

Gender and Politics Among Anthropologists in the Units of Selection Debate

William Yaworsky · Mark Horowitz ·
Kenneth Kickham

Received: 26 June 2014 / Accepted: 30 October 2014 / Published online: 9 December 2014
© Konrad Lorenz Institute for Evolution and Cognition Research 2014

Abstract In recent years evolutionary theorists have been engaged in a protracted and bitter disagreement concerning how natural selection affects units such as genes, individuals, kin groups, and groups. Central to this debate has been whether selective pressures affecting group success can trump the selective pressures that confer advantage at the individual level. In short, there has been a debate about the utility of group selection, with noted theorist Steven Pinker calling the concept useless for the social sciences. We surveyed 175 evolutionary anthropologists to ascertain where they stood in the debate. We found that most were receptive to group selection, especially in the case of cultural group selection. The survey also revealed that liberals and conservatives, and males and females, all displayed significant differences of opinion concerning which selective forces were important in humanity's prehistory. We conclude by interpreting these findings in the context of recent research in political psychology.

Keywords Evolutionary anthropology · Gender · Politics · Units of selection

Perhaps no controversy in modern evolutionary theory is more divisive than the “units of selection” debate. That natural selection preserves organisms best adapted to their environments is the cornerstone of modern evolutionary theory. Yet the extent to which selection acts upon groups

of organisms—as among the social species—raises the knotty question at the heart of the controversy: can selection at the level of inter-group competition trump evolutionary forces at the within-group level? And if so, has group selection been a decisive force in shaping the behavior not only of such “eusocial” species as ants and bees but also of human beings?

To be sure, the question might appear strictly academic, a puzzle for dispassionate scientists to be adjudicated solely by the data. Yet well-known figures such as Richard Dawkins, Stephen Pinker, E. O. Wilson, and David Sloan Wilson have weighed in to shed light (and for some, heat) on the matter. Indeed, witnessing the volley of barbs brings to memory the early years of the sociobiology controversy, with the venerable E. O. Wilson (2012a) again at the center of the storm. Release of his 2012 book, *The Social Conquest of Earth*, has been met with markedly mixed reviews. E. O. Wilson's rejection of kin selection in favor of group selection in explaining the ecological dominance of ants and humans has piqued both enthusiasm and ire among his evolutionary colleagues.¹ Among enthusiasts, the psychologist Jonathan Haidt (2012a) credits Wilson for helping spur a “major comeback” for the long controversial idea. David Sloan Wilson concurs by welcoming E. O. Wilson's embrace of group selection, but chides him for pitting group selection against kin selection. For D. S. Wilson, whose work on “trait-group selection” goes back decades, a clear “consensus of the many” exists among evolutionary scientists that both perspectives are equally useful—simply different “languages” explaining

W. Yaworsky (✉) · M. Horowitz
Department of Behavioral Sciences, University of Texas at
Brownsville, Brownsville, TX, USA
e-mail: william.yaworsky@utb.edu

K. Kickham
Political Science Department, University of Central Oklahoma,
Edmond, OK, USA

¹ Note that E. O. Wilson and his collaborators envision early stages of individual selection followed by a later stage of multilevel selection as being instrumental in the genesis of eusociality.

the same phenomena. Indeed, for D. S. Wilson (2012), the era of “kin selection versus group selection” has passed.

Detractors will have none of it. Pinker (2012) sees group selection as a “confusing term” and “loose metaphor”—a “scientific dust bunny” that “obfuscates evolutionary theory.” Indeed, he stresses that group selection “has no useful role to play in psychology or social science.” Homing in on an earlier paper in *Nature* by Nowak, Tarnita, and Wilson (2010), Jerry Coyne (2011) adds that the only reason such “dreck” could be published was due to the fame of its authors. (“If Joe Schmo et al. from Bugarall State University had submitted such a misguided paper to *Nature*, it would have been rejected within an hour.”) Richard Dawkins is hardly more sympathetic. In a stinging critique, Dawkins (2012) impugns E. O. Wilson’s “wanton arrogance” for not acknowledging that he “speaks for himself against the great majority” of his professional colleagues. Indeed, the renewal of group selection is hardly the “consensus of the many” for Dawkins.²

Another echo of the earlier sociobiology controversy is the salience of politics and charges of ideological bias in the dispute. David Queller (2012) suggests that part of the “appeal” of group selection is that it “seems to tell us that nature is not as coldblooded and cruel as we feared. Evolution can produce good behavior towards others! ... One can almost hear the Hallelujahs.” Jerry Coyne agrees: “[P]eople want to believe in group selection. That doesn’t just include scientists like D. S. Wilson.... We want to think that stuff like religion, cooperation, and altruism have spread by group selection because that involves the concept of harmonious and cooperating groups” (Coyne 2011; emphasis his).³ Pinker is perhaps more muted in his critique, noting that advocates of group selection “have drawn normative moral and political conclusions from these scientific beliefs, such as that we should recognize the wisdom behind conservative values, like religiosity, patriotism, and puritanism, and that we should valorize a communitarian loyalty and sacrifice for the good of the group over an every-man-for-himself individualism” (Pinker 2012).

² Dawkins (2012) includes in his critique a list of 141 evolutionary scientists who share his rejection of group selection. E. O. Wilson (cited in Dawkins 2012) responded briefly by noting that if science “depended on rhetoric and polls, we would still be burning objects with phlogiston and navigating with geocentric maps.” Wilson (2012b) would later state in an interview with Charlie Rose that Dawkins is a “good man,” though “confused” and “does not publish in peer-reviewed journals.”

³ Coyne (2011) goes on to suggest crasser, self-promoting motives: “[W]hile group selection is moribund among evolutionary biologists ... its vocal proponents write best-selling books.” Both D. S. Wilson and Nowak are “heavily funded” by “the insidious Templeton Foundation,” and Haidt received “two Templeton grants ... [and] a sabbatical semester” to write his book.

