

Economists and some others have been claiming that altruism unexplainable as a result of evolution has been demonstrated in their tests with college students. It is important that all possible alternatives be explained carefully, and that the tests that have been used are expected to give appropriate, accurate results. In particular, evolutionists need to understand all the different ways nepotism and social reciprocity can function in different kinds of groups. What follows is an incomplete list of relevant propositions and variations that need to be considered.

1. Cooperation does not necessarily entail altruism. The dictionary definition of cooperativeness is a group seeking to achieve a common goal. Every action by every individual may be entirely selfish.
2. Evolution does one principal thing: it maximizes the likelihood of persistence of genes, whether they exist within the striving individual, only in its offspring, or only in its collateral relatives that carry a higher proportion of the striving individual's genes than do others in the population or group.
3. It is probably not appropriate to use evidence that simple organisms such as slime molds appear to behave as if they recognize and assist like genes in unknown individuals demonstrates that humans do the same kinds of things. The evidence that humans socially learn in special and complex ways who their genetic relatives are supports the hypothesis that this system has evolved and replaces alternatives using "green beard" genes.
4. Eusocial forms sometimes live as lone individuals (e.g., queens that found nests alone and males that operate as individuals). We should not expect that such forms will perform exactly as do forms that never live alone but always in groups; nor will they behave exactly as do forms, such as modern humans, that do not have much chance of survival except in groups.
5. Genes in genomes may be expected to evolve to cooperate completely with the rest of the genome between meiotic events, because during that period they cannot change groups, and their chances of maximal representation and persistence in subsequent generations can only be accomplished by effects that maximize assistance to the group as a whole. Competition among genes, when it occurs, is expected during meiotic events, and the change to haploid; but unless their action in specific environments does not subtract from the evolved cooperative effects within the genome between meiotic events, genes that compete during meiosis are unlikely to maximize their representation and persistence across generations. They will be comparable to cancer because their gains cannot last.
6. Novel groups without evolved relationships are not relevant. Every test applied to individual organisms must be interpreted in terms of evolved relationships and the specific—and often subtle or complex—social environment during the experiments. For example, senior investigators as test managers and other students or junior investigators create entirely different environments for undergraduate students, as in behavior with respect to likelihood of beneficence or attitudes toward defending or being casual about

the social groups involved. Similarly, individuals with a history of living in tightly associated groups of genetic relatives or closely attached to a religious group are in environments that differ from groups lacking in such relationships.

7. Organisms that live in groups, as do humans, are expected to evolve in the direction of complete cooperation. The strong evidence of potent competition within social groups, however, suggests that complete cooperation is unlikely in most situations, and even when it occurs it is usually achieved only occasionally and briefly. Suggesting that positive social concepts such as empathy exist in a species is not evidence of complete cooperation. To the extent that groups survive as a whole, in the short-range fashion of haploid and diploid genomes, approaches to complete cooperation are unlikely to occur except during the most intense levels of cooperation, which, ironically, are most closely associated with between-group competition such as the wars and genocides of the 20th century that accounted for nearly 250 million premature, deliberately caused deaths.

Perhaps the most important set of questions anyone can ask about any subject is this: Who are we? How did we get to be this way? What can we do about it? These questions, in slightly different forms, have been expressed for more than 200 years, by the French Bishop of Orleans, Antoine-Philibert (1897-98), Charles Darwin (1859), Paul Gauguin (1887-88), Edward O. Wilson (2009), and surely many others. I have used these questions as subtitles for decades. In my view, asking and answering these questions is the most important step to acceptance of human diversity and progress toward cooperation in global problems, which to my knowledge has never before been achieved.