The demise of group selection

The idea that adaptations in organisms result from "group selection" (selection among groups that differentially bud off subgroups, with those having good "group traits" becoming more numerous), rather than from selection among genes themselves, usually within individuals, has undergone a bit of resurgence in popular culture. This is in stark contrast to the views of most evolutionary biologists, who see group selection as a logical possibility, but one that doesn't easily work in theoretical models and, more important, has explained almost nothing about nature. In contrast, the gene-centered view of evolution worked out by biologists like W. D. Hamilton, Robert Trivers, and John Maynard Smith, and popularized by Richard Dawkins, has been immensely fruitful.

I've posted a lot on the intellectual vacuity of group selection, particularly its failure to explain the evolution of traits like human altruism and cooperation (see, for example, here, here, and here). If you want an elegant and easily digestible explanation of the weaknesses of group selection, Steve Pinker has just published a nice essay on John Brockman's Edge website, "The false allure of group selection." If you're interested in seeing three smart biologists take group selection apart, there's an excellent paper by West, Griffin, and Gardner (reference below), which you can download for free here (the paper is not too hard, and the meat extends from pp. 376, beginning at "Error 3: the new", to p. 379, bottom of Table 2).

There are several reasons why group selection has waned in popularity among evolutionists:

- Group selection is a fuzzy and nebulous concept that is far less coherent than is gene-level selection (see Pinker’s essay for an explanation)

- As I said above, when group selection does work in theory, it can be shown to be mathematically equivalent to gene-level selection involving "inclusive fitness." But the group-selection scenarios are far more unwieldy, and are often so complex that they can't be modeled. As West et al. note:
  
  1. "No group selection model has ever been constructed where the same result cannot be found with kin selection theory."
  2. "The group selection approach has proved to be less useful than the kin selection approach."
  3. "The application of group selection theory has led to much confusion and time wasting." It is, as the authors say, "easy to misapply, leading to incorrect statements about how natural selection operates," it is "not distinct from kin selection", and it "often leads to the confusing redefinition of terms and the use of confusing jargon."

- There are formidable theoretical problems with many concepts of group selection. These include the fact that individuals reproduce faster than groups, so that an adaptation that is good for groups (say, pure altruism, in which individuals sacrifice their reproduction through behaviors that bring no benefits to the genes producing such behaviors), won't spread because the rate of propagation of groups is undermined by the evolutionary disadvantage of altruistic behaviors within groups (non-altruists, or "cheaters," will replace the altruists
since they get the benefits without the costs). In other words, altruistic groups may do better than non-altruistic ones, but that won’t produce species-wide altruism because non-altruists do better than altruists within groups—unless, of course, altruists aren’t “pure” altruists and their genes reap some benefit from the behavior, in which case it’s kin selection.

- While logically and theoretically possible, when group selection does work it can be shown to be equivalent to gene-level selection, usually acting through interactions between individuals. It is thus more fruitfully modeled—and explained—by gene- and individual-centered explanations that often involve “inclusive fitness” (IF). IF is the idea that genes can gain a benefit not just by increasing the reproductive output (“fitness”) of individuals themselves, but via the interaction of those individuals with relatives or members of their group who carry the same genes. Human “altruism,” for example, is explained more parsimoniously by kin-selected IF models or other gene-centered approaches like reciprocal altruism (“I’ll scratch your back if you’ll scratch mine”)—or, in primates, by the notion that “altruistic” acts actually increase fitness by giving a good reputation to the altruist. Further, the data from nature show that the way altruism and cooperation operate in animals is more consistent with their evolution by gene- and individual-level selection than by group selection (see here for an explanation).

- Finally, I am not aware of a single adaptation in nature that can be explained better by group selection than by kin selection. (A single possible exception is the evolution of sexual reproduction, but we still know very little about how sex evolved.) In contrast, as the West et al. paper notes (see Table 1), as well as several responses to a 2010 Nature paper by Nowak et al. dissing kin selection, kin-selection theory and its underlying concept of inclusive fitness have been immensely fruitful in understanding the evolution of social behavior. It is kin selection and not group selection that has helped us understand things like sibling conflict, sex ratios in social insects and parasites, parent-offspring conflict, and genomic imprinting. Group selection has had no such success. A stark example of the impotence of the group-selection approach is given by West et al. (p. 378):

  ...[W. D.] Hamilton’s original model has been extended in numerous directions to match the biology of particular organisms, allowing more specific tests of theory (Frank, 1998; West et al., 2005). This allows us to quantify the relative use of the group selection and kin selection approaches, by examining the relative frequency with which these methods led to new areas of theory that could be empirically tested. We have performed this, and found that in 15 of 15 cases, it was kin selection theory that was used (Table 2; P = 0.00006, two-tailed sign test). Sex-ratio theory therefore provides clear statistical support for the usefulness of kin selection over group selection.