Herbert Gintis (2012) responds to Pinker’s argument by defending his own scientific impartiality: there is no “liberal” or “conservative” sociobiology—just “good science.” Yet it is plain that Gintis’ criticism of inclusive fitness theory over the years rests on a more sanguine view of human nature. He and colleagues, such as Samuel Bowles, charge evolutionary biologists with an unduly selfish view of human nature, one that reduces inherent human altruism to “reciprocal altruism,” opportunism, and concern for reputation (e.g., Gintis et al. 2008). In both print and in public talks, Gintis decries Dawkins’ (1976) reference to human beings as “survival machines” who are “born selfish,” as well as Ghiselin’s (1974) claim that “[w]hat passes for cooperation turns out to be a mixture of opportunism and exploitation.... Scratch an altruist, and watch a hypocrite bleed” (Gintis 2007). For Gintis, morality is no mere “veneer” for selfish human motives. Some cross-cultural game-theory experiments demonstrate that humans have fundamental altruistic predispositions that can best be explained by a multilevel selection model of gene-culture coevolution (Bowles and Gintis 2011; Gintis 2011).

If we step back from the polemics, it strikes us that the units of selection debate offers a useful case study on the normative aspects of scientific knowledge construction. Do political commitments mediate acceptance of group selection, as charged by Pinker, Coyne, and Hamilton? If so, is group selection appealing primarily to liberals or conservatives? Do adherents of group selection hold to a “rosier” view of human nature and evolution than their kin selectionist colleagues? Is multilevel selection the new “consensus” among evolutionary scientists or is kin selection still the only “genuinely” scientific game in town?

Our research here is exploratory. We address such questions primarily as an empirical report, though we will offer tentative reflections regarding the findings, some of which surprised us. As will be seen, evolutionary anthropologists roundly reject Pinker’s contention that group selection has no useful role in the social sciences. Moreover, respondents’ politics—and especially their gender—do appear to be implicated in their receptiveness to the idea. We interpret our preliminary data through the lens of political psychology, drawing on the work of Jonathan Haidt (2001, 2012a). We see our research as part of the larger effort to uncover how underlying moral intuitions may shape people’s interpretations of the data. This may be especially the case in politically charged controversies over the basic features of human nature and society.

Background

Units of selection theorizing goes back to Charles Darwin himself, and it is fascinating to see both group and kin

adherents attempt to appropriate Darwin's legacy for their own ends. While Darwin devoted considerable attention to the subject of how natural selection operated on individual organisms and their offspring, he did hypothesize that altruistic behavior could evolve by way of both kin selection (Darwin [1859] 1964) and group selection (Darwin [1871] 1981). He was forced to speculate on such matters to explain the evolution of fitness-reducing traits like sterility and suicidal behavior. Yet he soon realized that the problem "disappears when it is remembered that selection may be applied to the family, as well as the individual, and may thus gain the desired end" (Darwin [1859] 1964, p. 237). These words mark the origins of kin selection (or inclusive fitness) reasoning.

Darwin explained altruism among unrelated humans with a different, group-selection approach. He speculated that altruism evolved within tribes due to its group-level benefits during intertribal conflicts, benefits that had a positive effect for successful groups even while it incurred fitness penalties at the individual level. Darwin ([1871] 1981, p. 134) summed it up in this way: "When two tribes of primeval man, living in the same country, came into competition, if (other circumstances being equal) the one tribe included a great number of sympathetic and faithful members, who were always ready to warn each other of danger, to aid and defend each other, this tribe would succeed better and conquer the other...."

Thus Darwin presented the two hypotheses concerning the evolution of altruism that are still very much debated today. They remain contentious because they seem to imply something about human nature and "goodness" itself: kin selection suggests an ultimately selfish organism, while group selection envisions beings capable of genuine altruism beyond the limits of the family. While over the course of the twentieth century other mechanisms capable of generating altruism have been identified,⁴ none of them provoke the same passions. Yet in the pre-Crick and Watson era, much of evolutionary theory dwelled on the idea of natural selection acting on individuals, and this of course put the spotlight on kinship. "Darwin's Bulldog," Thomas Huxley (1888), was particularly effective in promoting the idea that nature is red in both tooth and claw and that altruism basically extends to family members alone. And all three architects of the Modern Synthesis—Ronald Fisher, John Haldane, and Sewall Wright—evinced understanding of inclusive fitness reasoning in their various pronouncements. Yet the ideas of group selection, and multilevel selection acting at all levels of the biological hierarchy, were not entirely absent. Among early theorists of multilevel selection were August Weismann (1903) and

⁴ Nowak (2011) lists reciprocal altruism, indirect reciprocity, and the effects of population structure.

William Morton Wheeler (1910), who speculated on the concept of the insect colony as a higher-order organism. The famous anarchist Peter Kropotkin chimed in by arguing that altruism could spread throughout a species regardless of kinship pedigrees, and that mutual aid was everywhere in nature, or so he thought. For Kropotkin ([1902] 1989), altruism originated in tribes comprised of both related and unrelated members; kin selection was not at the roots of it all. Huxley's mistake, he thought, was to extrapolate his experiences in overpopulated England to the whole globe. Kropotkin, at home in vast, empty Siberia, saw no evidence for widespread Malthusian dilemmas (Dugatkin 2006).

For Dugatkin (2006), leading scientists have long examined the question of altruism through the prism of their politics and personal biographies. Kropotkin's political sympathies may have made it easy for him to veer towards an expansive view of altruism in nature. The same can be said for Warder Allee (1951), a devout Quaker, who tirelessly promoted the idea that cooperation beyond blood ties, not violence, was the key to understanding life. And might the dedicated leftist Haldane have wanted to demonstrate that natural selection could produce genuine altruism because it coincided with his political sympathies?⁵ Of course, when Haldane presented his model of group selection, William Hamilton showed that the conditions in which it was applicable were pretty limited (Segestråle 2000, p. 58). Yet the concept of group selection was then honed into a book-length presentation by Vero C. Wynne-Edwards (1962) when he argued that among certain bird species, individuals would regulate their rate of reproduction so as not to overtax the group's (or species) resources.

