social architecture are properly thought of as sources of barriers to large-group cooperation. But given the long-standing problems of tractability faced by theories of social choice in groups larger than two, we focus here on the structural dynamics that influence dyadic interactions in larger groups.[37]

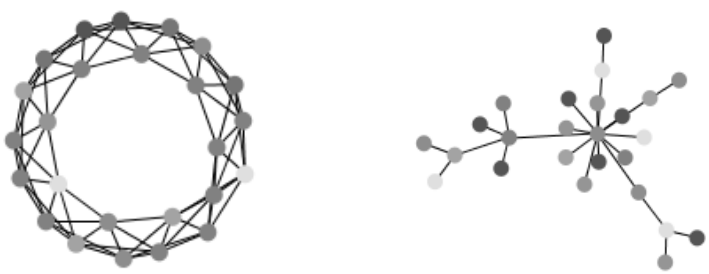
A. Characteristic Social Architecture

The evolved tendency to resist reconciliation in intergroup conflict is complicated by more-recent changes in social-group architecture. Modern *homo sapiens* appeared, approximately 100,000 years ago, during the Pleistocene.[38] Because the Pleistocene ended only 12,000 years ago, most human

37. *See generally* KENNETH J. ARROW, SOCIAL CHOICE AND INDIVIDUAL VALUES (1951) (laying out modern social-choice theory and showing that no social-choice rules exist to produce stable outcomes in large groups); JAMES M. BUCHANAN & GORDON TULLOCK, THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL DEMOCRACY (1962) (laying out public-choice theory and the frailties of decisionmaking in large groups); MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS (1965) (demonstrating that even where members of large groups share common interests, concerted, collective action cannot be assumed). For a recent attempt to reconcile rational-choice and structural conceptions, see LUIS FERNANDO MEDINA, A UNIFIED THEORY OF COLLECTIVE ACTION AND SOCIAL CHANGE (2007).

38. Vinayak Eswaran, Henry Harpending & Alan R. Rogers, *Genomics Refutes an Exclusively African Origin of Humans*, 49 J. HUMAN EVOLUTION 1, 1–2 (2005).

psychological mechanisms are adapted to challenges encountered in Pleistocene environments described above;[39] that is, our brains are much as they were then. Twelve thousand years in evolutionary terms is just a blink of the eye, offering little time for natural selection to further evolve our brains so as to significantly change behavioral tendencies. The social environment in which we now live, however, has changed dramatically in this time period. With the technological development of agriculture, it became possible to live in much larger groups and stay in one place. Instead of occasionally competing groups of comparably small bands of related individuals, large urban populations coordinate vastly diverse activities supported by evolving cultural institutions, such as the rule of law. Individuals are less reliant on an immediate, homogeneous, and geographically bounded social network. Today, it is relatively easy to travel, communicate, and form cooperative relationships outside such a community. The dramatically increasing importance of the Internet is possibly hastening this trend by replacing small, regularly-connected social networks of the EEA with extremely large, scale-free networks. The result: few individuals will remain highly connected, but the vast majority of individuals will lead largely unconnected, anonymous lives.



A **B**

Figure 2: **A**: A regularly connected, degree-homogeneous network representative of what may have been typical of the EEA. **B**: A scale-free, degree-heterogeneous network representative of the modern age.[40] For illustrative purposes, the *structure* of the network and explicitly not the *group size* is representative.

Social architecture matters. Average degree (the number of connections an individual shares with others in the social network) and heterogeneity of degree, for example, can have dramatic effects on the prevalence of pro-social

39. *See generally* Donald Symons, *On the Use and Misuse of Darwinism in the Study of Human Behavior*, *in* THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE, *supra* note 10, at 137–59. The important point is not the precise point in history at which our brain evolved, but that the *environment* in which it evolved is different than the environment of today.