So if group selection is so intellectually and scientifically unproductive, why do we hear so much about it? I think there are two reasons.

First, its few proponents make a lot of noise. And those proponents include well-known scientists like Martin Nowak, E. O. Wilson, David Sloan Wilson, and Jon Haidt. Nowak, Tarnita, and Wilson published a big (and deeply faulty) paper in Nature asserting that group selection was a better explanation than kin selection for “eusociality”: the social system of animals, like bees and ants, that have sterile “castes” of workers that divide up colony labor, and have one or a few fertile queens tended by those workers. (For links, see my post on the scientific community’s rejection of that paper.) E. O. Wilson has incorporated many of these erroneous ideas into a new book, The Social Conquest of Earth, that will, because of his prominence, be widely read by the public. (I hasten to add that his other biological work has usually been superb.) Wilson’s book has not received much acclaim from scientists: it’s been severely criticized, for example, by Steven Mithen in The New York Review of Books and by Richard Dawkins in Prospect. I’ll be weighing in on the book later.
Jonathan Haidt, a well-known psychologist with a wide public following, has also pushed group selection in his new book *The Righteous Mind*. I’ve previously discussed his problematic TED talk on the book and his penchant for group-selection explanations of religion and human cooperation here.

The problem with all this is that the arguments for group selection are being made in books aimed at the general public, but the critical responses by evolutionary biologists are not only buried in technical papers, but involve arcane scientific arguments that sometimes use (horrors!) mathematics. So while group selection may flourish in the public mind, it’s moribund to most evolutionary biologists who have followed the technical debates in the literature.

Second, people want to believe in group selection. That doesn’t just include scientists like D. S. Wilson, who has made it his life’s mission to defend the concept, but, more importantly, the general public. 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. Such a notion is deeply appealing to those who have a dislike for the idea of the “selfish gene,” mistakenly conflating that notion with the idea of selfish individuals. As all evolutionists know, or should know, cooperation and altruism can evolve via selfish genes!

Nevertheless, the idea of group-level adaptations has an innate appeal to those with a penchant for the religious and the spiritual. Why, just this morning the unctuous Krista Tippett (why do people listen to her?) interviewed D. S. Wilson on her “On Being” show on National Public Radio. The topic was Wilson’s attempts to improve his own city of Binghamton, New York using evolutionary principles of group selection. Last year, in a review of Wilson’s book *The Neighborhood Project* in *The New York Times*, I strongly criticized his evolutionary-based sociology.

So while group selection is moribund among evolutionary biologists and many evolutionary psychologists, the criticisms of the idea are buried in the technical literature while its vocal proponents write best-selling books. Behind much of this is the insidious Templeton Foundation, which has for some reason decided to promote group selection, probably because of its religious and spiritual connections and its link to “goddy” things like altruism and cooperation. Both D. S. Wilson and Martin Nowak, for example, are heavily funded by Templeton. And Jon Haidt not only was funded by two Templeton grants (here and here), but they also funded a sabbatical semester for him to write a book in 2003. Plus he won the Templeton Prize for Positive Psychology in 2001. (I guess there’s no prize for Negative Psychology.)

With all that money and all those megaphones behind it, the idea of group selection persists in the public mind while slowly dying in the scientific community. Yes, it’s dying, but it refuses to lie down.

It might be helpful to provide a link to Nowak et al. itself, so that people can judge for themselves just how deeply flawed it is. Or are we, perhaps, assumed to be unable to do that?

Ken Pidcock
Posted June 24, 2012 at 9:17 am | Permalink

It might be helpful to provide a link to Nowak et al. itself, so that people can judge for themselves just how deeply flawed it is. Or are we, perhaps, assumed to be unable to do that?

Reply

whyevolutionistrue
Posted June 24, 2012 at 9:24 am | Permalink

Look, there's no need to be snarky; I simply forgot the link, but I've added it now.

Take a grumpy pill this a.m.?

Reply

Ken Pidcock
Posted June 24, 2012 at 10:14 am | Permalink

I apologize for my impertinence, but it has been my perception that too much of the discussion on this topic has excluded reference to what, specifically, those authors were saying.

Reply

whyevolutionistrue
Posted June 24, 2012 at 10:18 am | Permalink

Umm... if you check my previous discussions on this topic (see references given in the post), you'll see that I not only link to what I'm discussing, but summarize what it says.