George Williams (1966) famously torpedoed Wynne-Edwards' argument by noting that mutations in each generation would allow selfish reproducers to leave more offspring than the altruists, which would eventually swamp them. Williams' logic, along with William Hamilton's (1963, 1964) expositions on gene-counting theory, which seemed to show that altruism among eusocial insects evolved through kin selection, convinced most evolutionary theorists that group selection was something rare or altogether absent in nature.

Viewing the individual (or the genome) as the target of selection had supporters (e.g., Ernst Mayr). Yet the turn to

⁵ Dugatkin (2006) notes that Haldane was quite good at partitioning his thoughts so that political sympathies tended to not ruin his analyses of evolution. Haldane, incidentally, was a combat veteran in the First World War who enjoyed the opportunity for killing, calling violence "a respectable relic of early man," and took pride in being "the only officer to complete a scientific paper from a forward position of the Black Watch." His coauthor on the paper was killed in action (Dugatkin 2006).

viewing the gene as the fundamental unit of selection and the extended kin group as the mechanism of transmission was perhaps most memorably boosted by Haldane's quip that he would sacrifice his life for two siblings or eight cousins, basing these calculations on the number of genes in common he shared with his relatives (Segerstråle 2000, p. 58). We know that Fisher, Haldane, and Wright stressed the importance of relationship coefficients and their connections to the evolution of altruism but none seemed interested in developing an explicit mathematical model of how this would work. John Maynard Smith (1964) coined the term "kin selection" to neatly characterize how altruism could spread not only by direct transmission of genes to offspring but through altruistic behavior towards collateral relatives. William Hamilton (1964) modified and formalized this logic so that it was not the overall genetic relatedness that mattered but rather the probability that two organisms would share the genes that promoted altruism. Hamilton's (1964) term for this was "inclusive fitness." While kinship is but one way of getting the benefits of altruism to fall on individuals who are likely to be altruists, Hamilton's famous equation $R/b > c$ became widely viewed as a handy device for predicting and explaining altruistic behavior.

In the 1970s, however, some theorists began to reconsider group selection. Richard Lewontin (1970) argued that evolution by natural selection can occur not only with genes but with any entities subject to competition, inheritance, and variation. George Price (1970, 1972) then showed Hamilton that kin selection could be reformulated as a form of group selection via his "Price Covariance Equation." Hamilton's acceptance of this position would be reflected in his own writings when he subsumed both kin and group selection as merely different forms of inclusive fitness (Hamilton 1975). In his own words: "It seems on the whole preferable to retain a more flexible use of the terms; to use group selection where groups are clearly in evidence and to qualify with the mention of 'kin' (as in the 'kin-group' selection mentioned by Brown), 'relatedness' or 'low migration' ... or else, 'assortation' as appropriate" (Hamilton 1975, 1996, p. 337). The mathematics of Hamilton's reformulated notion of inclusive fitness indicated that altruism could spread through a population if altruistic acts were directed at other altruists rather than random members of the population, regardless of relationship coefficients (Segerstråle 2000, p. 133). Even George Williams (1992, 1996) acknowledged the importance of group selection.⁶

⁶ "Even without its producing biotic adaptation, group selection can still have an important role in the evolution of the Earth's biota. The most credible example is the prevalence of sexual reproduction in all the major groups of eukaryote organisms" (Williams 1996, p. xii). Some of our respondents made similar observations in their written commentaries.

The Price equation established that selection for altruism could be accomplished in a variety of ways involving both kin and non-kin. David Sloan Wilson (1975) discussed the circumstances under which group selection would operate even when the altruistic traits conferred lower fitness at the individual level. Building on John Maynard Smith's (1964) "haystack model" of group selection, Wilson outlined how group selection was possible under conditions in which deme members dispersed into subgroups and then reformed for mating purposes.⁷ Anthropologists and ecologists (e.g., Boyd and Richerson 1985; Heinrich, Boyd and Richerson 2008) would join in by formulating theories of cultural evolution wherein symbolically marked groups that punish selfish nonconformists provide the conditions for group selection. Because selection is acting on culture traits and not genes, high rates of intergroup migration do not undermine the process (as it would in genetic group selection). This form of selection came to be known as cultural group selection.⁸

As noted in the introduction, it was the article in *Nature* written by Nowak et al. (2010) that struck a nerve. Briefly, they argued that kin selection reasoning had been discredited as the cause of eusociality among insects. Rather, individual selection in the early stages followed by multi-level selection at the final stage accounted for the phenomena just fine. The criticism they brought to bear on Hamilton's haplodiploid hypothesis was stinging: no eusociality found among the 70,000 or so known parasitoid and other apocritan Hymenoptera, all of which are haplodiploid. Nor is eusociality present in the 4,000 haplodiploid sawflies and horntails. And clonal organisms, with the highest pedigree of relatedness possible, display eusociality in but one group. Meanwhile, various examples of diploid insects displaying eusociality were discovered. Finally, they pointed out selective forces that dampened the social utility of genetic relatedness (e.g., infectious diseases, inbreeding depression, and nepotism-induced intra-group conflict). By reiterating that countervailing selective pressures act through group selection (Nowak, Tarnita, and Wilson 2010, p. 1058), they set the stage for a withering debate reminiscent of the sociobiology controversy of the mid-1970s.

The *Nature* paper, by drawing attention to individual and group selection at the expense of kin selection, drew a

⁷ One respondent commented "I've started reading some of DSW's papers and wasn't clear on what they contributed beyond Maynard Smith."