40. For full-color illustrations and more-detailed supplemental material, see http://www.cncrnet.org/nexus/yarnandjoneslcpsupplemental.pdf.

behavior in large groups. Our research on evolutionary dynamics in networks demonstrates that a certain level of degree is necessary for reciprocal cooperation to arise, but that when degree becomes large relative to population size, such reciprocity suffers.[41] Further, our simulations show that reciprocal strategies that promote cooperation in the degree-homogeneous, regularly connected social networks typical of the EEA are not as successful in promoting cooperation in the degree-heterogeneous networks of the modern age.[42] In short, we have a Paleolithic mind in a postmodern age, and behavior that seems irrational in the present environment may be perfectly rational when considered in the context of the EEA. This mismatch between our ancestral, evolved brains and the present-day environment may explain the various heuristics, biases, and emotions that seem to depart irrationally from the model of *homo economicus* decisionmaking. Emotional contagion is less effective across a larger, less-interconnected social network. And there may be other structural factors than can be identified.[43] So, particular social structures that deviate significantly from social structures of the EEA can be barriers to effective group cooperation.

B. Integration

One well-studied question of social structure[44] is the extent to which efforts at integration reduce prejudicial behavior. It has been noted that with intergroup conflict, the action happens on the borders.[45] More nuanced is the idea that the structure of the borders themselves matters. Recent models attempting to predict civil violence using agent-based network models have demonstrated that there is little conflict with full segregation and little conflict with full integration—it is in intermediate stages, where there is a critical mass of in-group–out-group behavior, that conflict arises.[46] Our recent work subjecting the contact hypothesis to varying levels of integration has produced

41. Our current work explores the relationship of local clustering to average degree and heterogeneity of degree in the promotion of cooperation. Gregory Todd Jones, Douglas H. Yarn, Reidar Hagtvedt & Travis Lloyd, *Homogeneity of Degree in Complex Social Networks as a Collective Good*, 24 GA. ST. U. L. REV. 931 (2008).

42. It may not be particularly surprising that high average degree is harmful to cooperation, given that it is well known that fully connected "mean field" simulations lead to pure defection when evolutionary replication dynamics are at play. *Id.* A particularly important finding of our work is that heterogeneity of degree exerts an influence on cooperation that is statistically distinct from average degree. *Id.*

43. *Id.*

44. This question was developed in Allport's contact hypothesis. *See* ALLPORT, *supra* note 35. It was made famous by Shellling's models of segregation. *See* THOMAS C. SCHELLING, MICROMOTIVES AND MACROBEHAVIOR (1978).

45. *See supra* note 44; *infra* note 46.

46. *See* May Lim, Richard Metzler & Yaneer Bar-Yam, *Global Pattern Formation and Ethnic/Cultural Violence*, 317 SCIENCE 1540, 1542 (2007) (identifying a process of global pattern formation in which violence occurs at the boundaries of regions differentiated by culture).

similar results.[47] At levels approaching full segregation, prejudicial strategies (wherein individuals behave reciprocally with members of their own group, but always defect against members of other groups) suffer no particular disadvantage given that there is no one to act prejudicially against. At levels approaching full integration, prejudicial strategies are driven to extinction and social welfare is maximized. However, at intermediate levels of integration, prejudicial strategies are more successful than nonprejudicial strategies, and cooperation, along with social welfare, suffers. So certain intermediate levels of integration could exacerbate resistance to reconciliation and effective cooperation.