Reply

tryangregory
Posted June 24, 2012 at 12:16 pm | Permalink

The title of the West et al paper is not (as cited above) “Social semantics: how useful has group selection been?” it is “Social semantics: altruism, cooperation, mutualism, strong reciprocity and group selection”

Reply

whyevolutionistrue
Posted June 24, 2012 at 12:37 pm | Permalink

Sorry! I put in a link to the wrong paper. I've now fixed it, and thanks for the alert.

–C.C.
tryangregory  
*Posted June 24, 2012 at 12:20 pm | Permalink*

Here's the link to the paper with the title cited above:

http://www.life.umd.edu/faculty/wilkinson/BIOL608W/WestGriffinGardner_08.pdf

Reply

tryangregory  
*Posted June 24, 2012 at 12:21 pm | Permalink*

(The current link is to a different paper, with the title "Social semantics: altruism, cooperation, mutualism, strong reciprocity and group selection".)

Reply

James Sweet  
*Posted June 25, 2012 at 7:41 am | Permalink*

A related nitpick:

And those proponents include well-known scientists like Martin Nowak, E. O. Wilson, David Sloan Wilson, and Jon Haidt. Nowak, Tarnita, and Wilson published a big (and deeply faulty) paper in *Nature*

In the second sentence, I know you are talking about E.O. Wilson, but since you mentioned both him and D.S. Wilson in the previous sentence, it is confusing. 😐

Reply

2. sciencebulldog  
*Posted June 24, 2012 at 9:48 am | Permalink*

Forgive my ignorance as I try to wrap my head around this fascinating discussion of group vs. kin selection. It seems to me that with kin selection you always have a "direct" connection to lineage, while in group selection you do not. Thus over time natural selection can "process" kin as genes are directly passed down, while groups are not likely to be connected over a sufficient amount of time for this to occur. The inherit noise in differing groups over time would outweigh most gradual selection effects that would be able to continue through the genetic lineage of kin. Does this make sense or am I way off? I still am reading up on the topic.

Reply

3. Ken Pidcock  
*Posted June 24, 2012 at 9:59 am | Permalink*

Here's a very good and concise defense of inclusive fitness theory, specifically against Nowak et al.

Is species selection not a form of group selection? It does seem to be the case that when a whole species goes down, perhaps due to the invasion of its range by a competitor or predator, even the best adapted genotypes within in it are going to disappear too. Passenger pigeons all went away under heavy shooting pressure in a few decades. There apparently wasn’t time for natural selection to create a new model better adapted to the changed conditions — despite the probability that some were more wary, quicker, or more tolerant of small group size. Likewise, in a major crisis (e.g., Permian organic crisis) whole clusters of species and larger clades can be wiped out regardless of the influence of normal gene-based selection. Why can’t selection operate at multiple levels, at least sporadically?

Surely there can be selection among species, and among ‘groups’, by reason of group-level properties. E.g., major environmental change always selects for dispersers and opportunists. But these group-level properties are not transmitted with high fidelity (if any) to descendant groups, unless they are actually expressions of genetic alleles whose behaviour is best described by individual and kin selection.

Two quick comments.

1) The idea that group selection and kin selection are mathematically equivalent is false. The persistence of this idea is really amazing since it doesn’t even make sense intuitively. See van Veelen “Group selection and kin selection are not mathematically equivalent” (2012) Journal of theoretical biology, for what should be (but won’t be) the end of that idea.
2) Group selection can work just fine even if groups survive for much longer than one generation of individuals before "budding" or "fissioning". Does anybody know where this idea originates? It isn't even close to being true. There are some new animations of solutions of the dynamical equations for two-level population processes posted on youtube

This should prove that groups can live much longer than individuals without preventing group selection.

There are other problems with Jerry’s post, but these are two that stand out because they are such common misconceptions.

Reply

Occam
Posted June 24, 2012 at 11:44 am | Permalink

Could you please post the equations, or generally accessible links to them? Thanks.

Reply

Cooperator
Posted June 24, 2012 at 12:11 pm | Permalink

Here’s a paper that’s already published

There’s newer stuff that’s probably better. Send me an email for more info. Jerry gets mad when I blow my horn on his website 😞

Reply

Ryan
Posted June 24, 2012 at 12:12 pm | Permalink

Here is a response to the van Veelen paper and others that I believe is open access.