⁸ Other theorists noted that in bacteria that replicate clonally, the cell, and not the gene, is most properly conceived of as the unit of selection (Lane 2005, pp. 193–196). Facts like this led some theorists to question whether we should privilege one level (the genic) as the fundamental level of selection.

strong reaction from those committed to that paradigm. One hundred and fifty theorists signed a communication to *Nature* defending kin selection and denouncing group selection (Abbott et al. 2010). Internet blogs and newspapers were lit up with criticism of Nowak, Tarnita, and Wilson, (for examples see Dawkins 2012; Pinker 2012). Luminaries such as Helena Cronin, Richard Dawkins, and Steven Pinker lined up in defense of kin selection while noted theorists Robert Boyd, Jonathan Haidt, and Herbert Gintis defended the group selection position (Pinker 2012). Finally, a third faction maintained that group and kin selection were just pragmatic alternatives that could be deployed depending on the circumstances and research interests of the investigator (D.S. Wilson 2012). The magnitude of the debate and criticism is what prompted us to explore this issue.

Methods

We surveyed by e-mail identifiable evolutionary anthropologists (biological/physical anthropologists and human behavioral ecologists) who are faculty members of graduate programs. We utilized the American Anthropological Association's E-Guide (2012) and supplemented it with examination of over 145 anthropology graduate department websites. Through this method, we compiled a list of 681 professors. Of these, we received 175 useable surveys for a response rate of 26 %.⁹ We chose to survey faculty from graduate programs in part because they are directly training tomorrow's anthropologists, and we aim for our research to shed light on the state of the field and its likely direction. Needless to say, we recognize the limits of our data and welcome further investigation of anthropologists in non-graduate programs as well as evolutionists outside the field of anthropology.

The basic demographics are as follows. There are 124 men (71.3 %) and 50 women (28.7 %). The youngest member of the sample is 30, and the oldest is 76. Sixty-two respondents are between the ages of 30–45 (38.7 %), 63 are between the ages of 46–61 (39 %), and 38 are 62 years or older (23.3 %). Seventy-five are full professors (44.6 %), 59 are associate professors (34.5 %), and 35 are assistant professors (20.8 %).

Anthropologists reported solid knowledge of the units of selection debate, with over 50 % claiming "expert" or "substantial" knowledge and 38 % indicating moderate knowledge of the debate. Regarding their graduate school training, 57.5 % of respondents noted that their graduate mentors were "strongly" or "leaning" toward kin

selection, 34.2 % of mentors were "neutral," and 8.2 % were "strongly" or "leaning" toward group selection. It is evident, hence, as we discussed above, that kin selection has been the dominant paradigm in training anthropologists in recent decades.

Our substantive questions can roughly be divided into three categories: (1) respondents' political affiliations and attitudes; (2) their attitudes toward the units of selection debate; and (3) their views on related evolutionary phenomena, such as prehistoric homicide rates. We asked about political attitudes to probe the various but related hypotheses put forward by Hamilton (1996), Coyne (2011), and Pinker (2012) that the more idealist/politicized members of the academy would be more favorable to group selection. These hypotheses differ from one another in that sometimes it is the progressives who are said to favor group selection (e.g., Hamilton 1996) while others draw the link between group selection and conservative ideology (e.g., Coyne 2011; Pinker 2012). In any event, our respondents report that they are predominantly liberal in outlook, with 74.5 % identifying as such. In addition to noting political affiliation, we asked respondents whether they strongly agree, somewhat agree, disagree, strongly disagree, or are neutral with the following statements:

- A future society with minimal differences in resources and power between people is a realistic possibility.
- Generous acts such as giving blood, donating to charity, and the like, are rooted at least in part in a genuine human predisposition to help others, even at expense to oneself.

Regarding attitudes towards units of selection, our initial question is simple: do evolutionary anthropologists agree with Steven Pinker (2012) that "group selection has no useful role to play in social science"? As noted above, Nowak et al. (2010) spurred a firestorm by trumpeting the superiority of multilevel selection in explaining human sociality.¹⁰ And the idea of cultural group selection merits attention because, in theory, it may have played a greater role in shaping human sociality than genetic group selection. Hence, we asked our colleagues the extent to which they agreed or disagreed with the following units of selection statements:

¹⁰ Some respondents felt that we had set up an artificial dichotomy by opposing kin selection to group selection. We did so in light of how Nowak et al. (2010) framed the issue in the original paper. As for suggestions by some respondents that we should have framed the study in terms of group selection versus gene selection, we considered that also, but ultimately followed Jablonka and Lamb's appraisal that "today's theories of group selection are as gene-centered as any other models of natural selection, including Hamilton's explanation of altruistic traits" (Jablonka and Lamb 2005, p. 37).

⁹ Note that the data reported in the paper may leave out an incidental number of missing cases.

- Group selection has no useful role to play in social science.
- The era of debate over “group selection versus kin selection” has passed.
- Most of the important questions regarding selection can be addressed within either framework.
- Multilevel selection is superior to kin selection in explaining sociality among humans.
- Group selection fails to make an appropriate distinction between replicators and vehicles.
- Cultural group selection is an important process in human social evolution.
- Realistic examples of group selection in nature are hard to find.
- D. S. Wilson’s model of trait group selection is a plausible way that group selection may occur in nature.
- The logic of natural selection can and should be applied to cultural phenomena.
- In-group bias is an example of prepared learning.

Finally, we add a few questions on intergroup conflict as a driving force in cultural group selection. We thought that the familiar emphasis on tribal violence in the literature may suggest different political standpoints. Hence we asked respondents if they agreed with the following assertions:

- Tribal conflict was a principal selective force that shaped human nature.
- Tribalism is a fundamental human trait.
- Available evidence suggests that homicide was quite rare in prehistoric hunter-gatherer societies.