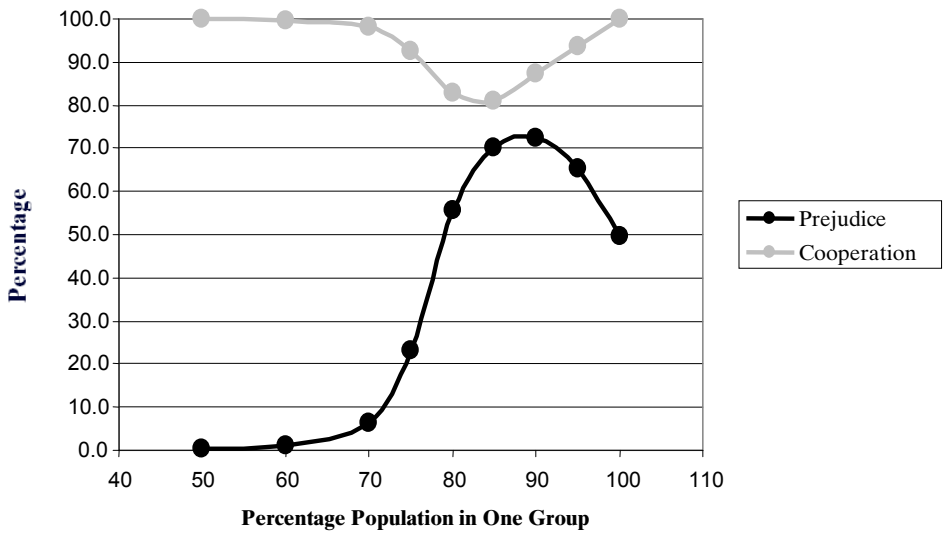


Figure 3: The evolutionary success of prejudicial strategies as a percentage of the population (Prejudice) and social welfare measured as cooperative interactions as a percentage of overall interactions (Cooperation).[48]

C. Nonlinear Participation Effects

Social dynamics are often nonlinear. Consider the example of critical mass: At the end of a particularly moving speech or musical performance, a few people will come to their feet during the applause, followed by a few more, and then, with the addition of only one other individual, a threshold is reached that brings the entire audience to its feet.[49] Even after continued efforts to involve as

47. Our work investigates the robustness of the contact hypothesis when subjected to various spatial conditions. Results of computer simulations show a nonlinear relationship between integration policy and the success of prejudicial strategies. Small modifications to interventions can therefore have disproportionate effects on prejudicial behavior.

48. For full-color illustrations and more-detailed supplemental material, see http://www.cncrnet.org/nexus/yarnandjoneslcpsupplemental.pdf.

49. An atomic pile 'goes critical' when a chain reaction of nuclear fission becomes self-sustaining; for an atomic pile, or an atomic bomb, there is some minimum amount of fissionable material that

many individuals as possible, the addition of one more individual, or a small group of individuals, can cause a cascade, or a threshold effect, that brings about a phase transition[50] resulting in large-scale collective action. This also involves emotional contagion. Our simulations show that the addition of a single relationship or the conversion of a single agent can cause network effects that transform the entire population.[51] So, Herculean efforts directed at a high threshold may offer no results, whereas very small efforts can bring about system-wide change if the threshold is low. The mistaken impression that efforts toward reconciliation and cooperation in large groups produce linear results can be a significant barrier to the success of these efforts.

D. Institutional Design

As important as recognizing the nonlinearity of social dynamics is recognizing that specific individuals may be more likely to bring about a cascade of collective action than others. When the evolved mechanisms of our species-typical brain fall short in the modern environment, we depend on the design of targeted institutions to fill the gap, and certain individuals are more relevant to this task. Certainly, the identification of these relevant individuals is not an easy task, but our recent simulations demonstrate that it is possible.[52] The sparse culling of only a few relationships can result in network effects that spread reciprocal cooperation throughout the network.

> has to be compacted together to keep the reaction from petering out . . . . The principle of critical mass is so simple that it is no wonder that it shows up in epidemiology, fashion, survival and extinction of species, language systems, racial integration, jaywalking, panic behavior, and political movements.

SCHELLING, *supra* note 44, at 89. *See generally* GERALD MARWELL & PAMELA OLIVER, THE CRITICAL MASS IN COLLECTIVE ACTION (1993).

50. A phase transition is an abrupt change in a system, as when water, upon reaching its boiling point, suddenly becomes a vapor.

51. *See* figs. 4–6, *infra* pp. 78–80.