Cooperator
*Posted June 24, 2012 at 1:23 pm | Permalink*

Yes, I’ve seen this. It doesn’t address van Veelen’s points at all. Just another essay on the Price equation, which is the source of most of the confusion on the issue. The Price equation does not properly characterize group selection.

Reply

whyevolutionistrue
*Posted June 24, 2012 at 12:35 pm | Permalink*

PLEASE do not embed videos in the comments!

Reply

Cooperator
*Posted June 24, 2012 at 1:11 pm | Permalink*

Sorry, I thought I was just posting the url.

Reply

Bob Carlson
*Posted June 24, 2012 at 5:39 pm | Permalink*

In another WEIT thread I had pasted a YouTube URL, and it showed up as an embedded video. I expected that it was because the software had been designed that way.

Reply

Daniel
*Posted June 25, 2012 at 12:14 am | Permalink*

Testing the following three strings as a single line:

http://

http://www.youtube.com

/watch?v=jm3dm5J5r0A
Reply

Daniel

Posted June 25, 2012 at 12:15 am | Permalink

Yep, it's automatic. Just posting the url is enough to embed the video.

What about as a link?

Reply

Daniel

Posted June 25, 2012 at 12:17 am | Permalink

There we go.

Linking to youtube videos as `<a href="url">links</a>` is hunky-dory, but just posting in the url as text will embed the video.

Test complete.

Reply

Torbjörn Larsson, OM

Posted June 24, 2012 at 5:00 pm | Permalink

Maybe it is just me, maybe it is the idea that Templeton fund group selection, but from a superficial comparison (group selection pay walled, kin selection open source) Coyne's kin selection ref and your group selection ref say exactly the same thing:

"The neighbor-modulated-fitness and levels-of-selection approaches are mathematically equivalent. For example, in the context of the evolution of altruism, altruists suffer a within-group disadvantage (Cov (w /w¯ , z Fi) ! 0) J ij ij due to exploitation by their more selfish social partners and enjoy a group-level advantage (Cov (w /w¯ , z ) 1 0) due I i i to their altruism, which might under some conditions give a total advantage for altruism (Cov (w /w¯ , z ) 1 0). The ij ij
neighbor-modulated fitness will reflect any tendency for altruistic individuals to associate with other altruists such that the benefits of socializing of altruistic neighbors might outweigh the immediate costs of altruism, to derive a net fitness benefit. This is the basis of the kin selection approach, with the association between social partners being described by the kin selection coefficient of relatedness. Thus, there is an equivalence between group selection and kin selection; they are the same process (Hamilton 1975; Wade 1985; Frank 1986b; Queller 1992; Dugatkin and Reeve 1994; Wenseleers et al. 2003; Foster et al. 2006)."


"However, a crucial point here is that the generality of Hamilton’s rule is possible only because of the subtlety of its component terms, in which potentially complicated details are implicit. The same caveat applies to Price's theorem, from which Hamilton’s rule has been derived. This means that Hamilton's rule and Price's theorem should generally be used in the interpretation of theory and not as the starting points in the analysis of specific problems, because this can easily lead to mistakes (Price 1970, 1972; Taylor and Frank 1996; Frank 1998; Pen and Weissing 2000; Gardner and West 2004c)."

[p 224, ibid.]

"Abstract

It is often suggested that any group selection model can be recast in terms of inclusive fitness. A standard reference to support that claim is "Quantitative genetics, inclusive fitness, and group selection" by Queller (1992) in the American Naturalist 139 (3), 540-558. In that paper the Price equation is used for the derivation of this claim. Instead of a general derivation, we try out a simple model. For this simple example, we find that the result does not hold. The non-equivalence of group selection and kin selection is therefore not only an important finding in itself, but also a case where the use of the Price equation leads to a claim that is not correct.

If results that are arrived at with the Price equation are not correct, they can typically be repaired by adding extra assumptions, or explicitly stating implicit ones. We give examples with relatively mild and with less mild extra assumptions. We also discuss why the Price equation is often referred to as dynamically insufficient, and we try to find out what Price's theorem could be."

["Group selection and inclusive fitness are not equivalent; the Price equation vs. models and statistics", van Veelen et al, 2012.]

Ref A: Group selection and kin selection is equivalent by way of the Price equation in theory. However, using them on models are fraught with problems because of implicit details.

Ref B: Group selection and kin selection is equivalent by way of the Price equation in theory. However, using them on models are fraught with problems because of implicit details.

The difference is that ref A notes that this makes them the same process in theory absent dynamics, while ref B wants to make Price equation as absent dynamics.