Such questions let us explore if there is any link between political idealism and notions of a peaceful, prehistoric past. We should note that some strong proponents of kin selection (such as Hamilton) had dark, Hobbesian views of human nature in which warfare was thought to be pervasive. Yet if tribal warfare is believed to have been a major driver of cultural group selection, how would that state of affairs provide comfort to the idealists?¹¹ We will return to this question below, particularly with regard to gender, which turns out to be significantly correlated with views on prehistoric violence.

¹¹ Some respondents in the survey also wondered about this in their written comments. As one put it, “There does seem to be a perception that group selection is a more liberal (leftist) view, but this is baffling to me given that the primary mechanism of group selection in humans is generally thought to be warfare—whereas the position that warfare was rare in prehistory is also perceived as a left-leaning view.” Perhaps those with gentler views of cultural group selection envision predator avoidance, communal breeding, or self-domestication scenarios.

Results

In the tables that follow we provide a concise quantitative display of our findings. Table 1 shows summary statistics for gender, political orientation, and the survey items.

Looking at Table 1, we find that evolutionary anthropologists reject Pinker’s contention that group selection has no useful role to play in the social sciences. The respondents contend that in the case of human sociality, multi-level selection is the preferred framework, and we see them supporting the importance of cultural group selection. We reiterate that most evolutionary anthropologists were trained by mentors who preferred kin selection, and as a general rule the respondents continue to display this preference. Yet even given these backgrounds and preferences, they still see a crucial role for group selection.

In Table 2 we highlight the significant associations between gender, political affiliations, and beliefs concerning units of selection. We employ ordinary least squares regression in examining coefficients for six independent variables—gender, level of expertise, liberal and conservative self-identification, mentor orientation, and number of years holding a PhD. Our independent variables of interest are gender and political affiliation, with the other variables operating as controls. Note that liberals are significantly more likely than conservatives to disagree with the notion that tribal conflict was a principal selective force that shaped human nature. Conservatives, however, are significantly more likely than liberals to view tribalism as a fundamental human trait. Conservatives are also more likely to disagree with the assertion that homicide was quite rare in prehistoric hunter-gatherer societies.

Table 2 also highlights the effects of gender on beliefs about units of selection. We point out that what we perceive to be of greatest immediate interest are the findings that female respondents have significantly higher resistance to (1) the idea that tribal conflict was a principal selective force, and (2) the idea that available evidence suggests that homicide was common in prehistory. At the same time, female scholars have a higher resistance to the notion that tribalism is a fundamental human trait ($p < 0.10$).

Discussion and Conclusion

Evolutionary anthropologists weighed in decisively against Pinker’s contention that group selection has no useful role to play in the social sciences. Despite finding that most anthropologists were trained by mentors largely sympathetic to kin selection and despite having two-thirds of anthropologists admitting viewing kin selection as the more important framework overall, a full 80 % of respondents disagree with Pinker’s assertion concerning

Table 1 Summary statistics

Independent measures			
	% Male	% Female	N
Gender	70.8	29.2	171
Dependent measures			
	% Agree	% Disagree	N
Future egalitarian society possible	20.9	79.1	139
Multilevel superior to kin for human sociality	55.5	45.5	119
Group selection misidentifies replicators and vehicles	19.3	80.7	145
Homicide was quite rare	15.2	84.8	125
Group selection has no utility	35.1	64.9	128
Culture group selection important	78.7	23.1	127
Tribal conflict is a selective force	56.6	43.4	122
Tribalism is a fundamental human trait	72.0	28.0	125
Group selection examples hard to find	58.7	41.3	143
Generous acts point to genuine altruism	78.1	21.6	139
Either framework works	34.4	65.6	125
Trait group model is plausible	63.3	36.7	90
Era of debate has passed	30.2	69.8	126
Natural selection applicable to culture	70.8	29.2	144
In-group bias is prepared learning	82.1	17.9	67
Attitude to Approaches			
	% Kin	% Group	N
	65.6	34.4	96

Table 2 OLS regression results for three dependent measures

Independent variable	Homicide rare		Tribal conflict		Tribalism	
	β	<i>p</i> value	β	<i>p</i> value	β	<i>p</i> value
Female	0.335	0.041	-0.415	0.015	-0.259	0.087
Expert	-0.551	0.012	0.168	0.255	0.403	0.064
Liberal	0.091	0.316	-0.610	0.001	-0.219	0.134
Conservative	-1.050	0.027	0.662	0.112	0.824	0.050
Mentor strongly kin	-0.375	0.020	0.644	0.000	0.377	0.021
Years as PhD	-0.006	0.175	-0.006	0.208	-0.019	0.004
Constant	2.421	0.000	3.516	0.000	3.877	0.000
<i>N</i>	154		159		155	
<i>Adjusted R</i> ²	0.111		0.161		0.098	

the disutility of group selection. Moreover, 79 % of respondents state that cultural group selection is an important process, and a majority (55 %) goes so far as to maintain that multilevel selection is superior to kin selection in explaining sociality among humans. Clearly, evolutionary anthropologists envision a role for group selection, it just seems that “the devil’s in the details.”

This leads us to the connection of politics with selection as posited by Coyne, Hamilton, and Pinker. As previously stated, Coyne and Pinker expect conservatives to be attracted to group selection, while Hamilton expects progressives to be so. The survey results indicate

that political affiliations do indeed mediate aspects of the units of selection debate. Just as Hamilton contended, liberals were more likely to prefer multilevel selection as an explanation for human sociality. Liberals were also much less likely to regard tribal conflict as a principal selective force. These findings lend support to the widely held belief that liberals differ from conservatives in their conceptions of human nature. Yet no association was found between political preferences and belief in the possibility of an egalitarian future or in belief in genuine altruism, findings that have us temper our conclusions.

Finally, conservatives were much more likely to assert that the issue had been settled: the era of group selection versus kin selection had passed.