52. *Id.*

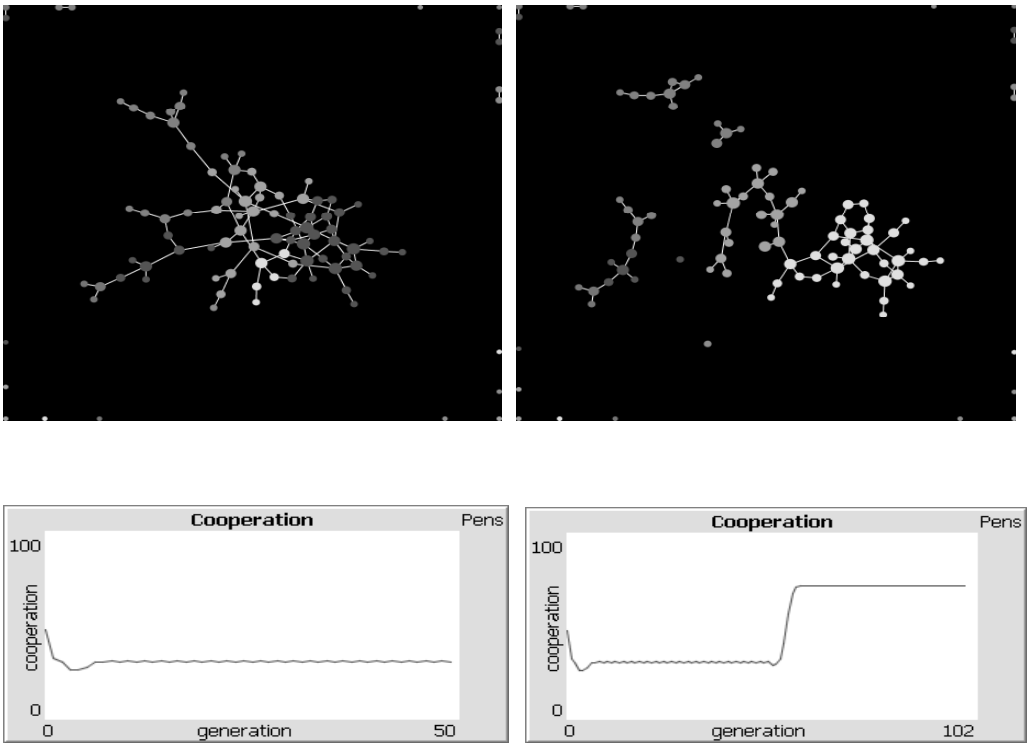


Figure 4: A sparse culling severs only a few relationships, but results in network effects that spread reciprocal cooperation throughout the network. The lighter shades represent cooperating, reciprocating strategies.[53] Conversely, the addition of a single, targeted relationship can produce similar positive effects.

53. For full-color illustrations and more-detailed supplemental material, see http://www.cncrnet.org/nexus/yarnandjoneslcpsupplemental.pdf.