Potayto, potahto!?
To avoid being implicit myself, I am of course interpreting van Veelen et al “can typically be repaired” as saying that the “not correct” result will be that there is a “recast” after reparation.

Blame the paywall, this is the best interpretation I can do here.

---

Cooperator

The problem with the Price equation and the “mathematical equivalence” result is this:

The form of the Price equation used in the "proofs" of equivalence do not allow group level events, i.e., the number of groups is implicitly assumed to be fixed. So the equivalence result doesn’t really apply to interesting and potent kinds of group selection. And what van Veelen showed is that even in the special cases of two-level population processes where the Price equation is valid, the result still isn’t true in general.

---

efctony

Is there anywhere that explains these equations at all? Somewhere that, at least says what "cov", i and j are? Or, better, like Yudkoswky’s explanation of Bayes theorem?

Or, would anyone like to write one?

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RF

I would assume that "cov" is short for "covariance", and i and j are indices.

---

Davros

I thought that the criticism was not that kin and group selection were mathematically equivalent, but that they could both be used to predict the same things. Given that they can both be used to make the same predictions and group selection is often far more complicated and always less general, occam’s razor should lead us to prefer kin selection.
Cooperator
Posted June 24, 2012 at 9:50 pm | Permalink

I think the idea that they are equivalent is responsible for a lot of the confusion, and if and when researchers realize that they are not, they will probably take a fresh look at other assumptions too. So it’s a good place to start. I can’t agree with your second sentence. They don’t make the same predictions because they are apples and oranges. They don’t apply to the same set of modeling assumptions. And I would disagree on which is more complicated. Actually, keeping track of relatedness variables is very difficult. That’s why there are no dynamical models of kin selection.

Reply

Davros
Posted June 25, 2012 at 6:34 am | Permalink

You’re right, my second sentence does not convey the meaning I intended. I meant that both group and kin selection models both successfully predict the evolution of things like altruism. But, kin selection can also be used to predict the evolution of other things, like parent-offspring conflict. And, regardless of complexity, we should still prefer the generality of kin selection. But, from what I have gather from following the debate, extra complexity is a frequent criticism of group selection. Indeed, it’s a point made in the West, Griffin and Gardner article Jerry cites. For example, from their conclusion "However, from a practical point of view, it could not be clearer that the kin selection approach is the more broadly applicable tool that we can use to understand the natural world. This is because kin selection methodologies are usually easier to use, allow the construction of models that can be better linked to specific biological examples, lend themselves to empirical testing and allow the construction of a general conceptual overview."

Reply

7. bestss
Posted June 24, 2012 at 10:59 am | Permalink

A false idea relentlessly and shamelessly promoted becomes "fact."

Paradoxically, the lie of group selection is immoral in it’s campaign of spreading a falsehood.

Lies in the service of "morality!?

Reply

8. riffingreligion
Posted June 24, 2012 at 11:19 am | Permalink

It’s been a while since I read any of the proponents of group selection, but I recall it making little sense for genetic traits, while seeming more plausible when tackling cultural traits. It’s at least more plausible than "memes", which I see as a failed attempt to treat cultural evolution as a direct analogue of biological evolution. A priori,
there's no reason to think that the explanation for why Christian churches proliferated while other contemporary religions like Manicheanism languished in obscurity should have to be the same as the genetic explanation of how Homo sapiens spread across the world while other Homo species died out.

None of this is to say that group selection in cultural evolution is right. It still has many of the same problems (defining the unit of selection, for example). But given that the mechanisms of cultural evolution are still very poorly understood (unlike biological evolution), I wouldn't rule it out. Of the serious proposals for cultural evolution that I've heard, group selection is not the most unlikely (again, that would be memes).

Reply

John Scanlon, FCD
Posted June 27, 2012 at 9:09 am | Permalink

Really? You think it's far more likely that cultural motifs, beliefs, and practices evolve by

(A) the differential survival and 'reproduction' of whole human 'groups' (whatever those are), rather than

(B) the differential copying (by actual apes) of actual motifs, beliefs and practices?

Or are you using 'group selection' and 'memes' in a sense I'm unfamiliar with?

Reply

Group selection seems to arise to explain seemingly maladaptive traits like altruism or senescence. But group selection absolutely is not necessary if you have recessive gene. Traits, like sickle cell disease can be maladaptive for some, but beneficial for individuals with only one copy. If altruism were like sickle cell disease we would not need group selection to explain it. Those with one copy of the gene would not be terribly altruistic and would not decrease their fitness significantly. Those with two copies would be altruistic, and though their fitness might suffer, the allele for altruism would thrive in those with only one copy, who would be aided in survival by their altruistic brethren. So long as the heterozygotes had improved survival over those without the allele in the gene pool, the allele would take off.