The findings demonstrate widespread differences of opinion based on gender, and we are surprised by the extent that this is so. Males display a significantly greater acceptance of tribal conflict as a principal selective force shaping human nature. Men also differ significantly from women in their assessment of the evidence on prehistoric homicide. Specifically, they are much more likely than women to reject the claim that homicide was rare in prehistory. Finally, males are more likely to view tribalism as a fundamental human trait.

How should we make sense of these provocative findings? Although this is primarily an empirical report, let us suggest some tentative interpretations of these differences of opinion among evolutionary anthropologists. To begin with, disagreements should be expected due to the general intractability of the problem. If we were simply trying to determine which of two medicines worked best against, for example, ringworm, a few trial studies would likely clear things up pretty quickly. But our research problem is trickier: anthropologists want to know how an ancestral species of primates living in small kin-based societies evolved into a species in which widespread cooperation among strangers was common. A few quick trial studies will not solve this problem. We are instead in the arena where much of what is of relevance reveals itself to be “inference to the best explanation” or plausibility arguments (Richerson and Boyd 1987).¹²

Richerson and Boyd (1987) make the point that modeling strategies vary in emphasis regarding, among other things, generality and simplicity. Kin selection theory, as a heuristic, places the spotlight on relationship coefficients. Modern theories of cultural group selection isolate phenomena such as moralistic punishment and conformist social learning. Other group selection models focus on aggregation and segregation cycles. Yet none pretends to capture all the nuances of the evolutionary process, which would require attention to such things as sexual selection and much more, including epigenetic inheritance through mechanisms such as DNA methylation and RNA interference (Richerson and Boyd 1987; Jablonka and Lamb 2005; Nowak 2011).¹³ The lesson seems to be this: don’t confuse a model of reality with reality itself.

¹² Critics might prefer to call them “just-so stories.”

¹³ One approach that received some positive reviews in the commentary section was the one developed by George Price (1970, 1972). One respondent put it this way: “The formalism of the Price equation lends itself to a hierarchal expansion that provides a principled framework for studying ‘group selection.’ The Price equation is also easily modified to create the essential features of Hamilton’s law, as laid out by Hamilton (1975). I don’t care what you

Perhaps a brief comparison with early developments in quantum theory might clarify the matter. Despite the differing interpretation of quantum mechanics, physicists agreed (and continue to agree) on the math. That is to say, Erwin Schrödinger’s “Schrödinger equation” was quickly revealed to be the mathematical equivalent of Werner Heisenberg’s already existing “matrix mechanics.” For practical reasons (direct bias?), the Schrödinger equation came to be more widely used because it was far simpler. Likewise, some of the respondents in the current survey suggest that kin selection is the simpler model to employ. What physicists quickly came to disagree on was the interpretation of experimental results.

In a similar manner, evolutionary anthropologists, as near as we can tell, are not arguing about the math. Again and again in our survey respondents took the time to point out that mathematically, kin selection and group selection amount to the same thing.¹⁴ Instead, they are in disagreement about ontology: that is, which selective pressures in the environment matter, and what are their effects upon genes, individuals, genetic relatives, and groups.

To continue with the physics/biology comparison: did the Copenhagen Interpretation represent the “zeitgeist” of 1920s postwar Germany? We are doubtful. One could just as easily argue that making sense of the bizarre observations derived from quantum experiments would necessarily invoke counterintuitive ideas. For what it’s worth, we doubt that kin selection evokes the zeitgeist of the 1960s.¹⁵ Nor are we inclined to view multilevel selection as a reflection of the current spirit of the times. Instead, we see the reception of these theories among anthropologists perhaps hinting at the operation of *social intuitions* in the scholarly community.

Our own thoughts on the matter run along these lines. First, it strikes us that beliefs about altruism, human nature,

Footnote 13 continued

call it. It’s about positive covariance between fitness and phenotype and this can arise through a variety of mechanisms. Do I think that the conditions for evolution by group selection are likely to be common in nature? Probably not, but I am open to the idea.”

¹⁴ One respondent left the following comment about the math behind the models that readers may find of interest: “This would be much less controversial if the people who claim to be evolutionary biologists actually understood the mathematics and population biology that underlies evolutionary theory. I am continually shocked at how little understanding there is out there. Everyone cites Hamilton (1964) but no one reads it. No one in my cohort of evolutionary anthropologists appears to realize that Hamilton’s rule is based on Hardy–Weinberg ratios and thus does not apply to alleles under selection. He supported Price and in a little cited paper (Hamilton 1975) he noted that the Price equation was the way to deal with the problem of altruism.”

¹⁵ One respondent to our survey framed it more colorfully: “Lot’s of ... self important cultural anthropologists will argue that natural selection is a neoliberal logic of production (blah, blah, blah).”

and homicide cannot help but provoke moral intuitions. In this regard, we find particularly helpful Jonathan Haidt's (2001, 2012b) social intuitionist model of moral judgment. This model posits that moral judgments are largely based on automatic processes (our "moral intuitions") instead of conscious reasoning. This is a slightly attenuated version of David Hume's ([1739] 1978, p. 414) "reason is the slave of the passions" argument, with the proviso that emotion is but one type of intuition.¹⁶ For hot-button topics like human nature it is easy for intuitional snap judgments to guide further theorizing, and oftentimes conscious thought serves as little more than a post hoc rationalization (Haidt 2001, 2012b). Hence our survey, which has to do with people's variable capacity for cruelty and altruism and the tribal roots of human nature, is a tailor-made environment for social intuitions to run rampant. Dugatkin (2006, p. 10) captures our view nicely:

Very few people have their own theories about how the insect eye evolves, but almost everyone has his or her own ideas on why humans are or are not altruistic. These ideas are often spawned from philosophy, religion, and politics, but sometimes arise solely from gut feelings about why we are the way we are. And, of course, scientists too have their philosophical, religious, and political views, and they are not immune from the influence of such ideas on their scientific work; particularly when the questions being studied have, by their very nature, implications for philosophy, religion, and politics.