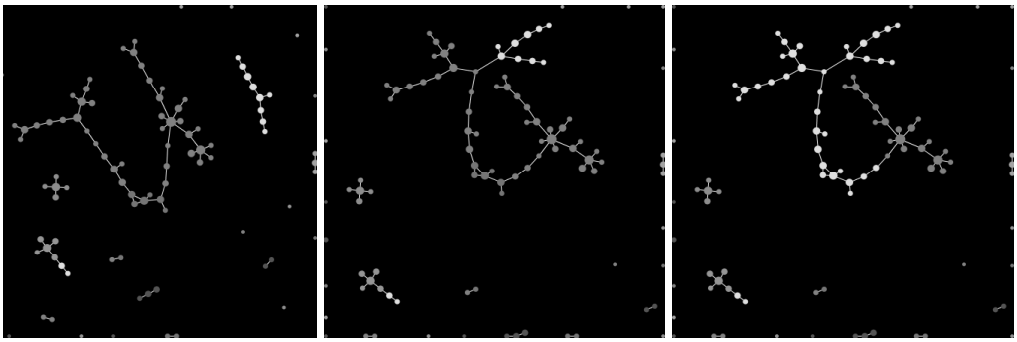
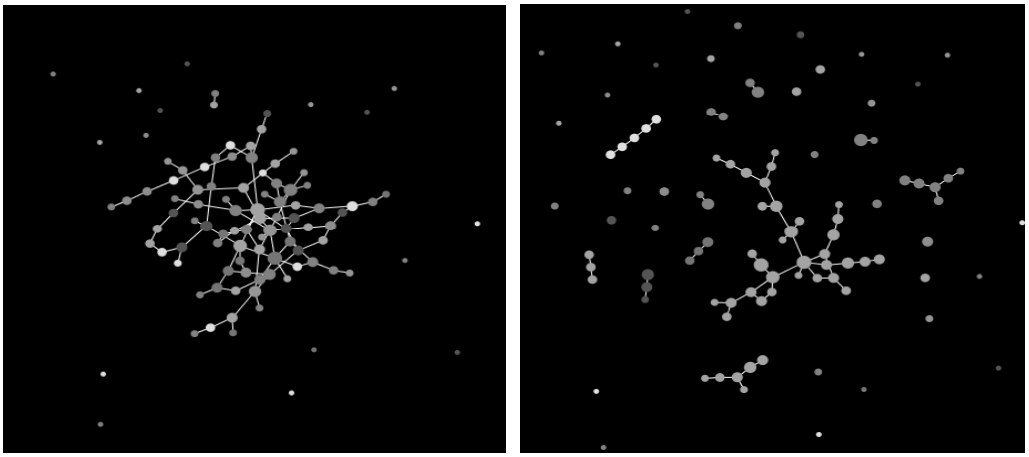


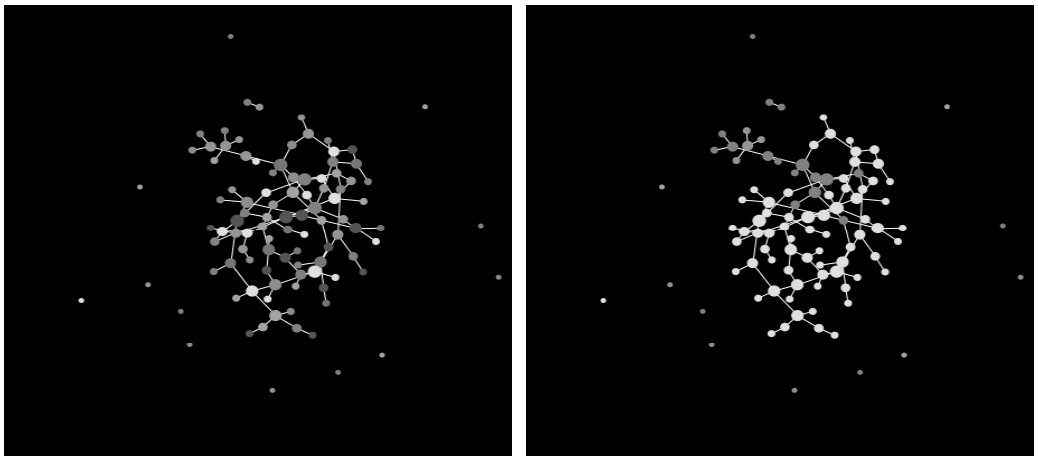
Figure 5: A single targeted relationship is added resulting in network effects that spread reciprocal cooperation throughout the network. The lighter shades represent cooperating, reciprocating strategies.[54]

The timing of exogenous interventions is also critically important. The use of sparse culling in a network that is not at equilibrium can result in extreme fragmentation of the network. (See top panels of Figure 6). In contrast, an identical sparse culling implemented after the network has reached a stable equilibrium brings about the desired results while maintaining the overall cohesiveness of the social network. (See bottom panels of Figure 6).