Reply

That's just a weaker version of kin selection. I don't see that it adds anything new.

Reply

A catastrophe happens so intensely or so rapidly that no members of
a population survive. When this happens, the previous pre
catastrophe variation in fitness of individuals is rendered irrelevant.

11. caf
   Posted June 24, 2012 at 11:59 am | Permalink
   Dr. Coyne and Readers:
   Have any of you seen this article in Sunday Times (London):
   http://www.bryanappleyard.com/not-in-our-genes/

12. emmageraln
   Posted June 24, 2012 at 12:42 pm | Permalink
   Reblogged this on emmageraln.

13. chascpeterson
   Posted June 24, 2012 at 2:24 pm | Permalink
   Here’s another recent review that has been recommended to me:
   The group selection controversy
   E. G. LEIGH Jr
   Journal of Evolutionary Biology Volume 23, Issue 1, pages 6–19,
   January 2010
   abstract
   pdf

14. billswift
   Posted June 24, 2012 at 3:51 pm | Permalink
   I think one reason people keep trying to "justify" group selection in
   biology is faulty analogies between biological and social evolution.
   Not only does group selection work in social evolution, but social
   evolution is Lamarckian in that it retains acquired traits. So you need
   to be careful when reasoning from one to another.
   Repeated with editing from a Less Wrong thread from last April,

15. Torbjörn Larsson, OM
   Posted June 24, 2012 at 3:54 pm | Permalink
   A concerted effort, surely:
The Guardian The Observer:

"Richard Dawkins in furious row with EO Wilson over theory of evolution

Book review sparks war of words between grand old man of biology and Oxford’s most high-profile Darwinist”

Bad equivocal article by Vanessa Thorpe, letting readers reactions weigh in while dismissing expert opinion (Dawkins list!) for what seems to be a geneticist (Koentges).

So ... Templeton, huh? Should’ve expected that!

Reply

Torbjörn Larsson, OM
Posted June 24, 2012 at 4:01 pm | Permalink

I can’t tie Thorpe to Templeton, but she has certainly written encouragingly on their prayer research.

Reply

Dominic
Posted June 25, 2012 at 1:51 am | Permalink

Yes – I was amazed to read that, & she is NOT a science writer – Arts & Media!

Reply

Btw, don’t know if it fits best here under evolution of under Harris on death, but this was just in over at Guardian:

Lonesome George has just died of "unknown causes".

That was one "group" that was selected. :-/

Reply

Tom Clark
Posted June 24, 2012 at 6:43 pm | Permalink

Thanks for keeping the group thinkers at bay. Group selectionists such as Haidt and D.S. Wilson argue that since we’ve been group-selected to be predisposed to be religious, we should encourage religion as a way to build group cohesion and social capital, http://www.naturalism.org/enlightenment1.htm#religion . This of course plays into the hands of the religious right and conservative moral foundations as described (and now defended) by Haidt. But we don’t need to believe in falsehoods to generate common cause and solidarity, given the challenges facing humankind, http://www.naturalism.org/enlightenment1.htm#extending

Reply

PB
The “human eusociality” (as Wilson says it) may be an interesting idea, not necessarily supporting group selection. Study of human groups and social norms (morality, inclusivity etc) is interesting and necessary branch of science.

And as in physics, there are atomic theories and organic chemistry, then in humanities we could have genes at the microscopic scale, and economics, nationalism, ideology at the larger scale.

No actual conflicts. Both are important and necessary.

Do not let these arguments become part of the ideological warfare between templetonians and science. Too bad.

Reply

18. davidgerard
Posted June 25, 2012 at 12:28 am | Permalink

Suggestion: a detailed exposition on the Templeton backing for the idea. This deserves wider exposure.

Reply

19. ethologist
Posted June 25, 2012 at 5:15 am | Permalink

E.O. Wilson has a post on The Stone at the NYTimes:

In it he refers to the response to the Nowak et al article:

"A strong reaction from supporters of kin selection not surprisingly ensued, and soon afterward more than 130 of them famously signed on to protest our replacement of kin selection by multilevel selection, and most emphatically the key role given to group selection. But at no time have our mathematical and empirical arguments been refuted or even seriously challenged. Since that protest, the number of supporters of the multilevel selection approach has grown, to the extent that a similarly long list of signatories could be obtained."

Sounds like game over, doesn’t it?