For some, our survey results may do little to enhance confidence in the "objectivity" of social scientific investigations of controversial questions. Yet we believe that social intuitionism offers a useful language to start unpacking the cognitive-emotional underpinnings of our disagreements, especially as they relate to ideology and identity. Viewed from this perspective, the results suggest that conflicting appraisals of evidence by anthropologists may reflect classic group behavior, as academics gravitate (often unconsciously) towards colleagues with kindred underlying moral intuitions. If this view is correct, we may have a case not only of confirmation bias but of social persuasion, as anthropologists within particular "emotive communities" reinforce their shared interpretations of evidence.¹⁷

In this light, let's proceed with interpretation of the significant gendered differences in the understanding of the

archaeological record as it pertains to homicide. In the space provided for comments, only 12 respondents elaborated on the subject. Most of their comments were moderate. Comments like "I know our samples are limited and biased," "Evidence is lacking either way," and "there is no good evidence for/against such a general statement" all appear. Some made qualifications, e.g., "If it includes intergroup killing I disagree, if not, I agree." One comment caught our attention: "Depends on whether we're talking about small-band hunter-gatherers (rare) or complex hunter-gatherers (potentially common); the question is whether there were any monopolizable resources to kill others over! There were always females, sure, but that would have led to intragroup homicide more than intergroup homicide."

Consider the finding that female anthropologists are significantly less likely to be convinced of evidence for widespread homicide in prehistory. Given the state of research, we don't see an obvious *evidentiary* basis for preferring the pacific versions of the past as presented by scholars such as Brian Ferguson (2011) and Sarah Hrdy (2009) over more violent theories. For example, Richard Wrangham and Dale Peterson (1996) present a more violent theory of "demonic males" that may be as plausible as Hrdy's gentler "communal breeding" hypothesis. The disagreements between Hardy and Wrangham fall outside of the conventional parameters of the kin versus group selection debate (though both have done extensive research in the kin selection tradition), yet their theories of ultrasociality among humans are almost certainly well known to most respondents. Key concepts in Hrdy's explanation include *alloparenting*, *matrilineal descent*, and *cooperation*. Key concepts in Wrangham and Peterson's thesis include *patriarchy*, *patrilineal descent*, *war*, and *out-group enmity*. We can't help but wonder if questions pertaining to prehistoric homicide and tribal conflict draw attention to the Wrangham/Hrdy disagreements and may even serve as "primers" much in the way Haidt envisioned. Consider the number of female scholars (e.g., Jane Lancaster, Kristen Hawkes, Beatrice Whiting) who along with Hrdy have contributed to the general building of the communal breeding case. A similar cluster of male scholars (Raymond Dart, Napoleon Chagnon, R. Brian Shaw, and Yuwa Wong) developed the "warfare was pervasive" school of prehistory. Are both male and female anthropologists appraising the evidence and committing to respective theories from the standpoint of their social intuitions? On this issue, we believe perhaps so.

Although females are more likely to accept cultural group selection as a process, they display significantly higher levels of resistance to the most commonly proposed selective pressure invoked in such scenarios: tribal conflict. We can only speculate about the reasons. Perhaps there is a parallel with the "Man the Hunter" debates that took place

¹⁶ Haidt (2012b) would like to substitute "intuitional" for "emotional" in the title of his own, earlier Haidt (2001) paper, "The Emotional Dog and its Rational Tail."

¹⁷ Haidt (2001) stresses the role of social persuasion as a key link in his model.

over 40 years ago, when a predominantly male cohort of anthropologists promoted a “male hunting” vision of prehistory that did not find women’s activities to be of much theoretical interest. A number of female scholars painstakingly filled in the gaps, presenting a much more balanced vision of hunter-gatherer economics. Let us close by reiterating that our interpretation of the evidence thus far is largely speculative. Further research is needed into whether woman and men differ systematically in their moral intuitions. Curiously, we found no significant difference between male and female anthropologists in our sample in their professed political affiliations. Hence, moral intuitions may act under the radar of political categories that have different degrees of salience for different people. We see this report as part of a larger project (Horowitz et al. 2014) attempting to examine the normative dimensions of knowledge production across the sciences. The significant differences of opinion displayed between both liberals and conservatives and male and female scholars have left us looking forward to further empirical studies on the role of politics and gender in the sciences. Our hope is that scientific progress on the vital question of human nature can be enhanced by a better grasp of the emotional underpinnings of our biases.

Acknowledgments We thank Catherine Amy Frazier and Karen Pimentel for their research assistance and help in preparing this manuscript.