A **B**

54. For full-color illustrations and more-detailed supplemental material, see http://www.cncrnet.org/nexus/yarnandjoneslcpsupplemental.pdf.



C **D**

Figure 6: Timing of interventions counts for a lot. In the upper two panels (A & B), sparse culling is employed before the network reaches equilibrium. In the bottom two panels (C & D), the network is allowed to reach equilibrium before sparse culling is employed. The lighter shades represent cooperating, reciprocating strategies.[55]

Finally, these barriers related to social architecture are highly interrelated. Properly designed institutions can help to overcome dynamics in characteristic social structure and can identify opportunities in nonlinear participation effects. But it should be clear that institutions improperly targeted or improperly timed, even when well-intentioned, can bring about unanticipated phase transitions that can produce unintended results.

VI
CONCLUSION

How is this relevant to truth and reconciliation commissions (TRCs)? Admittedly, evolutionary biology is a blunt tool with which to analyze the complexities of intergroup conflict in modern human societies: it is reductionist by definition. Yet the basic principles of human behavior derived from a biological perspective offer some insight into what a TRC must do to overcome resistance and actually achieve intergroup reconciliation. At the individual level, TRCs must satisfy retaliatory urges, induce apology and forgiveness, evoke emotional contagion, and build sufficient trust while reducing prejudice. Much of the criticism directed at TRCs focuses on their inability to deliver

55. For full-color illustrations and more-detailed supplemental material, see http://www.cncrnet.org/nexus/yarnandjoneslcpsupplemental.pdf.

retributive justice.[56] Most TRCs cannot do so because they operate in transitional societies in which the government is too weak or too dependent upon still-powerful perpetrators to prosecute them. Without punishment, are perpetrators' testimonies and apologies, if any, sufficiently costly to be accepted as a signal of trustworthiness or to induce forgiveness? To the extent apology and forgiveness occur at the individual level through TRC proceedings, how does that get transferred through emotional contagion to a societal or national level? At the group level, TRCs must counteract negative social-architecture effects, overcome disadvantageous degrees of integration, engage enough people to reach critical mass, reduce the influence of negative relationships while enhancing the influence of positive ones, and do it all at the right time.

It is unrealistic to expect this of a single institutional intervention. Intergroup reconciliation in the wake of longstanding historic injustices is by necessity a long and complex process of which a TRC is merely a step in that direction. To the extent they are successful in overcoming some resistance to reconciliation, TRCs may simply provide individuals with some sense of belonging to a superordinate group with the former victimizers,[57] provide opportunities to "get to know one another better" so as to reduce fear conditioning,[58] or provide enough common narrative of the past ("truth") to undermine the competing narratives necessary to support continued adversarialism, thereby increasing the effectiveness of other reconciliatory efforts. Indeed, TRCs rarely operate in isolation. As James Gibson points out in this symposium, TRCs may be more the product of change than the cause of it[59]—an observation that has evolutionary implications of its own. Usually, other reconciliatory efforts are taking place at different societal levels. Presumably, if enough individuals or the "right" individuals are positively affected, a transformative critical mass will be reached that signals a breach in the biological barriers to reconciliation.

---

56. For a summary of this criticism and citations to legal scholars voicing it, see Kevin Avruch & Beatriz Vejarano, *Truth and Reconciliation Commissions: A Review Essay and Annotated Bibliography*, 4 ONLINE J. PEACE & CONFLICT RESOLUTION 37, 38–39 (2002).

57. *See* Tom Tyler, *Governing Pluralistic Societies*, 72 LAW & CONTEMP. PROBS. 187 (Spring 2009) (discussing how procedural justice promotes superordinate-group identification to manage intergroup conflict).

58. *See* Maroney, *supra* note 30, at 87–88. (suggesting that racial integration and increased contact can reduce evolutionarily-driven fear conditioning)

59. James L. Gibson, *On Legitimacy Theory and the Effectiveness of Truth Commissions*, 72 LAW & CONTEMP. PROBS. 123, 124 (Spring 2009).