Reply

20. TJR
Posted June 25, 2012 at 5:32 am | Permalink

Pinker’s article mentioned above is very good, and suggests that this is yet another argument where half the problem is ambiguous terminology, with people using slightly different definitions of the terms “natural selection” and “group selection”.

Reply

21. stevenjohnson
Having recently read The Better Angels of Our Nature, it is dismaying to see Steven Pinker cited as an authority. Professor Pinker managed to construct graphs on the rate of change in rates of homicide over the centuries without discussing systematic sampling errors; without discussing possible significance (indeed, not really justifying!) focus on Europe/North America; without discussing the meaning of homicide rates in periods of whole depopulation; redefining homicide to exclude not just war, but infanticide. There were so many other questionable choices in that book a mere listing would be a major writing project, but only a fool doesn't write for money. A dubious authority weakens the case.

Here are a couple of notes on natural language, first, that "kin" is not a gene, but a group. Inclusive fitness informally speaking is then a well established form of group selection, even in the restricted sense of altruism as purely sacrificial.

Second, if an altruistic trait is necessarily sacrificial, then for an organism it is a trait that is naturally selected against. In ordinary language, the great achievement of natural selection on organisms is to explain perfection of adaptations without a designer, by wholly natural means. Such an apparent violation of perfection by sacrificial altruistic traits really does seem to require a special term for a more complex working out of the basic principle of natural selection, analogous to the way sexual selection explains how natural selection can produce seemingly nonadaptive traits.

Is it not possible that a lot of this is about trying to unpack apparent political implications. In that Pinker article, he tried to talk about people adapted to manipulate others being the cause of sacrificial altruism. I suppose this fits his evolutionary psychology's ideological thrust. But I don't understand how manipulability, a sacrificial trait, could not be selected against. The thesis seems to presuppose the greater reproduction of sacrifical altruistic traits, the thing Pinker is arguing against in group selection!

Looking at Wikipedia (JAC is cited by the way,) I noted that John Maynard Smith worked out what he called a haystack model, then dismissed it as unrealistic. The haystacks are obviously unrealist, but substitute bands or villages or simply demes for haystacks, is it still simply unrealistic?

Reply

gbjames
Posted June 25, 2012 at 5:46 am | Permalink

Here are a couple of notes on natural language, first, that "kin" is not a gene, but a group. Inclusive fitness informally speaking is then a well established form of group selection, even in the restricted sense of altruism as purely sacrificial.

Reading this it strikes me that you don't really understand the subject. These sentences don't make sense.

Reply

stevenjohnson
Posted June 25, 2012 at 7:04 am | Permalink

Pretending not to understand is a way of dismissing an argument without confronting it. I hope that's not the case. So...

Inclusive fitness is a special case of kin selection. “Kin”
means a particular kind of group. Inclusive fitness is a special case of a particular kind of group. Inclusive fitness is well established. A special case of a particular kind of group selection is well established. The specialness of inclusive fitness is sacrificial altruism. Sacrificial altruism means the organism is actively harmed by the altruism.

All of the foregoing is written in more or less normal language, except 1.) Sentence structure is uniformly subject/verb/object. 2.) There are no dependent clauses. 3.) The assumption that the reader knows inclusive fitness is a special case of kin selection is explicitly stated. I’m not a professional writer but I don’t think the original sentences were really hard to understand. The clarified version seems rather verbose, dry and a shade condescending. Or was it that I didn’t understand your sentences were really one sentence: “You just don’t understand.”

Possibly so, but that’s not going to enlighten me. I consider JAC an authority but then he cites Pinker, a dubious thinker in previous work, in a citation that doesn’t seem to be as clearly thought out as represented.

Reply

gbjames
Posted June 25, 2012 at 7:16 am | Permalink

The fact that you are unclear in your prose does not mean that I am pretending to not understand. Sentences that are impossible to decipher indicate a certain lack of clarity of thought.

It has been many years since I studied kin selection in graduate school, but I do remember enough to have my BS detector go off when reading statements like "'kin' is not a gene, but a group". At minimum it is a straw man. More probably it just reflects confusion.

Reply

stevenjohnson
Posted June 25, 2012 at 4:11 pm | Permalink

The observation that in ordinary language "kin" means a certain kind of group is not a misrepresentation of someone’s position for the sake of easy refutation. That would be a straw man. At worst, this fact might be a red herring. Confusing these shows a certain lack of clarity of thought.

Incidentally, then attributing the statement to confusion contradicts yourself, since a straw man argument and confusion are not on some bizarre spectrum or scale or whatever nazy notion your have. My BS detector tells me "straw man" was meant to insinuate dishonesty and "confusion" was meant to pose as generosity while actually being condescending. Not bothering to compare the clarification and the supposedly sense free sentence tells my my BS detector was right the first time.

