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Some JEB commentaries on group versus kin selection



Ever since I read [The Selfish Gene](#), I've been wondering what exactly group selection could bring to the table of theoretical population genetics that kin selection could not. Every case of group selection observed in nature that I read about turned out to involve groups of individuals that have a higher-than-average relatedness within their group (compared to the rest of the population). So why are the group selectionists still going strong?

A recent exchange of commentaries in the *Journal of Evolutionary Biology*, all free access, seemed like they could go some way to answering my question. They started out with West, Griffin and Gardner [putting forth](#) a new classification system for social behaviours, particularly those that are broadly regarded as 'altruistic'. They devote one section of their paper towards ironing out the 'semantic confusion' created by the group selection literature. First, they distinguish the 'old' and 'new' group selection theories. The old one, associated with Wynne-Edwards, treated the group as the only level of selection — behaviour that was 'for the good of the group' is selected for, and groups were selected at the expense of **other groups** — selection was **interdemic**. The 'new' group selection, in contrast, involved **intrademic** selection: it considered small groups of individuals that had mutual interactions, and showed that cooperative behaviour within those small groups could be favoured. West et al put it this way:

the new group selection approach looks at the evolution of individual characters in a group structured population, whereas the old group selection approach looks at the evolution of group characters

West et al point out that the 'old' group selection works under only extremely restrictive conditions. The 'new' group selection, on the other hand, can be interpreted as kin selection — group-selectionist and kin-selectionist descriptions of it are mathematically identical. The implicit suggestion is that there is no point in keeping the group-selectionist description: why not leave everything to kin selection and individual selection?

Unsurprisingly, prominent group selectionist David Sloan Wilson objects to the above account of group selection. Strangely, his [reply](#) involves a lengthy recap of the history of group selectionist ideas. Less strangely, he uses the catch-phrase 'pluralism' all the time.

Wilson doesn't try to deny that every plausible case of group selection discovered so far can be reinterpreted as kin selection. He maintains, however, that group selection has brought new insights to population genetics, citing the examples of population viscosity and human cooperation. In particular, he claims that group selectionist perspectives were important in originating modern lines of research on those two issues.

In their [reply](#) to Wilson's commentary, West et al concede that group selection made a pioneering key contribution to models of population viscosity. Their comeback, however, is that later approaches using kin selection models were able to provide analytical proofs that Wilson's group selection approach could not. On the issue of whether the effect of local competition can be overcome by dispersing in small groups ('buds'), they point out that kin selection models have managed to provide a solution with just "a few lines of algebra", whereas group selectionists had long lamented that the problem was too mathematically complicated.

In response to Wilson's charge that group selectionist perspectives provided new insights into human cooperation, West et al have a similar reply: briefly, that group selectionist approaches have not been able to derive analytical solutions where kin selectionist approaches were able to. They further charge that on this issue, "the group selection approach has failed to clarify the underlying selective forces, and has led to confusion". They believe that kin selection better isolates these 'underlying selective forces'. For example, kin selection has demonstrated that "punishment or strong reciprocity are not alternative evolutionary explanations for cooperation, as had been implied, but merely specific mechanisms for providing direct or indirect fitness benefits to cooperation" — these 'fitness benefits', rather than the punishment or strong reciprocity in themselves, are the 'underlying forces' of selection.

As I'd hinted at earlier, I was uncomfortable with Wilson's heavy citation of history in his defence of group selection. For even if group selection has *historically* been a pioneering approach to many issues in evolutionary biology, it doesn't follow that it's still worth keeping around as an alternative approach. To show the latter, you really have to bring up examples of issues in which group selection has produced results that kin selection has not been able to. And it seems that West et al have responded admirably to Wilson's examples by countering with kin selectionist approaches to them that have not just matched but bettered group selectionist approaches.

It probably reflects my physicist-bias that I also find West et al's argument that group selection should be dropped for reasons of theoretical unification persuasive. It seems that *some* element of above-average relatedness between cooperators is always present in successful group selection scenarios. The natural move is then to isolate *this* element as 'underlying' group selection, which is exactly what kin selection does. And even on an instrumental level, kin selection seems to beat group selection. Sure, there was a time when group selection had its nose ahead of kin selection on certain issues. But many abandoned scientific theories also at some point or another were the 'leading' approaches in their field. We should embrace pluralism only if it's going to be useful to us *now*.

WEST, S.A., GRIFFIN, A.S., GARDNER, A. (2007). Social semantics: altruism, cooperation, mutualism, strong reciprocity and group selection. *Journal of Evolutionary Biology*, 20(2), 415-432. DOI: [10.1111/j.1420-9101.2006.01258.x](https://doi.org/10.1111/j.1420-9101.2006.01258.x)

WILSON, D.S. (2007). Social semantics: toward a genuine pluralism in the study of social behaviour. *Journal of Evolutionary Biology* DOI: [10.1111/j.1420-9101.2007.01396.x](https://doi.org/10.1111/j.1420-9101.2007.01396.x)

WEST, S.A., GRIFFIN, A.S., GARDNER, A. (2007). Social semantics: how useful has group selection been?. *Journal of Evolutionary Biology* DOI: [10.1111/j.1420-9101.2007.01458.x](https://doi.org/10.1111/j.1420-9101.2007.01458.x)

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