References

- Abbott P, Abe J, Alcock J et al (2010) Inclusive fitness theory and eusociality. *Nature* 471:E1–E4
- Allee W (1951) *Cooperation among animals with human implications*. Henry Schuman, New York
- American Anthropological Association E-guide (2012) <https://avec.tra.aaanet.org/ewb/>. Accessed 12 April 2012
- Bowles S, Gintis H (2011) *A cooperative species: human reciprocity and its evolution*. Princeton University Press, Princeton
- Boyd R, Richerson P (1985) *Culture and the evolutionary process*. University of Chicago Press, Chicago
- Coyne J (2011) Big dust up about kin selection. <http://whyevolutionistrue.wordpress.com/2011/03/24/big-dust-up-about-kin-selection/>. Accessed 28 Nov 2013
- Darwin C (1964) *On the origin of species*. Harvard University Press, Cambridge (Orig. 1859)
- Darwin C (1981) *The descent of man, and selection in relation to sex*. Princeton University Press, Princeton (Orig. 1871)
- Dawkins R (1976) *The selfish gene*. Oxford University Press, Oxford
- Dawkins R (2012) The descent of Edward Wilson. *Prospect*. <http://www.prospectmagazine.co.uk/magazine/edward-wilson-social-conquest-earth-evolutionary-errors-origin-species/#.UNQHvxAXWAo>. Accessed 28 Nov 2013
- Dugatkin LA (2006) *The altruism equation*. Princeton University Press, Princeton
- Ferguson RB (2011) Pinker’s last stand: exaggerating prehistoric war mortality. In: Fry D (ed) *War, peace, and human nature: the convergence of evolutionary and cultural views*. Oxford University Press, Oxford, pp 113–131
- Ghiselin MT (1974) *The economy of nature and the evolution of sex*. University of California Press, Berkeley and Los Angeles
- Gintis H (2007) A framework for the unification of the behavioral sciences. *Behav Brain Sci* 30:1–15
- Gintis H (2011) Gene–culture coevolution and the nature of human sociality. *Philos Trans R Soc B* 366:878–888
- Gintis H (2012) On the evolution of human morality. *Edge.org*. <http://edge.org/conversation/the-false-allure-of-group-selection#dq>. Accessed 31 July 2013
- Gintis H, Henrich J, Bowles S et al (2008) Strong reciprocity and the roots of human morality. *Soc Justice Res* 21:241–253
- Haidt J (2001) The emotional dog and its rational tail: a social intuitionist approach to moral judgment. *Psychol Rev* 108: 814–834
- Haidt J (2012a) Religion, evolution and the ecstasy and self-transcendence [Video file]. http://www.ted.com/talks/jonathan_haidt_humanity_s_stairway_to_self_transcendence.html. Accessed 28 Nov 2013
- Haidt J (2012b) *The righteous mind: why good people are divided by politics and religion*. Pantheon Books, New York
- Hamilton W (1963) The evolution of altruistic behavior. *Am Nat* 97:354–356
- Hamilton W (1964) The genetical evolution of altruistic behavior I & II. *J Theor Biol* 7:1–52
- Hamilton W (1975) Innate social aptitudes of man: an approach from evolutionary genetics. In: Fox R (ed) *Biosocial anthropology*. Wiley, New York, pp 133–153
- Hamilton W (1996) *Narrow roads of gene land*. Vol. 1: evolution of social behaviour. Freeman, New York
- Heinrich J, Boyd R, Richerson P (2008) Five misunderstandings about cultural evolution. *Hum Nat* 19:119–137
- Horowitz M, Yaworsky W, Kickham K (2014) Whither the blank slate? A report on the reception of evolutionary biological ideas among sociological theorists. *Sociol Spectr* 34:489–509
- Hrdy S (2009) *Mothers and others: the evolutionary origins of mutual understanding*. Harvard University Press, Cambridge
- Hume D (1978) *A treatise of human nature*. In: Selby-Bigge IA (ed) Clarendon Press, Oxford (Orig. 1739)
- Huxley T (1888) The struggle for existence: a programme. *Ninet Century* 23:165–168
- Jablonska E, Lamb M (2005) *Evolution in four dimensions: genetic, epigenetic, behavioral, and symbolic variation in the history of life*. MIT Press, Cambridge
- Kropotkin P (1989) *Mutual aid*, 3rd edn. Introduction by George Woodcock. Black Rose Books, New York (Orig. 1902)
- Lane N (2005) *Power, sex, suicide: mitochondria and the meaning of life*. Oxford University Press, Oxford
- Lewontin RC (1970) The units of selection. *Annu Rev Ecol Syst* 1:1–18
- Maynard Smith J (1964) Group selection and kin selection. *Nature* 201:1145–1147
- Nowak M (2011) *Supercooperators: altruism, evolution, and why we need each other to succeed*. Free Press, New York
- Nowak M, Tarnita C, Wilson EO (2010) The evolution of eusociality. *Nature* 466:1057–1062
- Pinker S (2012) The false allure of group selection. *Edge.org*. <http://edge.org/conversation/the-false-allure-of-group-selection#dq>. Accessed 31 July 2013
- Price G (1970) Selection and covariance. *Nature* 227:520–521
- Price G (1972) Extension of covariance selection mathematics. *Ann Hum Genet* 35:485–490
- Queller D (2012) Two languages, one reality. *Edge.org*. <http://edge.org/conversation/the-false-allure-of-group-selection#dq>. Accessed 31 July 2013

- Richerson P, Boyd R (1987) Simple models of complex phenomena. In: Dupre J (ed) *The latest on the best: essays on evolution and optimality*. MIT Press, Cambridge, pp 27–52
- Seegerstråle U (2000) *Defenders of the truth: the sociobiology debate*. Oxford University Press, Oxford
- Weismann A (1903) *The evolution theory*. Edward Arnold, London
- Wheeler WM (1910) *The ant-colony as an organism*. A lecture prepared for delivery at the Marine Biological Laboratory, Woods Hole, MA, 2 August
- Williams G (1966) *Adaptation and natural selection: a critique of some current evolutionary thought*. Princeton University Press, Princeton
- Williams G (1992) *Natural selection: domains, levels and challenges*. Oxford University Press, Oxford
- Williams G (1996) *Adaptation and natural selection: a critique of some current evolutionary thought*. Princeton University Press, Princeton
- Wilson DS (1975) A theory of group selection. *Proc Natl Acad Sci USA* 72:143–146
- Wilson DS (2012) Richard Dawkins, Edward O. Wilson, and the consensus of the many. <http://www.thisviewoflife.com/index.php/magazine/articles/richard-dawkins-edward-o.-wilson-and-the-consensus-of-the-many>. Accessed 28 Nov 2013
- Wilson EO (2012a) *The social conquest of earth*. Norton, New York
- Wilson EO (2012b) Interview conducted by Charlie Rose. <http://www.youtube.com/watch?v=j4Ltmy4DvNg>
- Wrangham R, Peterson D (1996) *Demonic males: apes and the origins of human violence*. Houghton Mifflin, New York
- Wynne-Edwards VC (1962) *Animal dispersion in relation to social behavior*. Oliver and Boyd, Edinburgh