

1. Can evolutionary transitions happen in both directions and what happens if we go backwards, not forward?
2. Was the basic early driver warfare, or was it the struggle for survival in a harsh environment (also a form of competition between groups)?
3. You suggest that "the primary mode of competition ... was warfare." I am not so sure that other processes, such as disorganized occupation of territory for survival, forced migration without fighting, etc. played a major role. Warfare, of course, is the one best-documented.
4. Agree about warfare perhaps not being an initial driver. That raises the question of when in history it arose. My guess would be around 10K ago.
5. My guess regarding the rise of warfare as a driver is that when the first villages formed a division of labor arose between the better hunters and the agricultural workers, leading to a hierarchical structure arising in which the hunters also became defenders.
6. If group selection is a form of multilevel selection, can we assign a dimension value to it that is related to the number of levels?
7. Do your results on the spread of large scale societies replicate in the Americas? What percent of variance could be explained by an alternative model of diffusion (slow on land, faster on sea/rivers)?
8. (a) - What do you think of Yuval Harari's Evolutionary History work (e.g. the book `Sapiens' 2015).
(b) - Would it be possible, using your agent-based model system, to use the theory of CMLS, regarding how *Homo sapiens* (maybe?) wiped out / warred against, the 5 (or so) other contemporary species of humans/*Homo* approximately 50k years ago (e.g. the Neanderthals, *Homo floresiensis*, Denisovans, etc) ?
9. What's your view on the work of David Wengrow & David Graeber on social complexity?
10. Is there a systematic reason why you do not ask for decreasing size of polities after the 1940s? What is it about yardstick competition in which often small states like Singapore or Norway are role models?
11. With governance, you start with all the societies as points on an 11-dimensional hypercube. It's not obvious to me that summing the dimensions is the best way to collapse this onto 1 dimension. Do the societies appear to fall on some small subset of the full hypercube?
12. Is linear regression enough to explain the complexity of evolution in multiple systems and multiple scales?
13. Was the average size of foraging bands constant over time before agricultural communities emerged? Is there evidence of warfare causing an increase in the size of foraging bands before agriculture emerged?

14. Regarding the negative relation between government size and territory, does this potentially change or is it affected by the speed of information transmission?

15. How might your model account for alternative forms of polities that don't necessarily rely on formal bureaucracy (or evidence of bureaucracy no longer survives), such as nomadic confederations/empires? And might a database that looks only at the rise of states be blind to understanding the range of human experiments in governance, including paths not taken?

16. Is the argument that at a certain time hunter/gatherer groups came into increased conflict with each other, which increased the intensity of inter-group warfare?

17. How does the database take into account differences in governance within the same polity, like differences between metropole regions and frontiers?

18. Is it possible that competition is not required for biological or cultural evolution? Darwin pointed out that 'struggling against the drought' is not competition. Lewontin's (1970) often-used description of selection explains that competition is not needed. If competition were only one type of evolutionary driving force, would it change anything in your models?

19. Have you thought of treating natural disasters (major volcanic eruptions causing crop failures, years without summer, etc.) as natural experiments?

20. Any comments on the NY Times article on civilization collapse that presented your views, but also critics and alternatives?

21. How do you think about the ability to control spread of biological contagion? As population grows, the risk of pandemic disease increases. Are there societal structures that reliably do better or worse at containing the spread of disease (in the absence of antibiotics)?

22. How do you deal with the difference between absence of evidence and evidence of absence - a particular problem for the earlier archaeological (and sometimes historical) record?

23. It seems like the dynamics of cultural macroevolution are much different today compared to the period you've gathered data on (ancient to medieval). Are you interested in prediction, and if so could you elaborate a bit on the applicability of your conclusions to the modern world?

24. Did the black death stress society more profoundly than any war?

25. From your discussion, it seems to me like governance evolved to conquer rather than as a solution to human challenges. What is that driving ideology that has kept the evolution of governance?

26. Considering the complexity of your causal relationships of interest: How did you come up with the correct (presented) model specification? (e.g. I was surprised to not see any interaction effects.)

27. This might be a bit tangential, but I've always wanted to ask Peter what he thought of the premise of cliology in the science fiction novel *In The Country Of the Blind* (it inspired my PhD). More to the point, can this area of research not only help us to understand, but as The Evolution Institute has it, to improve the human condition?

28. Nowak's equations on evolutionary cooperation include: Kin, Direct Reciprocation, Indirect Reciprocity (reputation), Network Recip. (neighbors), Group Selection (benefit/cost = $1 + (\text{max group size} / \text{number of groups})$). 1) Frame for Kinship & Reciprocal Altruism? 2) Group selection seems to select for smaller group elites. Any thoughts?
29. Do you think the rise of large-scale governments was inevitable? Is there something about human nature that causes human populations of a certain size to create polities? Or is it more of an intellectual endeavor / creation?
30. Is economic productivity measured in your database? Isn't creation as important as destruction of stuff?
31. You mentioned the importance of transmission of memories. Did you test this?
32. Your data suggest wars (or preparations for them) look like a major engine of human/social evolution. But common sense is to avoid wars (even arms races) by any means as a major destructive factor of human/social development.
33. How far can one push the analogy between biological and cultural evolution? Can one go beyond basic concepts like selection, competition and cooperation to more mechanistic principles?
34. Shouldn't the doctrine of mutually assured destruction make warfare as a selection mechanism unviable for the future?
35. How can cooperation be introduced to your models? It seems like a weak assumption to remove the evolved cooperative human nature when asking about the evolution of human societies.