Your BS detector however has plainly been exhausted. Citing Steven Pinker, who is
actually a linguist, in a controversy on evolution? CLANG!

The upshot is now I have to take the time and trouble to read Wilson, whom I haven’t taken seriously outside of entomology for year.

**Reply**

gbjames
Posted June 25, 2012 at 6:41 pm | Permalink

Since nobody I know of is pitching the idea that “kin is a gene”, arguing against it is a pretty good example of a straw man argument, assuming that is what you were doing. Hard to tell because the alternate, “confusion” (meant to describe precisely that) is a reasonable alternate possibility.

**Reply**

**22. bizygomatic**
Posted June 25, 2012 at 7:42 am | Permalink

This is shameless self-advertising but I can't help thinking that my recent paper in PsychScience would be a good intuition primer on this topic. It doesn't really answer any questions but it offers a view on the central problem in groups, that of the free-rider or cheater. What I found was that more physically dominant men are more likely to exploit others when in direct competition BUT, and this is the kicker, when you prime group rivalry, these same men are more self-sacrificing for their groups than anyone else. Why do they behave both ways? Self-interest baby, self-interest... The dominant men gain within group prestige and protect their environment by being 'altruistic' in this way. As I said, this data doesn't really prove anything about selection but I think it is a good intuition primer.

http://pss.sagepub.com/content/early/2012/05/21/0956797611435133

Also, facial dominance is evolutionary relevant:

**Reply**

**23. Marvol**
Posted June 25, 2012 at 11:04 am | Permalink

I know it is anecdotal (possibly the plural of anecdote does become 'data' though*), but for instance I recently saw a video on YouTube of an African buffalo taking on a rhino. While the buffalo gets butchered, its team mates just stand around doing buggerall. The buffalo dies after that. If the whole *group* would have ganged up on the rhino, none would have died. [find it, it's pretty good]

Of course this makes perfect sense in a gene-centered world, where no buffalo-genes are present that are willing to sacrifice themselves for a set of *other* genes. OTOH if group selection has any merit, why can't we see it there – at all?

*This is of course repeated in every 'predator v group' attack, where you hardly ever see the group defend unless family bonds are
involved.

Reply

24. RF

Posted June 25, 2012 at 10:43 pm | Permalink

“While logically and theoretically possible, when group selection does work it can be shown to be equivalent to gene-level selection, usually acting through interactions between individuals.”

That statement assumes that all variation can be explained through genes (an assumption that is not true). And once you’ve assumed that, the statement that all evolution can be reduced to gene-level selection is tautologically true.

Also, isn’t any phenotypical analysis of evolution a form of group selection, in that the phenotype is a group of cells, and that group is being selected?

Reply

5 Trackbacks/Pingbacks

1. By Group selection and Jerry Coyne « Mathematical Biology on June 24, 2012 at 9:57 am

[…] Jerry A. Coyne continues to express his opinion on the group selection concept in his blog. […]

2. By Zombie Ideas of Various Kinds…. « blueollie on June 24, 2012 at 1:49 pm

[…] help that sometimes the popular press does a bad job of reporting the state of various sciences. Here Jerry Coyne points out that the professional biology community has considered “group sele… and pretty much discarded it, even though the pop-science world is keeping the idea […]

3. By If you are going to disuss science.....know some science first, ok? « blueollie on June 25, 2012 at 4:25 am

[…] Jerry Coyne started a discussion on the concept of "group selection" in evolution; his point is that this idea has been considered and dismissed by the community of professional evolutionary biologists. […]

4. By How not to do science journalism: the Guardian screws up the group … | The Journalism Site on June 25, 2012 at 11:20 am

[…] As I noted yesterday, the scientific debate is technical, arcane, and often mathematical. It’s hard to convey to the public, but it can be done. But the Guardian has screwed it all up in its new piece, “Richard Dawkins in furious row with E. O. Wilson over theory of evolution” (subtitle: “Book review sparks war of words between grand old man of biology and Oxford’s most high-profile Darwinist”). It was written by Vanessa Thorpe. […]

http://whyevolutionistrue.wordpress.com/2012/06/24/the-demise-of-group-selection/
5. By Browsing Catharsis – 07.04.12 « Increasing Marginal Utility on July 4, 2012 at 5:01 am

[...] Here are some answers to questions on group selection I asked yesterday. Via Toban Wiebe. [...]